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A VIBRANT RURAL ECONOMY – THE CHALLENGE FOR BALANCE

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AGRICULTURE IN TASMANIA AND IRELAND – WHERE ARE WE HEADING?

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Abstract

Ireland and Tasmania are similarly sized islands with a strong dependence on agricultural exports. Beef and dairy products are the main agricultural exports from Ireland, while beef, dairy products, sheep meat and wool, and processed vegetables are the main agricultural products exported from Tasmania.
The pressures facing agriculture in Ireland and in Tasmania are similar:

- *Increasing pressure on prices while costs rise.*
- *Greater focus on the safety, quality, nutritional and convenience aspects of food products, as well as the environmental and ethical issues associated with production of food and fibre.*
- *Competition for rural land primarily for rural lifestyle benefits, rather than for agricultural use, with the costs of farming land increasing significantly.*

This paper examines and compares how farmers in Ireland and Tasmania are responding to these pressures. The current response is primarily to increase productivity, per hectare and per labour unit. However, in the longer term more diverse solutions will be necessary.

Backgrounds

Ireland and Tasmania are similarly sized islands at similar latitudes (Ireland 52-55 degrees North, Tasmania 40-43 degrees south) and with similar climates (Temperate Maritime). Around 4.3 million hectares are used for agriculture in Ireland, and 1.6 million hectares in Tasmania (see Table 1). However, the main agricultural landuse in Ireland is grass production for beef and dairy cattle, with a small amount of cropping and a very small area of forestry. Tasmanian agriculture is more diversified with pastures for sheep, beef and dairy cattle, and cropping (particularly for vegetables).

The total value of agricultural output is considerably higher in Ireland than in Tasmania (€4,962m compared with €514m) due to a larger area of agricultural land, higher values for produce, and greater productivity per hectare. However, Ireland and Tasmania are both highly dependent on export markets.

Table 1: Comparative statistics, Ireland and Tasmania

	Tasmania	Ireland
Areas of land: Total area (ha) Agricultural use (ha) Forestry use (ha)	6.8m[1] 1.6m 1.7m	6.9m[2] 4.3m 0.7m
Number of farms:	4,300	135,300[2]
Average size (ha):	382	32.3
Total value of agricultural output: Tasmania, at "farm-gate prices" Ireland, at "producer prices"	€514m[3]	€4,962m[4]
Land values, €/ha	€1,500-€24,000	€16,230
Dairying: Average herd size Gross output at farm gate/producer prices % Agricultural Output	275 €160m 21%	49 €1,332m 27%
Beef: Cattle no's ('000s) Gross output at farm gate/producer prices % Agricultural Output	450[1]	6,200 €1,403m 28%
Sheep: Total sheep ('000s) Gross output at farm gate/producer prices % Agricultural Output	3,200 Wool €46m Wool 9%	4,260 €192m 4%
Total livestock slaughterings: Gross output at farm gate prices % Agricultural Output	€122m 24%	
Cereals: Area ('000 ha) Gross output at farm gate/producer prices % Agricultural Output	23 €10m 2%	276 €125m 3%
Potatoes: Area ('000 ha) Gross output at farm gate/producer prices % Agricultural Output	9 €55m[3] 11%	12 €166m[5] 3%
Horticulture (fresh fruit & vegetables): Gross output, farm gate/producer prices (€m) % Agricultural Output	€48m 9%	€219m 4%

[1] Rural Land Use Trends in Tasmania, 2003. November 2003. Davey & Maynard Agricultural Consulting
[2] Fact Sheet on Irish Agriculture, October 2006. Economics and Planning Division, Department of Agriculture and Food.
[3] The Contribution of Agriculture to the Tasmanian Economy. September 2005. Report prepared by Davey and Maynard for the Tasmanian Agricultural Productivity Group and Tasmanian Farmers & Graziers Association.
[4] Fact Sheet on Irish Agriculture, October 2006. Economics and Planning Division, Department of Agriculture and Food.
[5] Includes other root crops such as sugar beet

Financial assistance from public funds is much lower in Tasmania than in Ireland; around €100m compared with €3,259m[6]. Public funding is proportionally much greater in Ireland than in Tasmania, though it is not proposed to discuss that issue further in this paper.
Agriculture in Ireland is the basis of the rural economies; this is also the case in Tasmania. Agriculture provides the funds necessary to sustain the rural environment and the rural communities, with associated benefits to tourism in particular. There is little secondary industry in the rural areas of Ireland and Tasmania, apart from some mining, forestry and fishing in several areas of Tasmania, and fishing in Ireland.

The main agricultural industries and their current status, trends, challenges and proposed responses are discussed below.

Dairy Industry

Dairying is a very important agricultural industry in Ireland and Tasmania. Both are strongly dependent on export markets, where they are global competitors.

Dairying In Ireland

The Irish dairy industry is primarily based on grass feeding because of its mild climate, giving it some cost advantages compared with other major EU producing countries. However, the average herd size is relatively low 46 in 2001, although it has increased from an average of 24 in 1991[7] .

There is widespread concern about the future viability of dairy farming as costs of production continue to increase, and prices are static or falling, and there are major restrictions to increasing scale and increasing production.

A recent analysis determined that the target level of profit for a family dairy farm needs to be around €55,000[8]. One option for meeting this target is production against a quota of 550,000 litres at 10 cents per litre profit. This will require a herd of approximately 90 milkers (double the current average herd size).

The conclusion is that Irish dairy farmers will need to increase efficiency, as well as the scale of the dairy operation. Opportunities for increasing scale are constrained due to land ownership and uneconomic land prices, although there is scope for the use of leased land, share farming, etc.

In Ireland there is also a recognition that the processing industry will need to develop value added products, though that will not yield results quickly and will be costly[9]. It will also need to rationalise, as the existing processors are significantly smaller than the main competitors.

Dairying In Tasmania

The Tasmanian dairy industry is based on grazing of rain-fed perennial pastures (plus some grain feeding and irrigation), and on the production of bulk commodities. Production costs are amongst the lowest in the world (comparable with New Zealand).

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[6] Fact Sheet on Irish Agriculture, October 2006. Economics and Planning Division, Department of Agriculture and Food.
7 Promar International. nd. Strategic Development Plan for the Irish Dairy Processing Sector.
8 Ramsbottom, G. 2006. Case studies presentation.
9 Tyrrell, J. n.d. ICOS Vision for the Irish Dairy Industry.

Dairy farm numbers have continued to fall, but production has increased from around 350 million litres to over 600 m litres. Real farm-gate prices have fluctuated around €2.30/kg Milk Solids over the last 15 years, and terms of trade are expected to decline into the future[10].

The longer term outlook is for modest growth in Tasmania due to high levels of producer confidence and interest from external investors in dairy conversions (converting extensive grazing and cropping properties to dairying). Consolidation of farms into larger units will continue; "the success of the industry is far more dependent on Tasmania's dairy herd size than it is on the number of farms"[11]. The key issue for the dairy industry is the continuing pressure on terms of trade. Dairy farmers will respond by increasing herd sizes from currently 275 cows to over 500 cows in the next decade. Herds in excess of 1,000 cows will become more common.

Around 60% of the milk is processed in one plant, but there is still excess processing capacity in the industry. There will be an on-going need to take up this capacity so that processing efficiency can be maximised.

Additional training facilities for all those in the industry will be necessary for productivity to continue to increase, and it will be important to find ways to retain skilled professionals.

The future of the dairy industry looks strong; it is the only agricultural industry currently attracting investment funds (outside Managed Investment Schemes that are driven by taxation advantages).

Beef Cattle

Irish Beef Industry

The beef cattle industry in Ireland is slightly larger than the dairy industry and is the largest single industry[12]. In 2002 1.5 million cattle were slaughtered. The government has been trying (unsuccessfully) to rationalise the processing industry as there is over-capacity with 42 EU approved plants in 2002. The McKinsey report envisaged a cut of 25% in overall capacity, but with falling numbers of cattle a larger cut may be needed to have a real impact on future costs and profitability[13]. However, farmers view the reduction in processing plants as a threat to competition in the market.

The Agrifood 2010 Committee[14] predicts greater competition in export markets, and this will require producers to lower their costs of production, provide better quality cattle for slaughter, and processors to be more efficient.

Tasmanian Beef Industry

Beef production in Tasmania is mostly conducted as a "sideline" to other enterprises. There is only one significant feedlot, and that produces premium quality beef specifically for Japanese markets. There are four main processing plants (with around 200,000 cattle slaughtered each year), and a number of live cattle are transported to the Mainland of Australia for fattening and processing.

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10 Doonan, B. 2006. Tasmanian Agriculture in 10 years Time Confronting the Challenges. Impact on Local Industry – Dairy. AIAST Symposium, July 2006

[11] Doonan, B. 2006. Tasmanian Agriculture in 10 years Time Confronting the Challenges. Impact on Local Industry – Dairy. AIAST Symposium, July 2006

[12] Fact Sheet on Irish Agriculture, October 2006. Economics and Planning Division, Department of Agriculture and Food

[13] Irish Examiner, Aug. 27, 2002. http://archives.tcm.ie/irishexaminer/2002/08/27.story5984893.asp

[14] Agri Food 2010 Committee Executive Summary.
www.agri-vision2015.ie/agrifood/execsumm.htm

There is potential for large increases in productivity (kilograms of beef produced per hectare) by improved pasture and grazing management. Grubb[15] predicts that there will be greater alignment between producers and processors through the take-up of forward contracts, and probably consolidation of processing facilities to one export abattoir and possibly one small domestic processor. Development of a branding strategy to promote Tasmanian product is expected to sustain demand within Australia.

Sheep Meat and Wool

Ireland

The sheep industry in Ireland is mainly for meat production. This industry is a minor contributor to Total Agricultural Output and is similar to pigs, cereals and root crops (including potatoes).

Tasmania.

The Tasmanian sheep industry has equal emphasis on meat and wool production. However, there is a gradual shift from dedicated wool flocks to cross-bred breeds that produce larger and better quality lamb carcasses.

Lamb prices have been buoyant since 2001 based on export demand, and have been in the range €1.80 to €2.40 per kilogram carcass weight.

There is scope for branding and improved marketing. Like the beef industry, the lamb industry is relatively fragmented with little forward contracting, and there is developing interest in lamb feed-lotting, although the local price of feed grains is higher than on the Australian mainland.

Tasmania produces around 4% of Australia's wool clip, and wool represents around 17% of the total value of Tasmanian Agricultural production. It is generally of better quality (less contamination and lower fibre diameter) than wool from the Australian Mainland.

The future for wool production in Tasmania appears to be in fine apparel wool for specialist consumer products and markets, with the wool marketed as a branded niche market fibre. Sheep producing this wool will generally be grazed on "low-input" pastures in the drier areas of the State. Productivity gains are possible through improved pasture and grazing management, and genetic improvements.

Other Enterprises

Pigs and poultry are relatively small industries in both Ireland and Tasmania, although the pig industry contributes 5.8% of the total value of agricultural production in Ireland.

Forages are extensively produced in Ireland for sale and use for animal production. Although historically famous for potato production, the industry currently accounts for only 3.3% of agricultural output.

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[15]. Grubb, B. Tasmanian Agriculture in 10 years Time Confronting the Challenges. Impact on Local Industry – Meat. AIAST Symposium, July 2006

Vegetable production for processing is relatively much more important in Tasmania, and accounts for around 18% of the Gross Value of Agricultural Output, with potatoes as the most important crop.

Prices paid by processors have not kept pace with inflation while costs of production have risen and the outlook is not encouraging. Imports of frozen vegetables from overseas countries (particularly China and New Zealand) are a major challenge. A recent assessment of Chinese agriculture[16] concluded that Australia's land-intensive farm commodities such as beef, sheep meats, wool, dairy and some crop sectors will experience growing demand from China. Conversely, China's labour-intensive agricultural commodities such as horticulture, intensive livestock and vegetable production appear likely to expand, and will provide increasing competition.

Vegetable production properties are generally diversified, with small scales of operation and this leads to high production costs. While there is theoretically opportunity for increased efficiency from increasing the scales of operation, the "high" price of rural land is a major impediment.

Tasmanian is the world's largest producer of licit poppies, producing 40%[17] of the world market for pharmaceutical alkaloids (particularly codeine and thebaine).

Plantings of stone fruits (particularly apricots and cherries) and vines for wine production are expanding in Tasmania. The areas are currently small, but prospects for growth are good.

The Irish Government has a program to assist the development of the horticulture sector by grants for capital expenditure in specialised plant and equipment in commercial horticulture. The scheme aims to promote diversification of on-farm activities, improve the quality of products, facilitate environmental friendly practices and improve working conditions.

Discussion

Farm Viability

A high proportion of farms in Tasmania are relatively small. In 2004-05 almost 65% of farms in Tasmania had a total value of agricultural output of less than €30,000, and in total these farms produce only 6% of Tasmania's value of agricultural output[18]. These smaller farms are generally reliant on off-farm income to support their operations[19].

The position in Ireland is similar. Of 141,000 Irish farmers, 42% are estimated to be part-time. By 2015 it is forecast that there will be 105,000 farmers, of which only 40,000 will be viable (not dependent on off-farm income). There were 28,000 dairy farmers in 2001; this is forecast to fall to 14,000 by 2010. However, only 3,000 farmers are now over the milk quota 70,000 gallon minimum threshold for future viability[20].

[16] "China – emerging opportunity or emerging threat"". Australian Farm Policy Journal, Vol. 4, No.1. February Quarter 2007.
[17] Rice, K. Tasmanian Agriculture in 10 years Time - Confronting the Challenges. Impact on Local Industry – Poppies. AIAST Symposium, July 2006
[18] ABARE Regional Outlook Conference, July 2006. Financial performance of Tasmanian farms.
[19] AgriVision 2015. Report of the AgriVision 2015 Committee.
[20] AgriVision 2015. Report of the AgriVision 2015 Committee.

Declining Terms Of Trade

The cost: price squeeze is apparent in Ireland in the dairy and beef industries, and in Tasmania in the meat, wool and processed vegetable industries. The conventional response is to increase productivity, and for producers to attempt to collectively bargain for higher prices. Productivity, particularly in the dairy industry, has increased; improvements in the meat, wool and processed vegetable industries have been less impressive in Tasmania.

An avenue that is commonly recognised is the need for producers to increase the scale of their production. This is occurring in the dairy industry in Tasmania, and is being pursued in Ireland. It has occurred to some extent in Tasmania in the processed vegetable industry with some shift from parts of the State where properties are relatively small and have highly productive soils, to other parts where the soils are not as good for intensive production (and yields per hectare are lower) but farms are much larger.

Aggregation of land titles to provide larger operating areas for the major agricultural industries would be highly desirable, but this is known to be difficult in both Ireland and Tasmania. Cultures are such that land ownership carries a number of social values in addition to the economic use of the land as a business resource. There is certainly pressure in the EU for farmers to increase scale, either by farmers sharing assets or by merging farms into larger units[21]. Many farmers in Ireland rent or lease farm land. There is potential for these arrangements to increase significantly in Tasmania.

Leasing, joint ventures and other types of business arrangements would help farm businesses increase in scale. Although these options are often recommended, uptake of these potential arrangements is disappointingly slow. Conservatism and the increasing average age of farmers has impeded change.

There is also potential for producers to work together, and with others in the supply chains, to improve efficiency and assist viability in all parts of the chain.

Competition For Land

Demand for land for "rural living" in Tasmania and Ireland has led in recent years to escalation in land prices to levels that make purchase of land uneconomic for agricultural use. This demand is most evident in proximity to metropolitan and rural centres, transport lanes and the coast. The result is that farmers under financial pressures wish to subdivide their holdings and sell smaller parcels of land to maximise sale returns. Where this occurs land values escalate beyond prices that are economic for farming uses. In Tasmania a State Government policy prohibits the conversion of the best quality land from agricultural uses.

Part-Time Farmers

Owners of smaller holdings are more likely to be "part-time" farmers, earning a significant proportion of their income off-farm; multiple sources of income are increasingly apparent in the farming sector. These "part-timers" are unable to be efficient low-cost producers, so production of commodities is unattractive for financial and personal reasons, and there is commonly a desire to produce niche or valued added produce, yet these farm owners often lack technical and marketing skills for such production. At least in Tasmania, expansion of niche market production is constrained by a lack of marketing entrepreneurs.

[21] Marsh, J. 2005. The Implications of Common Agricultural Policy Reform for Farmers in Europe. Farm Policy Journal, Vol 2. No. 2.

It is recognised in Ireland that farming activity will increasingly be undertaken as a part-time activity[22], and extension activities deliberately target these farmers.

Marketing

In both Tasmania and Ireland the need to differentiate commodity products is recognised. The Tasmanian government has attempted to develop a Tasmanian brand that can be applied to any Tasmanian produced product.

Similar plans have been recommended in Ireland; the Agri Vision committee recommends "mechanisms be put in place to encourage local and regional branding opportunities"[23].

There is a recognition in Ireland of the close links between agriculture and tourism. Encouraging speciality local producers is expected to add value to the Irish tourist industry, and this is being aided by special labelling that indicates the origin of the food products. This direction is also being followed in Tasmania.

Community Demands

Markets for Irish and Tasmanian produce are increasingly demanding evidence of "best practice" environmental management and "ethical" production systems. This has resulted in the development of Environmental Management Systems (EMS), and the offer of financial incentives in Ireland for land management that meets specified environmental outcomes. Some incentives are also available in Tasmania, for example for covenanting areas of native vegetation that will be preserved in perpetuity.

The uptake of EMS has been limited. Farmers are generally averse to meeting the documentation requirements, and the market access and financial benefits of their implementation have been unconvincing. However, there are emerging markets for "environmental services"; we should be able to create farm income by providing these services. In Tasmania there is interest in planting trees for carbon sequestration; other opportunities need to be developed.

Farmers generally find the increasing community expectations frustrating, financially unrewarding, and an infringement on their rights. However, avoiding the expectations does not appear feasible.

Availability of Skilled and Casual Labour

Wages paid to workers in agriculture are generally lower than in other industries, and the relatively low returns to capital discourage the children of farm owners from taking over the family farm. In addition, well motivated young people are less attracted to farming as a profession because the capital required to purchase a farm of their own is generally not achievable. The general result is a shortage of well trained and skilled farm managers. There is also a shortage of casuals particularly for harvesting operations in the horticulture industry in Tasmania, and this could constrain growth of these industries.

Other Opportunities

Learning in all forms is a key ingredient to facilitating change. Yet our aging and conservative farmers have generally not embraced on-going training. We need to encourage a positive attitude to on-going education, particularly in strategic planning to enhance creativity.

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[22] AgriVision 2015. Report of the AgriVision 2015 Committee.
[23] AgriVision 2015. Report of the AgriVision 2015 Committee

If talented young people are to be attracted to agriculture, we need to pay more attention to image development, family teamwork and business succession, and we need to offer whole-of-supply-chain employment opportunities to young people, not just present agriculture as a production business.

Island communities tend to be conservative and lack creativity. We need to work with others (such as Nova Scotia, Canada) to collectively address common issues and develop solutions.

Conclusions

The difficulties and potential solutions for agriculture are similar in both Ireland and Tasmania, and both are moving in similar directions to sustain the viability of farming and rural communities.

It seems likely there will be a declining trend in the numbers of farmers and farm holdings in both Tasmania and Ireland, and in Ireland at least declining production[24]. Clerica (2005) concludes that in the EU agricultural sector "only efficient farms and niche product farmers will survive"[25]. This conclusion appears equally applicable to Tasmania.

Efficiency can be increased through improving the scale of farming enterprises, and in the processing sectors. This is constrained by conservative approaches to land ownership and business management; moves to establish more innovative business structures such as joint ventures, leasing, share-farming and cooperatives should be supported and used as extension models.

Growth in the farming sectors will be aided by increasing the value of products through the development and marketing of "niche" products, rather than increased production. Diversification and intensification of production will increase, and this needs to be encouraged. This will require greater emphasis on marketing, and efforts are being made in Tasmania and Ireland to develop branded products. There is also potential to integrate the marketing of niche agricultural products with tourism.

Farmers are becoming less dependent on farm income; the number of part-time farmers is increasing and the reliance on off-farm income is increasing. This trend is in part driven by the demand for "rural living", and in part by the cost: price squeeze. Nevertheless, public policies should recognise the change, and ensure that these part-time farmers are helped to maximise the productivity of their land resource.

The farming sectors have not been competitive in retaining labour resources; cost pressures have restricted opportunities for the sector to offer attractive wages and conditions. Farm managers are improving the efficiency of production, and increasing output per labour unit. However, it is being recognised that due to relatively high labour costs in Ireland and Tasmania, those industries that continue to require high labour inputs are likely to become even less competitive on world markets. There will be opportunities in the horticulture sectors to better manage and integrate casual labour, for example to attract "back-packers" to fruit picking. The key will be to better organise travel and accommodation to meet the requirements of transient workers.

Increasing community demands for the landscape and rural communities to be managed for social and environmental outcomes are placing additional stresses on farmers, and a number of Environmental Management Systems are being developed and promoted. However, at this stage acceptance by many

[24] Clerica, F. 2005. 'Balancing" Interest and Reforming the Common Agricultural Policy. Farm Policy Journal. Vol 2. No. 2 Pages 33-39.
[25] Clerica, F. 2005. 'Balancing" Interest and Reforming the Common Agricultural Policy. Farm Policy Journal. Vol 2. No. 2 Pages 33-39.

farmers is unattractive because the cost and diversity of schemes and because the benefits are not demonstrated. Simplification and integration of schemes will facilitate their adoption.

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THE ROLE OF AGRICULTURE IN THE RURAL ECONOMY
CHALLENGES FACING AGRICULTURE TODAY

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Abstract

The issues of farmland acquisition, tenure and succession are of great importance for agricultural families, their successors and the rural communities in which they live. As the age of farm/ranch operators increases, we see agricultural assets held in fewer and older hands. In the next 20 years, a majority of farm businesses will change hands. The transfer of a farm business requires assets, income and management be transferred to the successor generation. Methods of transferring assets and income are well documented. The process for transferring management is however more problematic. Recent research has shown this is to be an international issue. The authors will survey available educational material and teaching methods to select the best curriculum and practices to facilitate the transfer of management from the owner generation to the successor generation. Further, the authors will illustrate the teaching of the materials through a demonstration of the best practices.

Keywords: Succession, transfer, management, curriculum, practices, ageing

Introduction

The transfer of a farm family business from the owner generation to the successor generation requires the assets, income and management be systematically transferred to the successor. Methods and process of transferring assets and income are well documented. The methods and processes of transfer from the owner generation to the successor generation is less well understood and documented. Current research conducted under the Farmtransfers international research project has shown that this is international issue. (Baker 2007)

Table 1: Rank order of managerial authority retained by the owner/operator generation

Decision	Iowa 2006	Aus-tralia 2004	Vir-ginia 2001	Japan 2001	Ontario 1997	Quebec 1997	England 1997
Decides when to pay bills	1	1	1	2	1	1	1
Identify sources & negotiate loans & finances	2	2	2	1	2	2	2
Negotiate sales of crops/ livestock	3	7=	4	6=	3	3	3
Decide when to sell corps/ livestock	4	6	5=	6=	4	5	4
Level of inputs used	5	8	3	5	11	6	13
Decide & plan capital projects	6	4	7	9	5	8	5
Negotiate purchase of machines & equipment	7	5	8	12	6	9	8
Plan day-to-day work	8	9	12	3	12	11	9
Decide work method/way jobs are done	9	12	13	10	13	13	12
Decide long term balance & type of enterprises	10=	3	5=	11	7	10	6
Decide timing of operations activities	10=	10	10=	8	9	7	10
Decide type & make of machines and equipment	10=	11	10=	13	10	12	11
Make annual crop/livestock plans	11	7=	9	4	8	4	7

The identification of a successor, retirement and the transfer of managerial authority are related. Recent research conducted in Iowa demonstrated that a majority of farmers will either semi-retire or never retire. (Duffy 2006) The survey defined retirement, semi-retirement and never retiring as follows:

1. I expect that I will never retire from farm work. (You will maintain full managerial control and provide some labor to the farm.)
2. I expect to become semi-retired at some stage. (You will provide some managerial control and/or labor to the farm.)
3. I expect that I will retire from farm work at some stage. (You will provide neither managerial control nor labor to the farm.)

Thirty-one percent of those responding indicated they would never retire; forty-six percent indicated they would semi-retire: twenty-three percent indicated they would fully retire. (Duffy 2006) Of those indicating they would either fully retire or semi-retire they indicated that twenty-seven percent of their retirement income would come from the farm business. (Duffy 2006) The implication is that the successor must carefully consider whether or not the transfer of this amount of farm income to the owning generation, to partially fund, their retirement will cause any succession plan to be difficult if not impossible.

Duffy (2006) divided the responses of those surveyed in the most recent Iowa replication of the Farmtransfers survey into three categories: the first being production decisions, the second being management decisions and the third being financial decisions.

Production decision include the following: Plan day-to-day work, Level of inputs used, Decide timing of operations/activities, Decide work method/way jobs are done. Management decisions include the following: Make annual crop/livestock plans, Decide long-term balance and type of enterprises, Decide type and make of machines and equipment, and Decide when sell crops/livestock. Lastly, financial decisions include the following: Negotiate sale of crops/livestock, Decide when to pay bills, Negotiate

purchase of machines and equipment, Decide and plan capital projects, and Identify sources and negotiate loans and finances.

Clearly the authorities to make those decisions concerning the financial management of the farm are the last to be transferred to the successor. Conversely, the authority to make those decisions concerning production is the first to be transferred to the successor. The remaining management decisions are shared between the owner generation and the successor generation. (See Table 2 infra.)

Table 2: Rank Order Of Managerial Authority Retained By Iowa Owner/Operators

Decides when to pay bills	1
Identify sources & negotiate loans and finances	2
Negotiate sales of crops/ livestock	3
Decide when to sell corps/ livestock	4
Level of inputs used	5
Decide & plan capital projects	6
Negotiate purchase of machines & equipment	7
Plan day-to-day work	8
Decide work method/way jobs are done	9
Decide long term balance & type of enterprises	10=
Decide timing of operations activities	10=
Decide type & make of machines and equipment	10=
Make annual crop/livestock plans	11

The speed with which the transfer of decision making authority is transferred from the owner generation to the successor generation varies among the countries surveyed with England and Iowa having he slowest rate of transfer (Errington and Lobley 2002). The pattern of the owner generation maintaining control of the financial decisions is consistent throughout the populations of those countries that have replicated the Farmtransfers survey. (Uchiyama 2004)

While the transfer of the decision making authority with respect to production decisions and management decisions is a necessary component of any farm business management succession plan, such transfer does not equate to the transfer of the control of the farm business. It is axiomatic that the generation that has the authority to make the financial decisions in the farm family business controls the farm family business. Therefore the owner generation must transfer the financial decision making authority to the successor generation in order to complete the farm business transfer to the successor generation.

The critical and often overlooked factor in the development of a farm business succession plan is the identification of the priorities/values of the parties involved (Baker 1997). The owner generation must provide the leadership in the development, as the owner generation possesses all decision making authority prior to the entry of the successor generation. Therefore, it is the owner generation and only the owner generation that can initiate the transfer of decision making authority. The decision as to whether or not to transfer such decision making authority to the successor generation is based upon the priorities/values of the owner generation.

For example, as noted above, in Iowa the owner generation expects to receive twenty-seven percent of their retirement income from the farm business. It is logical to assume that one reason to maintain control of financial decisions is that the priority/value placed upon a secure financial retirement is greater that the priority/value placed upon the transitioning the farm business to a successor. A further reason is that the owner generation is increasingly risk averse and may over estimate the risk associated with the transfer of financial decision making to the successor generation.

The identification of the values/priorities of the owner and successor generations is critical in the transfer of transferring managerial authority and responsibility. Whilst the discussion of the identification of values/priorities is beyond the scope of this paper the importance of there determination can be seen when the following is considered and understood.

- Values/Priorities = That which is important to and individual and lead to:
- Vision = That ideal condition envisioned at some future point in time and leads to:
- Mission = The behavior that is consistent with the values/priorities and vision and leads to:
- Goals = The specific accomplishments that are consistent with the values/priorities, vision and mission and require:
- Objectives = The criteria by which progress toward completion of goals will be measured and require:
- Strategies = The planed activities consistent with the objectives used to measure progress toward completion of the goals and require:
- Tactics = The tasks necessary to implement the selected strategy.

Two factors must be considered in developing that portion of a farm business succession plan that will result in the transfer of decision making authority from the owner generation to the successor generation. The first factor is the determination of what decision making authority will be transferred and the second is the timing and the sequence of such transfer. These two factors are closely linked and for pedagogical purposes only should be taught as separate subjects. It is advisable to present these subjects seriatim.

It is essential that the transfer of decision making authority be placed in an overarching context that describes and clearly sets out expectations of the owner generation and the successor generation. All too often the expectations of the parties are not described with the necessary specificity and particularity necessary to create a common vision, a common mission and mutually agreeable goals for the transition of the decision making authority from the owner generation to the successor generation.

An effective method of identifying what decision making authority is to be transferred is to have both the owner generation and the successor generation write a position description for the position. Given that each farm family business is unique and that the owners and successors are at different points in the transition process the writing of a position description allows the parties to describe their unique situation. After the owner generation and the successor generation have written such descriptions they will use both descriptions to create a mutually agreed upon description for the position the successor is to fill in the farm business. The completion of this exercise will clarify the expectations of both generations concerning the work to be performed, the level of responsibility of the position, the authority to make decisions, the rate of compensation and the factors that will be considered for compensation increases. It will also lessen the potential for conflict that is a result of unclear or unstated expectations.

Position descriptions should be written in plan language and should provide answers to the following questions:

- What is the work that is to be done?
- Why is the work to be done?
- When is the work to be done?
- Where is the work to be done?
- Who is to do the work?
- How is the work to be done?
- Who is to provide the necessary help to do the work?

The position that is to be filled by the successor should have a title that describes the nature of the work that is to be performed and the responsibilities required by the position. The purpose of providing a title is to identify the relationship between the owner generation and the successor generation. If the successor

is the child of the owner it is important for the owner to realize that the relationship is a business relationship and not a parent-child relationship and treat the successor as a business partner and not as a child, and the child needs to treat the owner as a business partner and not as a parent.

The position description should contain a summary of the duties that are to be preformed. This summary should be a short and plain statement of the purpose of the position and should include a listing of who is to be communicated with on a regular basis.

A detailed listing of the duties and responsibilities of the positions and examples of the functions to be performed must be included. The amount of time designated for each function should be specified and the relative importance of each function should be listed. A designation of essential and non-essential function should be set forth.

The required knowledge, experience, training, skill and ability necessary to perform the work described should be stated and any unique or special abilities or skills should be prominently noted.

The range of compensation should be specified and should include method of compensation. Further, it should be specifically set forth when the position will be evaluated for increases and what factors will be considered in evaluating performance that will determine the amount of the increase in compensation, if any increase is warranted.

Once the position description is agreed upon the parties must mutually agree upon the rate of the transfer of decision making authority. A useful method for determining a time line is the critical path method of management. The critical path method allows the parties to identify the resources necessary to transfer the decision making authority, for example the successor completes certain training or works with the owner for a specified period time to learn the decision making skills employed by the owner. It is an effective method of analyzing the complexities involved in transferring decision making authority to the successor generation. The critical path method focuses the parties on the essential activities and is an effective method of monitoring the transfer of the decision making authority. It also requires the parties to establish priorities and the time needed to complete the transfer of the decision making authority. Lastly it provides a graphic overview of the transfer process.

The parties identify sequential activities and the parallel activities. The context in which the activity takes place determines if it is a parallel or sequential activity. Sequential activities are activities that are dependent on other activities being first completed. Sequential activities must be completed in an ordered sequence. Each activity in the sequence must be completed, or near completion, prior to the start of the next activity in the sequence. Parallel activities are activities that are not dependent on the completion of a previous activity or activities. In should be noted that parallel activities may be and usually are of equal importance to sequential activities.

An essential element of the critical path method is the estimation of the time needed to complete an activity. It often difficult to estimate the amount of time needed to complete an activity and this is particularly true if it is a new activity.

It is normal to underestimate the time need to complete an activity. Also holidays, sickness, emergencies, unavoidable delays and events beyond the control of the parties must be considered. A systematic approach should be used to estimate the amount of time necessary for each activity and the patties should rely upon their experience.

The first step in the critical path method is to list all the activities that need to be completed to transfer the decision making authority to the successor generation. Many of the activities will be those set forth in the position description completed by the parties. The next step is to determine the priority of each activity

and to identify the earliest practical start date for that activity, the amount of time necessary to complete the activity and to determine if the activity is a sequential activity or a parallel activity. The parties should mutually agree upon how to measure the activity and who is responsible for the activity and how and to whom the activity will be reported.

The following worksheet is helpful in the listing and prioritizing all of the activities.

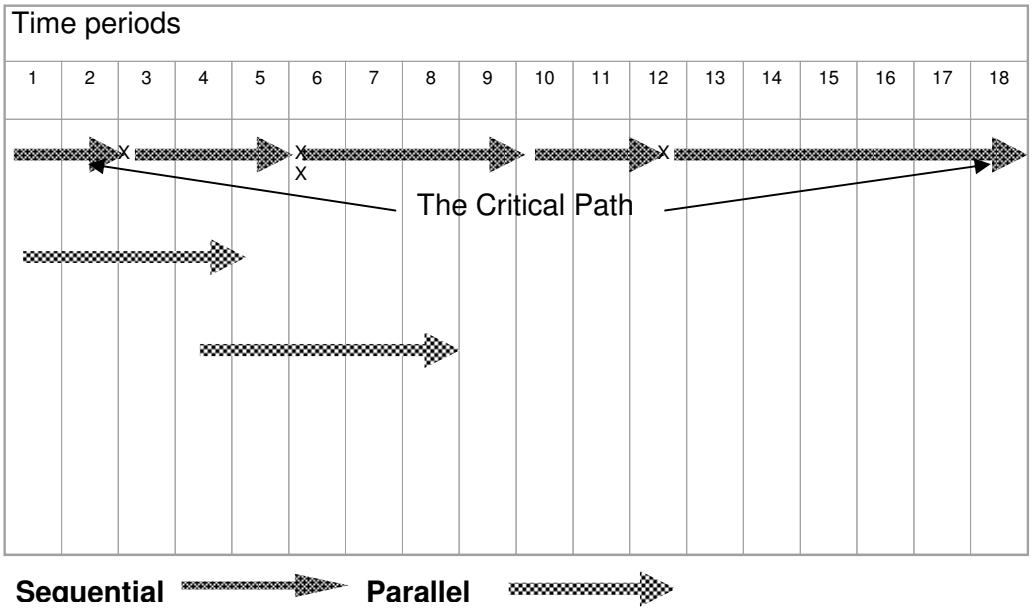
Critical Path Worksheet

Activity _____
Sequential and dependent upon _____or Parallel
Starting date _____
Amount of time until completion _____
How will the activity be measured _____
Who is responsible for the activity _____
How and to whom with progress be reported? _____

The next step in the critical path method is to produce a caption graph paper with the total of time needed to complete the plan which may be determined by summing the number of days to completion from the worksheets. Begin with the activities that have the earliest start dates and draw a line through the appropriate number of time periods. Show the activities as arrows the end with a X. Show the amount of time needed to complete the activity above each arrow and indicate if the activity is a sequential activity or a parallel activity. Make sure that the sequential activities are listed in the proper sequence and show the time taken to complete the activity above each arrow. Schedule parallel activities so as not to interfere with the sequential activities. It is obvious that any delay in the commencement or completion of an activity on the critical path will delay the completion of the whole plan or the time allowed for future sequential activities will need to be shortened.

The final step is to prepare a clean final copy of the critical path chart. The positions and length of the arrows show the start date and time needed to complete of the activity. The Critical Path is the longest sequence of sequential activities necessary for the completion of the transfer of the decision making authority from the owner generation to the successor generation. Set forth below is an example of a critical path chart.

Figure 1: Critical Path Method Chart



The combination of writing a position description containing a list and description of the functions to be performed and the decision making authority required by the position along with the determination of the priority of each activity and the length of time required for its completion is an effective method of educating the parties concerning the need for, and the way to, transfer decision making authority.

BE GOOD AND TELL IT? RE-ESTABLISHMENT OF THE CONNECTION BETWEEN LIVESTOCK INDUSTRY AND SOCIETY.

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Abstract

The pork, poultry and dairy production chains have been of major significance for the rural areas of Western Europe. They provided food in abundance, employment and economic activities. In the last decade, however, there is an increasing awareness in society to farming. A gap has grown between animal production methods and the perceptions of society. The project BGood is looking for new ways to re-establish the connection between the livestock industry and society. These ways concentrate on communication strategies. Repairing a damaged relationship is, however, more than improving image. It is a combined action between image (to see) and identity (to be) (Birkigt & Stadler, 1986). Therefore, the communication strategies focus on changing society's view of animal production (image) and changing the attitude of the livestock industry towards society (identity). Twenty-five interviews have been conducted to explore how people working in other, non-agricultural, industries have acted in situations to bridge a gap (e.g. church and society, politics and civilians, chemical industry and their neighbours). Surprising ideas and comments have come up: "People want to identify themselves with a person (the farmer). They can't identify themselves with the high technology systems you're always presenting.", or "Start to think of yourself as a food producer, not as an animal care taker.", or "No visibleness means no engagement." The project is now at a stage where the plurality of ideas will be used as inspirational examples in a series of meetings with people from the agricultural industries. They will form working groups that take over the ideas and put them into practice. At the IFMA-congress the process during and results of the meetings will be presented. One of the conclusions of the project so far is that the cooperation between agriculture and non-agriculture was clarifying, gave us eye-openers and was very fruitful.

Keywords: animal production, society, communication strategies

Purpose

The pork, poultry and dairy production chains have been of major significance for the rural areas in Western Europe. They provided food in abundance, employment and economic activities. During the last decade, however, there is an increasing responsiveness of society to farming. Rural areas get more densely populated and, lately, more and more by urban people. This phenomenon leads in practice to a conflict, which can be scaled down to the economic principle of property rights of resources. Rural amenities such as air, space and landscape are for everybody and with increasing population and intensive agricultural production in rural areas the competition for these resources is high and leads to more interference from society in agricultural production (Goldsmith, 2004). Next to this there is a growing awareness in society of how animals should be taken care of and, sometimes almost humanely, should be handled. These developments disclosed the fact that a gap has grown between animal production and perceptions of society.
The aim of the project BGood is to look for new ways to re-establish the connection between the livestock industry and society. These concentrate on communication strategies, while bridging the gap

starts with contact. Repairing a damaged relationship is, however, more than improving image. It is a combined action between image (to see) and identity (to be) (Birkigt and Stadler, 1986). Therefore, the communication strategies focus on changing the views of society of animal production (image) and changing the attitude of the livestock industry towards society (identity).

Methods and Principal Results

'Outside-Inside' Approach

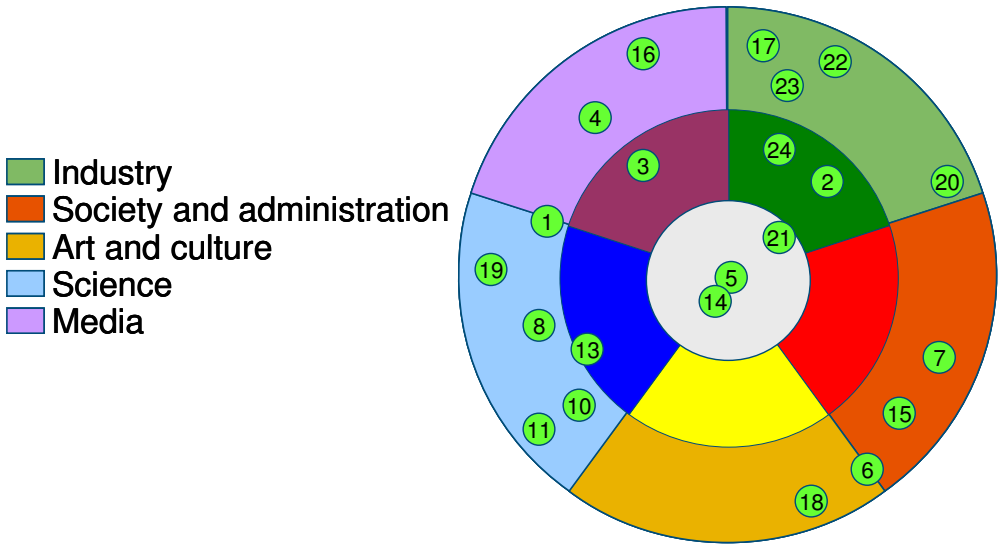
The project BGood is based on an approach which is called by the project as the '*outside-inside*' approach. In short this approach comprises of that inspiration gained from people, activities and examples *outside* the agricultural sector in relation to the theme of bridging gaps, in order to develop innovative initiatives *inside* the agricultural sectors which give an interpretation of the goals of the project.
This *'outside-inside'* approach was chosen for a specific reason. Over the last decade many initiatives have 'seen the light' and were implemented in the livestock production chains to fulfil to a greater extent the needs of society. Nevertheless it was concluded at the end of the Dutch national debate on pig and poultry production (19th January 2005), that these initiatives haven't noticeably narrowed the gap between animal production and perceptions of society. Real breakthroughs and transitions in communication strategies do apparently not find their origin within agriculture itself. Therefore, it was necessary and thus decided to gain new insights on communication strategies outside the agricultural sectors.

From Outside…

Interviews were conducted in the period June 2006 to November 2006 to explore how people working in other, non-agricultural, fields have acted in situations to bridge a gap (e.g. church and society, politics and civilians, chemical industry and their neighbours). A format was set-up to talk to a large diversity of people across five different fields (non-agricultural industry, society and civil administration, art and culture, science, and media) and three different levels of the person's involvement in the agribusiness (not, moderate, complete); see Figure 1.

In total 24 persons were interviewed. The distribution of interviewees was odd (Figure 1). We succeeded in contacting inspiring people within the art and culture field and the society and administration field, but didn't manage to interest them in an interview to share their experiences with others.

Figure 1: Overview of the 24 interviewees according to their working field and their involvement in agri-business (outer circle = no involvement, middle circle = moderate involved, inner circle = totally involved).



At least 60 fascinating and valuable leads came up in the interviews. The materials - or building stones - originating from the interviews were, however, not useful in that format. Therefore, they have been grouped into clusters of building stones. Together, these building stones provide an important eye-opener for those in agricultural production chains, in relation to the way they typically communicate. The three most important eye-openers will be presented in the following bullet points:

- The first eye-opener points at identification. The focus of a communication strategy should be on a person (the farmer) and not on a system (the farm). People want to, and can only, identify themselves with a person and not with the high technology solutions presented by agricultural production chains. The latter creates distance and results in persistence of the gap between animal producers and society, no matter how society-oriented the production is. This argument is naturally followed by the building stone to communicate experience instead of facts, such as, the environment is protected by a certified 90% ammonia reducing air treatment system. Only one or two decades ago people wanted to be and were taught on the basis of such factual material and knowledge in, for example, fact sheets and documentary films. Nowadays the majority of society is more interested in feel-good and 'reality actions' and want to be entertained. This doesn't implicitly mean that in between they can't be taught, but increasing knowledge is not the main attraction to such programs or activities for them. Agriculture could make more use of entertainment as an instrument in its communication with society (with an emphasis on 'with' instead of 'to' society). To summarise, central principles in this eye-opener are: communicate with society making people central in entertainment-like activities, so civilians can identify themselves with the farmer and learn something about agricultural production along the way.
- The second eye-opener points at food. Following the first eye-opener, it is important in communication strategies to focus on elements where agricultural production can connect to society. Food is an every day connection between, and a meeting place for, these two sides of the chasm. Its value in communication is underestimated by producers. Relevant to this building stone is that farmers should start to think of themselves as food producers, not as animal carers takers. An obstacle to this eye-opener arises because the food production chain is made up of many links and is complicated and distant to consumers. Consumers should be more part of the food production chain and reclaim a part of food production. In this way they can identify more with the fact that food is produced and that farmers are part of this production process, instead of the idea that food is something synthetic coming from factories. Subsequently, the challenge is to break the taboo that meat originates from live animals and make it subject of discussion. This can be more easily done

with children than adults, while the former group is in general more un-biased, open-minded and susceptible for this discussion. To summarise, central principles in this eye-opener are: conduct a dialogue on food, in which consumers experience (partly) how food is produced and start to communicate with children to break taboos on the origin of food.

- The third eye-opener points at values. Farming is for many farmers a way of living. Many people not working in agriculture and to a large extent that have not grown up on a farm would, for this reason, might like to be a farmer for one day. Farmers could help them to discover the cultural value of 'a bit farmer today' and let them get a taste of farming culture, which might increase mutual understanding. This cultural value is one of the fundamentals of animal production. Additional current values and foundations need to be assigned to determine the justification of pig, poultry and dairy production sectors nowadays. The old adage 'no more hunger' is not a valid foundation anymore for these sectors in developed continents such as Europe. To summarise, central principles in this eye-opener are: rediscover the foundations of animal production and communicate these values with society, so they relate to farming.

... To Inside

The eye-openers based on the plurality of building stones originating from the interviews with people working in other, non-agricultural, fields (non-ag people) was passed on to producers and other representatives of the animal production chains (ag people) in a series of two meetings up to now. In these meetings both ag and non-ag people took part, so non-ag people could share their insights directly with ag people (hear and learn from first hand), new contacts would be made and innovative collaborations could come about.

The first small-scale closed meeting in February 2007 was used to get acquainted and to set the agenda for the second large-scale meeting. In the first meeting about 20 people were invited and took part. They were the carriers of the second meeting in April 2007, to which over 100 people were personally invited. Aims of the second meeting were to generate new contacts and function as a breeding place for innovative communication strategies for the livestock production sectors. This meeting consisted of three blocks:

- Opening session with film fragments and spoken columns to open the minds of those present.
- A forum where building stones originating from the interviews could be discussed and, if appealing enough for participants, can be used.
- Discussion tables to debate further and in line with the points arising form the identified building stones. Every table had a theme in which one of the eye-openers was placed central.

The project is now at a stage to evaluate what can be harvested from the second meeting and to decide whether subsequent meetings are necessary and in which form. At the IFMA-congress the results of the second meeting will be presented.

Discussion and Conclusions

One of the conclusions of the project so far is that the cooperation between agriculture and non-agriculture was clarifying, gave eye-openers and was very fruitful for idea generation. It has to be seen whether they will be brought into agricultural practice and will be effective in bridging the gap between the livestock industry and society.

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NEW ZEALAND GOVERNMENT'S INVOLVEMENT IN AGRICULTURE – **THE ROAD TO NON-SUSTAINABILITY**

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Abstract

Why did a small urban based population think it could subsidise it's dominantly export agriculture? What pre 1984 policies, created a non sustainable, subsidised New Zealand agriculture where increased output was worth less than the cost? The election of a Labour Government by an urban based population, World War II, introduction of modern agricultural technology and a commodity boom lead to policies aimed at increasing agricultural exports to fund the imports required by an expanding, protected manufacturing sector. These resulted in a burgeoning bureaucracy and an increasingly uncompetitive economy. Specific problems were fixed on an ad hoc basis but the watershed was the UK joining the EEC and NZ's loss of a guaranteed market. The policy response was to encourage farm production with a complex suite of measures, without regard to international competitiveness. This paper outlines the economic and agricultural policy context that lead to the radical surgery of 1984.

Keywords: New Zealand, non-sustainable, bureacracy

In 1882 the first shipment of New Zealand refrigerated cargo left the Port of Otago, on the S.S.Dunedin for Great Britain. That event ushered in nearly a century of unrestricted agricultural trade, dominated by meat and milk products**.** Primary products were, and still are, the dominant components of New Zealand's export trade which provides the rationale for successive governments' involvement in agriculture in a variety of policy formats. The aim of this paper is to provide a summary of significant policies and dates relating to both production and marketing up to 1972, when Britain joined the EEC and then a more detailed discussion of the post 1972 period.

The breakup of "Ready Money" Robinson's Cheviot Hills Estate in 1893 established a pattern of Government purchase of land for further subdivision into commercial farms for on sale to individual settlers and with the ability to provide appropriate finance (Advances to Settlers Act 1894). This policy was greatly expanded to include the development of land before settlement in 1929 in order to meet the promises made to servicemen returning from overseas service. The Department of Lands & Survey operated a massive development programme, especially through the 1950-70 period, that was so successful that it was extended to selected young civilian farmers who had demonstrated their managerial ability, but lacked sufficient capital The settlement of ex -servicemen was an instrument of deliberate social policy and the economics of the scheme were subordinate to the social aims. By 1960 over 3,500 ex-servicemen had been satisfactorily settled and by 1964 a further 80 with the addition of 494 civilians. The State Advances Corporation, which later became the Rural Bank (1974), was charged with the responsibility of providing appropriate finance and oNGOing budgetary supervision. The fundamental objective of these policies was to get young men established on economic, one man farms that had the potential for further development and growth. In 1964 the Government decided that a break even policy of development costs would be introduced which reduced the rate of settlement. The Rural Bank continued to develop various forms of assistance for those seeking farm ownership that by 1977 consisted of: Farm Ownership Savings Accounts, Loans to Sharemilkers and Lessees, Farm Worker Settlement

Loans, Agricultural Contractors Base Establishment loans, Standard Settlement Loans and Special Settlement Loans.

The period between the wars was one of boom and bust, culminating in the Depression of the 1930's. Following W.W. I and the withdrawal of a number of private firms from the agricultural processing and exporting market place the government was involved with the establishment of a number Producer Boards – Dairy, Meat, Wool etc which had varying responsibilities and powers of processing, marketing and exporting. Ensuring that agricultural products were appropriately processed and marketed was one thing but there was also a farm debt crisis to be resolved as well. In 1936 the first Labour Government enacted the Mortgagors and Lessees Rehabilitation Act which allowed farmers in financial distress to apply to the Land Court to have their debt restructured or written off. While it had some brutal side effects – a reluctance of private lenders to offer farm mortgages, this Act did help stabilize the land market. To help fill this mortgage gap a state bank – the State Advances Corporation (SAC) was formed. The SAC subsequently became the Rural Bank & Finance Corporation (RBFC) in 1974 and became a major player in the debt crisis of 1985.

The outbreak of World War II lead to the NZ and Australian governments purchasing all meat, wool and dairy production from farmers at fixed prices and on selling those products to the British Government. At the end of the war the Joint Organization, as it was known was wound-up, and the accumulated surpluses distributed to the respective governments. In New Zealand those profits were paid out the respective Producer Boards to be retained as capital reserves to underpin their activities, while in Australia the funds were disbursed to the individual farmers. The existence of these capital reserves had an important bearing on subsequent agricultural policy in New Zealand for the next three decades.

No sooner had the Joint organization been wound-up than the Korean War triggered a boom in wool prices which created a massive windfall gain for both New Zealand's export income and individual New Zealand sheep farmers. The Government was very concerned about the potential for explosive inflation in an economy just coming out of post World War II rationing and resource restrictions. It therefore decided to freeze one third of each farmer's wool income in a special individual IRD account. Furthermore the money was not to be taxed until withdrawn. Farmers saw the opportunity to use the frozen funds as a means of investing in tax deductible, on farm development over a period of years, and thus took advantage of all the types of new technologies becoming available in the market. Accelerated land development, increased stocking rates and a burgeoning product flow being sold into an undersupplied international market led to New Zealand achieving one of the highest per capita incomes in the world. At the same time the Government embarked on a strategy of developing protected secondary manufacturing in order to boost employment rates in a growing economy. The government introduced quantitative controls - import quotas, for manufactured goods, and this eventually lead to the introduction of price regulations- tariffs, as well. Increased agricultural exports were required to bankroll the resource imports needed by the expanding manufacturing sector, even in the face of falling international prices.

The 1963 Agricultural Development Conference was a Government sponsored attempt to the policies and resources required to boost New Zealand's livestock stocking rate to 100million Stock Units with the attendant flow-on of primary product for export. It was assumed that the entire increased product could be satisfactorily marketed internationally. The influence of a liberal Commissioner of Inland Revenue was significant in the establishment of a generous taxation regime for farmers intent on development. Unfortunately some rude shocks were looming on the horizon. In 1966/67 the wool market suffered a significant price fall and eventually tumbled to levels comparable to those of the Depression, bar a brief respite in the early 1970's.The Wool Commission, backed by the accumulated Wool Board reserves bought the majority of the clip which not only took product out of the wool pipeline but confronted the economy with a shortage of foreign exchange and the Government with a significant internal deficit. The

position was unsustainable, especially when on 13 October 1967 the Commission bought 46.5% of the Dunedin catalogue, an action that precipitated a modification of Wool Commission operating strategy from wool purchase to price supplementation. In November 1967 the country devalued and a decade of inflation began. The lesson of the power of the market was not well learnt and the policy of economic insulation continued and indeed deepened.

1972 was a watershed, following Britain's decision to join the EEC and the loss of Commonwealth Preference. The New Zealand government was forced to renegotiate the access of all its primary products to that trading block. In addition it focused attention on the need to diversify New Zealand's primary production systems and international markets even though the country had reached a record level of overseas reserves. The first oil shock of 1973 confronted the newly elected Kirk Labour Government with a difficult decision and their solution was to borrow overseas in order to maintain the level of economic activity. This lead in an era of increased manufacturing and local industry protection to a rapid increase in the rate of inflation and an economy that was not well managed. The problems created by fluctuating commodity prices generated considerable concern and the establishment of the Farm Income Advisory Committee. This committee was required to produce a Farm Income Policy consistent with a required rate of growth remaining market responsive, whose fluctuation effects could be cushioned from both the farmer and community standpoint. The Zanetti Report as it came to be called made a number of recommendations most of which were seen as unacceptable either by Government or farmers. Some of their recommendations did see the light of day in modified form at a later date.

In 1960 subsidies to agriculture hardly existed and they were then opposed by most farmers and their leaders. From then until 1984 there was a gradual and continuing acceleration of production grants and subsidies. By 1980 they were being demanded by the majority of farming leaders who believed they were necessary for their industry's survival in an economy operating under a relatively free wage bargaining system, a virtually fixed exchange rate and uncontrolled interest rates, plus of course import controls and restrictive practices of many kinds. A perusal of the annual New Zealand Budget and Estimates of Expenditure reveals the growing significance of assistance to agriculture (see Appendix I).

The election of the Muldoon National Government in 1975 led to a decade of increased Government involvement in agriculture. A policy of encouraging farmers to increase production was again implemented. Farm inputs were subsidized, particularly for finance, fertilizer and transport. Price support schemes were developed to stabilize incomes, thus providing a more certain environment for farmers to increase production. The total package was believed necessary to ensure an incentive to increase production, and also to compensate farmers for increased costs caused by the protection of the domestic economy. Essentially the government was operating a one sided devaluation – export subsidies for exporters and incentives and subsidies for farmers, that masked the impact a fixed exchange rate policy was having on the economy.

Farm gate prices were affected through policies in four areas: exchange rate, processing and transport costs, product price support, and producer board regulations and performance. The fixed exchange rate policy isolated New Zealand from ruling international product prices, whilst direct product price support came initially through government funded income stabilization measures (Livestock Incentive Scheme 1976) and later through a system of Supplementary Minimum Prices in 1978. At the time some Producer Boards (Dairy, Apple & Pear, and Kiwifruit) served as single desk export sellers and directly affected prices received by farmers. Other boards (Meat, Wool) did not act as single desk sellers but supported their sectors with promotion and licencing arrangements. Also in 1976 a revised Producer Board stabilization scheme for meat was established to join the schemes already in place for wool and dairy products. The schemes were financed through accounts with the Reserve Bank at a concessional interest rate of 1%.The overall effect of the policy environment was for farmers to expand production of traditional products with little regard for cost or marketing. The processing and servicing sectors managed to capture a significant share of the government support.

In its drive for increased agricultural output the Government paid subsidies on fertilizer and lime, major inputs on New Zealand grassland farms, compensated for natural climatic disasters and in addition it subsidized the use of land and capital. The Land Development Encouragement Loans Scheme of 1978 encouraged the intensification of pastoral land and the development of marginal land in an unsustainable economic environment. Cheap subsidized interest rates and taxation advantages encouraged farmers to borrow unrealistic amounts of development finance and eventually precipitated a debt crisis.

By 1984 agriculture in New Zealand had become highly dependent on government support – equivalent to 30% of its total output (Appendix II) This level had been growing inexorably for more than a decade and had distorted the economy. Farmers had followed internal price signals even though at variance international ones. They had developed marginal land and pushed tax loss farming to its limits, and used excessive amounts of fertilizer. The processing and service sectors had become less efficient and the generous levels of government support were capitalized into the value of land creating a farm debt problem. New Zealand agriculture had lost its international competitiveness, a very dangerous situation for a country that exports approximately 80% of its agricultural output, especially when that output contributes more than 50% of merchandise exports. Something had to give and it did. The government changed and with it a new market driven philosophy becoming the ruling economic policy. A 20% devaluation was followed by a floating of the NZ dollar and significant changes in taxation policy. Agriculture along with the finance sector took the major hits and went through a 5 year period of "cold turkey" recovery from Government assistance.The latter half of the 1980's was devoted to a restructuring of the whole economy that has been well recorded in the literature. It was the period of "no gain without pain". It led a decade later to a radical change of political representation system.

In the context of this paper – Government Intervention in N.Z.Agriculture, the period 1882 to 1972 was dominated by Government support for land settlement as the colony developed to be followed by measures to stabilize product prices through the 1930's. Following World War II agriculture was increasingly relied on to support the development of manufacturing in an increasingly dual economy. That economy received a double shock in 1972 with Britain's entry to the EEC and the " Oil Shock" that followed shortly after. Direct subsidies to farmers became a growing part of their annual income so that by 198 the overall PSE figure had reached 34% on average and 90% on sheepmeat. The political and economic changes of the mid 1980's were, dramatic
and necessary, to stop farmers mainlining on the drug of Government support. Twenty years later the farmers would not want to return to the pre 1984 situation, they prefer the environment of clear price signals from the international food market and they have become accustomed to dealing with the vagaries of that market.

CHALLENGES FACING AGRICULTURE TODAY
META ANALYSIS OF EXPERT INTERVIEWS

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Abstract

Identification of the major trends that will impact on the agriculture operating environment in the next five to ten years was the first topic addressed in over 20 interviews with recognized experts from the USA, Australia, New Zealand, the United Kingdom, and Canada. They also identified the major challenges and opportunities that those trends created for farm operations, what skills and information could be of assistance to farm managers, and successful methods of delivery. Challenges and opportunities identified are: new crops and products, changing thinking to a market focus, using new technology, using appropriate business models, alliances & networks, succession strategies, benefiting from interdependence, and increased market volatility. Meeting these challenges and opportunities will require development of specific skills and sources of information. Delivery options included electronic means, but the importance of interaction between people was confirmed.

Keywords: challenges, opportunities, trends, interviews, skills, information

Introduction

Identification of the major trends that will impact on the agriculture operating environment in the next five to ten years was the first topic addressed in over 20 interviews with recognized experts from the USA, Australia, New Zealand, the United Kingdom, and Canada. They also identified the major challenges and opportunities that those trends created for farm operations, what skills and information could be of assistance to farm managers, and successful methods of delivery. Challenges and opportunities identified are: new crops and products, changing thinking to a market focus, using new technology, using appropriate business models, alliances & networks, succession strategies, benefiting from interdependence, and increased market volatility. Meeting these challenges and opportunities will require development of specific skills and sources of information. Delivery options included electronic means, but the importance of interaction between people was confirmed.

The interviews, lasting from 15 to 60 minutes, were conducted by telephone and in person with farmers, professors, farm management specialists, commodity organization staff, and consultants. Interviewees were selected for their global representation and expertise based on recommendations from International Farm Management Association (IFMA) Executive and Council Members and from the author's knowledge of people in the industry. The research project was commissioned by the Canadian Farm Business Management Council to provide background information for use in strategic planning.

The discussions were oriented around four basic questions:

- Future circumstances to be faced by farm managers in the next few years,
- Management challenges and opportunities resulting from the new circumstances,
- What skills or information could be used to support meeting the opportunities or challenges,
- Options for delivery of programs and information to Canadian managers.

The first two questions were the most significant and yielded the most ideas. The last two provided fewer ideas, but provided some valid insights into the challenges faced by program developers. As interviewees

made their key points, they often had illustrations or stories that helped to explain the message. Most of the discussions were recorded on computer, resulting in over 15 hours of material and many pages of notes. Key ideas were transferred to 3M sticky notes and grouped and sorted into similar concepts.

Trends and Future Circumstances

The primary conclusion was that farming will change at an increasing pace in the next few years, building on past changes. But, more specifically, how will it change?

- Consolidation of farm size and structural change will continue – as more larger farms produce an even greater proportion of total output. Middle sized operations are under the most pressure to remain viable, while smaller operations that have off-farm sources of family income will continue. There was some suggestion that the time lag of statistics gathering underestimates the rapid shift of production to larger farms. However, one specialist suggested that the total number of farms in the US is now stabilizing rather than continuing the downtrend. Although there may still be expansion in the numbers and sizes of larger farms these gains are offset by shrinking numbers and scale in the mid-sized operations. This consolidation process has farms growing in primary and value added enterprises, while others are downsizing or exiting in response to the long term price decline for non-subsidized primary commodities.
- The growing interest by others in what/how things are done in agriculture will be played out in increased regulation of practices, especially of animal care and environmental performance. These additional controls will require demonstration of compliance with expectations through assurance and traceability mechanisms. The anonymity that allows for shipping of inferior products, or ones produced with environmentally unsound or unsafe methods will not be tolerated.
- More volatility in markets will be faced. Not just for prices, but also for market access limitations, sometimes based on science, or often without science but founded in perception. Other volatility creators are disease issues and the ever present market disruptor of government policy. However, it is useful to remember that in the confusion of volatility, there is often a market to be found.
  Potential market shifts can be illustrated by the growth of ethanol production in the USA, surging in response to the government policy goal that a portion of fuels that must be ethanol. This surge led to a large jump in corn prices in 2006 as competition for the major feedstock of many new processing plants became apparent – potentially consuming up to 40% of corn production. This price increase for corn has impacted traditional users of this animal feed (beef, hogs, chickens, and dairy) in different ways as they try to adjust to increased costs and look for alternative energy sources. Some will adapt to use a by-product of the ethanol production – distillers dried grains which has different nutritional balances and requires new methods to be effectively used as a feed source. The surge in corn prices is felt beyond US animal feed users, as it also impacts human food users of corn and the price of the commodity on international markets. However, this major disruption of feed systems may not be for long as US government policy directs that the feedstock for ethanol production must shift to cellulitic (cellulose) digestion in five to seven years. If/when this shift to different plant product feedstocks (straw, trees, switchgrass) occurs, there will be a major release of corn back toward animal feeds, reducing the distillers grains sources.
- Population demographics is being played out as the baby boom generation moves through their life cycles. We are now shifting from a period of too many people in productive life stages to one of too few people to maintain the traditional systems we have built. This shortage of, and aging of, people will create challenges for staffing production processes, and governance of farm organizations, as well as challenges in the transfer of businesses between generations.
- Competitiveness of Canadian operations will be challenged by several factors. Emerging economies in the rest of the world with lower input and resource costs will challenge commodity agriculture. Multinational company strategy is based on mobility to migrate business operations to locations where $/brain economies are achieved. Global trade access to domestic and export

markets will be influenced by results of WTO negotiations. Competition with the rest of the economy as non-agriculture uses for land drives land values beyond normal productive values will force consideration of other ways of capitalizing operations.
This competition from emerging economies is illustrated by the financial market acceptance in New Zealand of share offerings to raise capital for investment in developing dairy operations in South America where costs of production are lower.

- The long term expectation of increased demand for food as populations continue to expand and wealth increases in developing markets was put forth by a UK farmer who tells his sons that they will one day be 'wanted' as food producers. This long term view is contrasted by the conundrum of the undernourished with no money to buy food and the growing obesity in developed countries.

Challenges and Opportunities

The trends and changes identified will create many new opportunities for farm businesses to benefit from if they adapt and modify their operations in line with the new realities. However, the changes will also create distress for others that choose not to adapt to the changes. The biggest challenge is to let go of some of the traditional views and approaches that are prevalent in the industry.

- New crops and products will create many opportunities for those that shift away from bulk commodities to value based marketing and chain connections. Thinking of productive capacity as a biological manufacturing plant will enable benefits from the bio-energy market.
- "BUT" in order to achieve some of the opportunities, there will have to be a change in mindsets and regulations. As a commodity organization manager put it "We have to figure out ways to encourage and facilitate new products instead of preventing change to protect old markets".
  For example, Canadian regulations requiring kernel visual identity is preventing development and availability of more productive crop varieties that could increase yields or meet specific market niches. The kernel identity requirements could be replaced by DNA testing and identity preservation of grains entering the market stream. A consultant in Saskatchewan where wheat is grown for export reports that it is four times faster and system wise cheaper to ship grain from the Canadian Prairies to export markets in containers loaded from the combine than by the traditional storage, accumulation, elevation and bulk railway cars system. It also provides for more effective identity preservation and traceability. But, so far, there is limited uptake of the methodology.
- Changing thinking to a market focus from a production focus was the most mentioned challenge and opportunity. Thinking about and meeting 'what a market wants' opens up niches and focussed product opportunities. Gone are the days where the business strategy of growing a commodity and then hoping that some one will want it enough to buy it at a profitable price will assure success.
- New technology and biotechnology developments will create opportunities and challenges. Technology can be your best friend or worst enemy depending on how it is handled and plays out. Being able to determine when is the right time to invest and employ new technology – when early use profits can be captured, but not before early development costs eat profit potential or after it becomes a necessity to remain competitive will be a contributor to success. Applying science to systems can provide benefits – for example, testing can be done on barley to assess its value as a pork feedstock, allowing greater feed efficiencies to be achieved and productive value to be reflected back to the grower.
- Developing appropriate business models was noted as a challenge and opportunity to deal with future circumstances. Some operators are achieving larger scale of their systems by developing a production and management system for an effective size and then replicating it at other locations or sites. Others are co-operating with others to operate larger scale operations that can achieve economies, for example, three people going together to build a larger dairy barn.
- Achieving appropriate farm to off-farm alliances and interfaces is another challenge and opportunity. In some cases, co-operation with local business people can enhance operations. The

depopulation of rural areas will not be reversed by encouraging more farmers, but it might be with more workers involved in value adding activities. Unfortunately, rural development is often at odds with large scale commodity agriculture. Bottom line advice is that people cannot wait for others to develop opportunities – we have to do it for ourselves.

- The succession or transition of business operations between generations is also recognized as a challenge and opportunity depending on how it is approached. A significant question is whether the major wealth transfer about to take place can be achieved in such a way to facilitate continued investment in agriculture.
- Interdependence is a benchmark for future success. Research in Canada identified that all the top managers have alliances. They concentrate on what they do well, and hire the rest. To achieve successful interdependence requires communication, a new skill and attitude for many operators.
- Exit strategy planning can be a challenge or opportunity depending on how it is managed. Many people grow operations without planning on how or when is the time to move on to other opportunities. Successful exit depends on correct reading of leading indicators – when was the right time to get out of the ostrich business, or when will be the right time to scale back dependence on ethanol and distillers grains given stated government policy.
- The business climate in North America has a contracting capacity facilitated by legal systems that may be missing for some competitors. It may provide an opportunity to build more integrated value chains.

Skills and Information Needs

The above noted trends and the associated challenges or opportunities provide an environment where new skills and information processing capacity are crucial components of success for farm managers.

- Understanding the market closely follows the opportunity to shift to a market from a production focus. This key concept of knowing what consumers want and will pay for was noted many times.
- The necessity of interpreting macro trends down to the micro situation is a key skill and information need. Understanding the tipping point concept and being able to interpret signals about when it will kick in depends on information sources reporting implications, not just prices.
- Asset and portfolio management by knowing where, what and when to invest the large volumes of funds required by some production systems will be a significant skill requiring solid information sources.
- Risk, financial and marketing management are key skill areas flowing from the increased market volatility and larger scale operations on the horizon. It is necessary to know costs of production, return on investment, and how to manage risks. Interviewees talked about total enterprise risk management, not just crops and livestock risks. Very often, government support programs have the tendency to not give credit to the total enterprise as they support the status quo in preference to the changes that are more in line with future opportunities. Marketing skills are more important for niche and special valued products. Lots of money is left on the table by many commodity producers not paying enough attention to marketing.
- People skills to deal with greater interdependence will differentiate future success. The interdependence forces more relationships with employees, partners, suppliers, customers, and successors. Achieving preferred customer or supplier status depends on relationships built on people skills. Even the few sole operators who have no employees need skills to deal with suppliers and purchasers.

  An example of employee relations is the US mid-west farm manager with three employees. During harvest, they take turns on three shifts each 24 hours, first shift is on the combine, second trucking, and third sleeping. The manager fills in for his employees to enable them to participate in family events like children's sports games.

- The capacity to make fast changes was noted several times as a strategy to deal with opportunities and challenges. The goal is to be able to learn and adapt to change faster than the competition to keep up with the pace of change – recall the bio-fuels example above. Creativity and innovation skills will also be useful.
- Generic business skills at a post secondary level are noted as needed. Many of the business issues in agriculture are not much different from those faced by other businesses.
- Information management is needed to sort through biased information sources and deal with the overload, sorting wheat from the chaff.
- Maintaining a CEO focus with big picture thinking is necessary. Skills in strategic planning, how to grow the business and oneself, as well as goal setting – knowing where you want to be and then positioning to get there will be valued. Systematizing the strategic decision process is necessary to be confident that "I am doing the right thing" amongst the many opportunities that are available.
- Managing under increasing regulations, external control and influence is another skill required to meet quality specifications and environmental rules.

Delivery Opportunities

Identifying methods to reach managers with information and to support skill building to deal with the challenges and opportunities is a real challenge for program managers. No 'ah ha' options were identified, but some suggestions about characteristics to be considered were noted.

- Electronic methods using the Internet and/or DVD systems are an option **BUT** they have significant shortcomings as many interviewees note the requirement for personal interaction in developing the higher level management skills required. Electronic methods are being effectively employed for short technical learning – as is illustrated by lunch hour telephone discussions/presentations with Nebraska hog barn employees.
- Some opportunities to develop personal face to face relationships are necessary for trust building prior to benefiting from electronic support was viewed as a necessary requirement in program planning when more complex management skills or understanding are to be developed.
- Group activities hold potential for peer-to-peer networks, analysis of farm records and are demonstrated by the top management groups in the CTEAM program in Canada and TPAP in Texas, USA.
- Challenges to provide contacts and development to younger farmers were noted. Internet communication after face to face trust is developed should be tested. As younger people may be more comfortable with electronic personal relationships, there may be opportunities to achieve connections. Another option is to use events with 'hooks' like the current interest in bio-fuels to get younger people involved. A key goal must be to get them off the farm to become more aware of wider issues and opportunities. As the commodity organization manager puts it, he tries to prevent the "stay home – stay stupid" syndrome by getting his younger organization officers the chance to experience learning trips as soon as they are elected.
- Farm families are not homogeneous must be a key principle for program developers. One size fits all approaches are not effective. This leads to the advice to program developers to be clear on the market segments and priorities they are targeting.
- Since the human tendency is to remain where we are comfortable, programs need to overcompensate to push people beyond their comfort zones into position to accommodate challenges they are faced with. If programmers only push weakly, people will go back to where they were comfortable and not gain the benefit of the changes.

Conclusions

Change will continue. Its pace will increase. For some, it will feel like the speed is being turned up on the treadmill they are running on. The new circumstances facing agriculture will provide great opportunities for those that adapt and pain for those that do not adjust.

Dealing with and thriving in/with new conditions, products, regulations, customers, partners, technology, markets, and suppliers creates new opportunities and requires new skills and information sources. However, for those managers able to take the CEO viewpoint, and develop their business to meet customer and market expectations, significant success is available.

Note:

In conjunction with the Canadian Farm Business management Council, the author is investigating the feasibility of converting the audio files of discussions with interviewees to a format for Podcasting from the CFBMC website. If it proves feasible, some of the audio files of discussions in the research project should be able to be found on www.farmcenter.com by the fall of 2007.

A VIBRANT RURAL ECONOMY IN THE 21ST CENTURY – AN ETHIOPIAN PERSPECTIVE.

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Abstract

The author was assigned to the city of Awassa in Southern Ethiopia in late 2006 to advise on "urban agriculture". Land within the city limits is allocated to investors both in agriculture and other industries. I concentrated my efforts on the dairy sector, where it became apparent that encouraging the development of milk production within the city should maybe not be a priority. This was vividly brought home to me when I accompanied the members of an NGO in the distribution of goats for humanitarian aid to farmers just 10 km from the centre of Awassa, a city having over 100,000 inhabitants. What's more the community was located on the shores of the 100 sq km Lake Awassa. With such a favourable situation and a large expanding market on their doorstep why are these farmers not amongst the most prosperous rural dwellers in the area? The reasons I attempt to address in this paper.

Keywords: urban agriculture, development

Introduction

The author recently came across the 'stupid cow syndrome' in an article on 'demand chains' which seems relevant to the subject at hand. Basically this runs as follows: "complaints are made to tanneries on the low quality of leather who then blame slaughter houses for the poor preparation of hides. They in turn blame the farmers for the poor quality of cattle; however the farmers say we can't help it and blame the 'poor old cow' for scratching itself on barbed wire fencing".

The subject of this paper are based on the author's brief visit to Ethiopia towards the end of 2006 and the above reference appears to reflect his conclusions.

Background

The visit to Ethiopia which took place in October/November 2006, was a one month assignment on behalf of the U.K. volunteer organisation VSO. The mission was to investigate 'urban agriculture' in the city of Awassa the capital of the Southern People's Region in the south of the Country. Following a short briefing in Addis Ababa, three weeks were spent in Awassa which lies one third of the way towards the Kenyan border about 270 km south of the capital in the Rift Valley on the shores of a picturesque lake which bears it's name. During the final week on my return trip, a short stop was made at Ziway another large lake about 100 km before Addis and the last few days visiting various organisations and a large dairy processing unit in the capital itself. Throughout this assignment the marvellous hospitality and support received seemed completely at odds with the apparent backwardness of the rural areas in this wonderful Country. The paradox is that although it possesses the largest cattle population of any Country in Africa many urban dwellers do not appear to have good access to milk or other dairy products. Other daily requirements such as fruit and vegetables are sometimes transported long distances though suitable growing conditions may be close at hand. Much has been recorded on the reasons for this situation and the reader is referred to the references listed to learn more.

A Short History

The writer first visited Ethiopia in 1969 whilst proceeding on leave from Kenya. The purpose was to visit a colleague with whom he had studied for the postgraduate Diploma in Tropical Agriculture at the University of the West Indies in Trinidad three years previously. Hans Johannson was a member of a Swedish team working on the Chilalo Agricultural Development Unit (CADU) which was funded by the Swedish Development Agency (SIDA) and became very well known throughout the developing world as a front runner in investigating and implementing strategies for rural development. Hans was based in the Arsi region very near to Awassa and the abiding memory of that time were the vast herds of cattle yet the difficulty of obtaining fresh milk and a rather memorable horse riding experience – horses being very important for transport in Ethiopia. The objectives of the project included: (i) the achievement of economic and social development throughout the project area; (ii) the continued search for suitable methods to bring about agricultural development in Ethiopia when applied in an integrated manner; and (iii) the creation of possibilities for application elsewhere in the Country. In fact the project continued well into the 1980s, was replicated by others, one of which was the Welaita Agricultural Development Unit in Shewa and could be considered to have a fair degree of success. Unfortunately in surveys carried out later it does not seem to have had any great effect on rural poverty with those farmers living in the former project area apparently being no better off than those elsewhere. This may be due to other events during the period of the Derg. Also of course, Ethiopia gained the attention of the world during the dreadful famines of the mid 1980s though their main focus was in the north of the Country. A huge number of International Aid organisations initiated activities at that time and many of them are still operating to this day. This begs the question as to why has there not been a dramatic improvement in the well-being of the rural population as one might expect from these well intended interventions.

Awassa At The Dawn Of The Millennium

According to the Ethiopian calendar the new millennium will commence in what is August 2007 in the conventional calendar. With just one month to go this is perhaps a very appropriate moment to assess the city's current position. Arriving in Awassa towards the end of the rainy season, which is slightly later than further north, it was impressive to approach the city during a heavy rainstorm following travel through hot, dry country. Indeed the countryside for the last 50km was relatively green.

The next pleasant surprise was that the accommodation provided was a small pleasant hotel with a modern gym and meeting hall attached. Within 400m were facilities for all efficient communication needs, digital photos download and printing and ready transport by taxi or gari (horse drawn cart) to any part of the city. ONGOing road development is impressive with broad paved streets set out on a block basis on which the taxis run, whilst on the dirt (rather dusty!) smaller thoroughfares linking them, the gari was the best option. One very good legacy of the brief Italian occupation are the coffee shops with cakes and pastries. Later in travelling further afield it was possible to appreciate the 'ribbon development'. For example on one street about 2km in length, one end with finished buildings of shops, businesses and houses graduated through just completed buildings to the far end where construction was very much in progress. From a nearby hill it is apparently possible to look down on the city and to see the road network laid out in a pattern reflecting the initials of Haile Selassie. He had a palace not far distant on the lake and this was one of his favourite retreats.

Awassa Urban Agriculture Development

The assignment was through REMSEDA which is the regional body responsible for micro and small enterprise development. Immediate superiors were the Awassa City Administration (ACA) with temporary offices in the bus station but for the purposes of the assignment office space was provided at a

nearby vocational training centre which came under their auspices and enabled a much easier working environment.

At this point it is useful to consider the resources that were available in the City to obtain the background information for the task.
There is an excellent Research Station which was within easy walking distance which does impressive work within the Southern Region. This area is one of the most favourable for enset (false banana) a plant peculiar to Ethiopia and considerable work has been done on it's value in providing food security for rural families. Of particular interest was the favourable interaction of this crop and livestock. The station has small plots near their HQ in town and a larger area of land near the main university.

The Agricultural University is also in the centre of town boasting an attractive campus and a large student intake. The total number of students at this and the large modern campus of Debub University on the edge of town is well over eight thousand contributing to Awassa's reputation as a young rapidly developing city. A notable feature of Brazil, where the last IFMA meeting took place, was that young people still consider there to be a worthwhile career in agriculture with appropriate courses well filled (c.f. the present situation in many Western economies) and the same could be said for Ethiopia.

Urban Agriculture

In such a brief stay it was decided that the dairy industry was perhaps the most important sector that needed addressing, so efforts were directed to that end though a cursory look was extended to other activities. In effect the ACA has control over land within the City boundaries and is empowered to allocate it to businesses and enterprises which it considers to be of major priority for the City development, taking into account planning and environmental considerations. There were two major inputs in the dairy sector: (i) NGO supported milk production by Women's Groups, (ii) private investment in dairy units by individuals. Two examples of each of these were studied.

(i) The Groups visited were located to the north west of the city, not too distant from farm land and near the main highway. Thus access was good. In fact there is a cluster of NGO supported enterprises located adjacent to each other. The two examined in detail were quite similar to each other. Both had substantial buildings capable of housing about ten cows but which were dark, poorly ventilated and not considered to be a good use of funds. One Group was being badly advised on feeding by their extension agent and water was not available 24hrs for the housed animals. These were management criticisms but perhaps more pertinent is doubt about the system in general. Almost all the roughage feed which at that time consisted of maize stover and cereal straw had to be carted and disposal of manure would soon be a problem. However these issues could be even more of a drawback for the other private investments.

(ii) These were located to the south west of the city, reached through intense urban development and backing onto the hills. They were planned for around 50 cows each. Thus the environmental aspects are likely to be a problem and the plans to put in a pasteurising unit by one of the Groups was debatable in terms of the location as it would be hardly practicable to transport milk from outside. Water was being sourced from a new well and this could have implications for the supply to the city even though it is near the lake shore.

There are two other general points. Firstly the land for these enterprises is subject to reallocation should the ACA decide that a site is needed for a more lucrative industrial producer (there is already a large textile factory in the city) so there is no guarantee of tenure. Secondly milk is in exceedingly short supply within the city with most deliveries of raw milk being door to door through the informal sector, the price being 20 – 25% higher than in areas where supply better meets demand. Thus there must be a question

mark over whether people are prepared to pay a higher price for processed milk until production has been raised and the price of raw milk comes down.

Other urban agricultural development was very much dominated by NGO finance.

Some of these were excellent and here one can single out a local one – JeCCDO, Jerusalem Children and Community Development Organisation which has a fairly recently opened branch in Awassa. Their annual report for 2004 has a photo of British prime minister Tony Blair visiting one of their demonstration gardens near Addis Ababa: though this generated considerable media exposure and publicity there was no direct funding increase from the U.K.'s overseas aid programme! Urban agriculture is one of their community based child care activities it was stimulating to be taken to see some of their beneficiaries in town who on pocket sized areas of land next to their houses were keeping chickens or growing vegetables with extension input from their staff.

Another NGO supported by USAID funding were in the process of replicating a micro irrigation project that had been successful around Addis Ababa. Their urban agriculture programme was aimed at HIV affected women who were organised into Groups and provided with drip irrigation equipment plus inputs and extension advice. Criticised by some for doubts over the sustainability of using imported equipment, they are in the process of trying to identify a local manufacturer. From the pictures seen it was certainly having a huge immediate impact on people's lives.

In terms of the author's understanding of urban agriculture, these two latter example are exactly what fits the bill and were already receiving good input from these and other NGOs.

Rural Development

Although not within the remit of the assignment, advantage was taken of an offer of two visits to the surrounding rural communities at weekends. The first embarking from the Research Station, was a chance encounter one Saturday morning and entailed a trip of 50 km to the western side of the lake to look at some soyabean trial plots on small farms. These were being managed by Self Help International an NGO funded by Irish Aid who have a large financial input into Southern Ethiopia. There was a very impressive turnout with the National Director of Research with many of his staff plus Ministry of Agriculture and other NGO extension staff and the sites and whole day's outing organised in a very efficient and professional manner with a television film crew on hand also.

Two weeks later as a guest of GOAL (another Irish NGO) a much shorter trip was made to a community located just outside the City boundary (less than 15km from the centre) on the lake shore to observe the distribution of meat goats to provide the farmers with income generating potential.

Other NGOs who work in rural development include Farm Africa, World Vision, SOS Sahel, SNV all of whom are international. There are also many smaller local ones doing equally good work.

Commercial

Just 20km from Awassa at Melge Wendo was the other face of Ethiopian Agriculture in the form of a meat and vegetable factory. The slaughter house was another legacy of the Italian occupation, built in the late 1930s It was well managed and though the facility is somewhat dated the cleanliness and hygiene standards were impressive. A mob of cattle in the holding pens waiting for slaughter were of very good quality. Run by the El Fora company which has marketing outlets to Countries in the Middle and Far

East, the facilities were taken over from Government about 10 years ago and El Fora has similar investment in other areas of the Country also.

Back in town, checking on the availability of feeds for cattle, a government-run mill and a private enterprise were visited. The former though very well run and the manager was to be commended, were hampered by the usual bureaucracy and having to pay their taxes (as he lamented!) such that they were only running at about one quarter of their capacity. They could not compete with the dozen or so private mills which have sprung up and are easily able to undercut prices.

Ziway Experience

This is another lake in the drier part of the Rift Valley but where there has been some development of irrigation. It is in fact a supplier of vegetables to Awassa as had been evidenced in their city market previously. The SEDA project was visited on the shores of the lake where a joint operation between U.S. based 'Heifer International' and U.K. based 'Send a Cow' is providing credit in kind by the provision of heifers to small farmers. This author's presentation during the last IFMA meeting in Brazil on similar work in Western Kenya explains how the system works. Here development is more recent but progressing well.

Again there is a huge contrast and some element of competition with a large development on the Western shore of the lake by a Dutch company to produce flowers for the European market. The building of polytunnels proceeds apace with the objective of eventually covering 360 ha when at full capacity. The company is investing in local facilities including schools and health centres for it's many employees. Provided there is careful regulation, so that there is limited damage to the environment and supervised control of water use, the positive side is that about four thousand people are employed who apart from earning a very good income have been provided by the company with a school, health centre and recreation facilities.

Dairy Development Enterprise – Addis Ababa

A State run milk processing factory in the city, it was visited on behalf of a colleague who had been carrying out a similar task to myself in the Capital city.

Pasteurising and packaging milk and producing butter, yoghurt and cheese it was again encouraging to see a public enterprise so well managed. At the time they had an intake of 22,000 litres of milk per day from the surrounding hinterland including producers large and small. The manager was to be congratulated on the good hygiene but he admitted one problem that I had not come across elsewhere in Africa previously, which was the fact that Ethiopia has almost 200 fasting days throughout the year during which the predominantly Muslim population are not permitted to drink milk. There is a limit to the amount of milk that can be made into cheese etc so the alternative is to package UHT (long life) milk for which new investment was required. An up to date packaging machine for the ordinary milk had been installed not long previously but the source of funding for this new initiative had not yet been found. With private dairies springing up in the vicinity one could see a similar situation developing: private versus public as was the case with the flour mills in Awassa.

Discussions were later held with SNV (Netherlands Development Organisation) who are implementing improvements to the milk supply chain as part of a European Union funded programme named BOAM. This is an acronym for 'support to business organisations and their access to markets'. Under this programme cereals and dairy were being covered in Oromia Region and pineapples and honey production in the Awassa area.

Summary

In order to provide some positive messages to REMSEDA it was considered necessary to "think outside the box" which was made possible by the 'extra' visits were made and not provided for at the outset of the placement.

The suggestion was made that before too much attention is given to processing requirements, the production of milk from the rural areas should be increased until the liquid market in Awassa was satisfied and the price stabilized at the leves seen elsewhere. There are two ways in which this can be addressed fairly quickly. Firstly by increasing the number of higher producing animals on small farms through the 'pass-on' schemes of the NGOs as is already in operation at Ziway. There is a strong chance that the Heifer/Send a Cow partnership will extend their activities to this area in the near future as they already have another project further south in Arba Minch and it is their intention to concentrate activities in Oromia and the SNNP regions.

Secondly: increased extension input in the rural areas would be necessary and it was suggested to VSO that they might consider some longer term volunteers supporting the extension services in this respect.

Conclusion

The title of this paper seems to be at odds with the task which the author was asked to perform but in long experience of working in Africa the gulf between urban and rural development has never appeared to be more pronounced. On reflection it is perhaps relevant to consider the situation in neighbouring East African Countries. In Kenya for example, everyone has a 'shamba' (farm) in the rural areas and on retirement the high fliers from the cities usually return to their home areas where they often use their skills to promote development. Thus there are often good health centres, schools, services such as piped water and electricity and generally a high standard of living. However in Ethiopia it appears to be somewhat of a vicious circle. Lack of infrastructure outside of the urban areas means that there is little incentive to 'move back' so that the gulf gets wider.

One other suggestion was that every opportunity should be taken to facilitate exchange of personnel between Kenya and Ethiopia for example. Each has a lot to offer to the other.

As to why it was necessary to distribute animals in what is to all intents and purposes humanitarian aid on the outskirts of a city the size of Awassa despite all the historical and political reasons remains a mystery. With the talented people, the well founded institutions and productive countryside Ethiopia seems to have everything going for it. Perhaps the question should be asked of that 'poor old cow'!

One final footnote: as an acknowledgement of the hospitality and friendships made on this assignment the author's wish was to do a little more to assist Awassa in it's impressive development. Many people in his home city of Bath in the U.K. know that H.E. Haile Selassie lived in Bath in exile during the second world war. He was such a gentleman that his presence is still fondly remembered. Near to Awassa is a much visited spa and Bath is famous for its own spa. Both cities are of a similar size and have very progressive Universities. Thus attempts are being made to see if some kind of partnership can be established which could be to the benefit of both cities for the present and new millenniums.

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THE LAND REFORM PROCESS IN SOUTH AFRICA WITH THE EMPHASIS ON LAND RESTITUTION

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Abstract

Ownership or title to land in many countries of the world is a very contentious topic. Wars and battles have been fought over these rights and have caused the demise and instability of many countries, particularly in Africa. South African democratic elections in 1994 produced a Land Reform policy to redress the injustices of forced removals and the historical denial of access to land of black people. A target has been set, 30% of all white owned land is to change hands to blacks by the year 2014. The 3 key elements of the Land Reform programme are 1) Restitution (Land Claims), 2) Redistribution and 3) Land Tenure. This paper will briefly touch on the processes of Redistribution and Land Tenure but will highlight many of the challenges of Restitution or Land Claims in South Africa.

Keywords: land reform, restitution, land claims, reconciliation and food security.

Introduction

Throughout the history of mankind, many battles have been fought for the rights of use of land resulting in death and destruction to people and property. In the context of South Africa, democracy prevailed over the apartheid era with the 1994 elections. A brand new constitution of the Republic of South Africa 1996 (Act 108 of 1996) was enacted by the Parliament of the Republic of South Africa. One of the corner stones of the South African Constitution is Section 25, which deals with property rights, and the current Land Reform programme emanated from that principle of the constitution. Section 25(6) of the Constitution states that: "A person or community whose tenure of land is legally insecure as a result of past racially discriminatory laws or practices is entitled to the extent provided by an Act of parliament, either to tenure which is legally secure or to comparable redress". Section 25(6) of the Constitution also provides that: "The State must take reasonable legislative and other measures, within its available resources, to foster conditions which enables citizens to gain access to land on an equitable basis".

The Objective of the Land Reform policy is to address the following issues:

- The injustices of racially based land dispossession of the past
- The need for a more equitable distribution of land ownership
- Security of tenure for all.
- The need for land reform to reduce poverty and contribute to economic growth

The Government also set a target of 30% for its land reform policy i.e. 30% of all white owned land to be transferred to the disadvantaged by the year 2014. In order to achieve this, a Land Reform programme was put in place. This programme has three legs:

- *Land Restitution*:
  One of the very first pieces of legislation that the new government promulgated was the Restitution Act No. 22 of 1994 as amended. The main aim of the Act was to provide for the restitution of land rights to persons or communities dispossessed after 19 June 1913 as a result of past racial discriminatory laws or practices. (Since the *Natives Land Act, 1913*, rights to own, rent or even share-crop land in South Africa depended upon a person's racial classification).

- *Redistribution*:
  This aims to provide the previously disadvantaged and the poor with access to land for residential and productive purposes by means of support and grants.

- *Land Tenure reform*:
  This is to improve the tenure security of all South Africans and to accommodate diverse forms of land tenure, including types of communal tenure or ownership.

This paper focuses on the difficulties associated with Land Restitution in South Africa, and also discusses progress with land reform in the South African Sugar Industry.

Land Restitution And Challenges Faced In South Africa

Restitution Of Land Rights Act No. 22 Of 1994 As Amended Is:

- To provide for the restitution of rights in land to persons or communities dispossessed of such rights on or after 19 June 1913 as a result of past racially discriminatory laws or practices and, to establish the Commission on Restitution of Land Rights (the Commission) and the Land Claims Court (LCC), to provide for matters connected therewith.

A "Land Right**"** means "any right in land whether registered or unregistered, and may include interests of a labour tenant and sharecropper, a customary law interest, the interests of a beneficiary under a trust arrangement and beneficial occupation for a continuous period…." These rights are known as beneficiary occupation rights. They could be rights in the form of cropping use, residential, hunting or even firewood collection. Should a person's rights be taken away by racial means then that person has a right to claim.

Land Claims are against the State and not, as perceived by many, the landowner.

There are various ways of settling valid claims i.e. land restoration, provide alternate land and financial compensation or /and any equitable redress. Urban claims have been much easier for the Commission to resolve than rural claims as most urban claimants opt for financial compensation. For rural claims though, restoration of claimed land or alternate land is the most preferred option by the claimants thus affecting existing landowners directly. Rural claim settlements are, and have been, relatively slow due to the complexities of validation, negotiation and land transfer. Presently the state is paying market related prices, which is in line with the SA Constitution.

In order to initiate the process of restitution, all Land Claims needed to be registered by the 31 December 1998. Claims were separated into urban and rural by definition, of a total of ***79,696*** registered claims in South Africa, ***14,856*** or 19% were rural and ***64,840*** or 81% urban. By 2006, ***71,646*** claims had been

settled of which only ***7,881*** or 11% were rural so the vast majority of settled or claims were urban (98% of all urban claims).

Due to the complexity of settlement of rural claims, government has had to extend their original target date of 2005 to the 31 March 2008. It looks like this deadline is to be extended again. Claims are registered against the state and each claim is investigated by the Commission to ensure it conforms to the rules of restitution. Once confirmed as valid, the claim is gazetted with the associated land identified. Stakeholders then have 60 days to respond to the gazette notice to accept or challenge the validity of the gazetted land claim.

Presently, the Commission is using the traditional willing seller/willing buyer approach to acquire claimed properties. The Restitution Act Section 42(E) empowers the Minister to expropriate land or right in land for land reform purpose. The purpose of the Act is to expedite the settlement of land claims when negotiations have failed. Obviously the expropriation route will also have its own challenges.

The following points discuss some of the direct challenges facing the settlement of rural land claims:

- Gazetted landowners, or farmers, generally not only derive their income from the land but also live on their farms, they have their homes there. Many families go back generations in building up their family farm unit so emotions play a massive role in the process of restitution, to move off land that has had so much personal and family input, capital injection, risk taking, effort and sense of achievement tends to harden farmers to this process.

- Gazetted claims have tended to be gazetted in bulk and most rural claims are "community" based claims. These claims tend to go from one river or feature to another and everything in between is deemed to be valid. Some farmers may have farms overlapping two or more claims complicating the situation. A community-based claim has its own complications, were the rights the same for one and all for each piece of land?

- Only the LCC can conclude correct validation of any claim, and that in itself takes money and time. There is a waiting list of up to two years for a LCC appearance should any one claim be challenged.

- Each affected landowner has his/her own needs and opinions so this process is and has split farming communities in groups. One common example is where some owners feel that the gazetted claim is not valid and they wish to pursue for a decision by the LCC, obviously costing money. This group wishes that all affected owners remain and fight as a unit. The other group, however, may feel that they have an opportunity to sell their land at market value due to personal reasons, such as financial status, and do not want to go down the route of challenging the validity of the claim. This situation is common and has resulted in nasty confrontations amongst farmers.

- The biggest complaint by gazetted landowners is the lack of communication or response by the Commission. Once the claim is gazetted and the farms identified, the Commission tends to move their resources onto the next claim. Land Claims is very sensitive for both claimants and landowners and should be treated as such. Correspondence from landowners asking questions and offering possible solutions frequently get no response from the Commission. The Commission is very wary of Lawyers

- There is high staff turnover in the Commission as the settlement deadline approaches. This poses a challenge in communication and interaction between the farmers and staff members. Landowners are accusing the Commission of dragging its heels to prolong employment but as there is a target date they need to perform.

- The Commission has not investigated all the registered claims. There are still many rural claims outstanding; landowners are therefore very reluctant to invest capital in their farms even though their farms are not presently gazetted. Growth has virtually stopped and it will only be when all claims are settled that this trend will reverse.

- Many of the rural claimants are illiterate and thus take time to produce the required documents. Construction of family trees, recording of minutes and important resolutions becomes a serious problem.

- Infrastructure and communication problems make it difficult to access claimants and to hold meetings. Distances to be travelled and the condition of rural roads pose a challenge.

- Determination of the monetary value of the claim and the development projects to be linked to the restitution award is problematical.

- High cost of farmland – productive farmland is expensive and the process of Governments purchase of the land for redistribution is expensive, which can lead to drawn out negotiations due to differing expectations between buyer (the State) and seller (the owner of the land under claim).

- In addition to the price, other issues around the transfer agreement that take time to resolve include agreement of the beneficiaries, validity of the claim, the rightful claimants, the extent of land (property description) land use, settlement etc.

The next real challenge comes after claims have been settled – the ***"Post Settlement"*** phase. The sugar cane industry in South Africa is reliant on the supply of cane in an area to a specific crushing mill. As an example the Umzimkulu Mill situated south of Durban relies on 30 000 hectares under cane for their cane supply of 1 200 000 tons of sugar cane. The mill has a breakeven point of approximately 1 000 000 tons so, should cane supply be reduced by 200 000 tons or 5 000 hectares then the uneconomic mill will close down affecting the existing food supply, 5 000 workers, their 30 000 dependants and many local small and medium businesses. Nobody can afford for this to happen.

"Post Settlement" is something the local commercial growers, in this case, are taking very seriously. The whole existence of the sugar industry in above rural areas is dependent upon the business of farming sugarcane. Claimants generally do not have any agricultural or business background so the challenge is for the business of farming to continue as before even though there are new owners of the land.

Presently, the mill and grower leadership are in talks with the Post Settlement division of the Commission to ensure continuity into the future of cane growing. This is a critical phase of restitution as whole cane farms can be destroyed within a few seasons without correct farming husbandry. Inexperienced farmers without the necessary agronomic, financial and labour management skills will jeopardise cane supply in the area. These skills need to be built up before taking on the responsibility of farming. Farming is not only for oneself but there is a responsibility for the community as a whole and also a social responsibility for labour and their dependents.

As the Commission would like to see potential black farmers get opportunities several models are presently being investigated. The one being looked at very carefully is a joint venture type model whereby the community, or trust, pools the land and the equipment, and management expertise is supplied by an experienced farmer to farm jointly with profit sharing.

Another model is for a lease back with a specific condition of empowerment. The outgoing farmer and claimants identify some individuals to understudy the manager of the farm. Once the lease expires the mentored individuals will take over the running of the farm.

Due to the nature of the Restitution Act, the State prohibits the claimants to sell, exchange or donate their restored land in perpetuity. The claimants may lease the property. This land is held by the legal entity on behalf of the beneficiaries. In a business sense this approach has challenges. One can understand that this prevents profiteering but it also poses a challenge to the farming unit should one want to raise capital due to unforeseen circumstances, development, change in use, or to grow the farm business. In the sugar industry, cane roots last for approximately 10 years before replanting and the farm gets into an annual planting cycle of 10%, however should a massive drought occur and the roots die off there needs be to a massive capital injection to replant the area. With no capital available due to the state's rules, the claimants will not be able to raise the necessary finance to get the farm back to where it was and the farm will resort to scrub land with cane supply lost. The phenomenon of roots dying actually happened during the prolonged drought between the years 1992 – 1994. During that drought farmers could mortgage their land to raise capital to replant their affected areas.

Landowners are fully aware of the land grab situation in Zimbabwe, South Africa's neighbour, resulting in the eviction of landowners from the land. Experienced farmers have left that country for good and now Zimbabwe is reliant on other countries to help feed its people. Land is a very emotional issue, the rights to land, whether by title or other, needs to be separated from the *business of farming*. On the one side, the new landowner, in the case of restitution, needs to ensure the continuity of the business of farming, on the other side the experienced and educated farmers need to assist in the upliftment of the previously disadvantage. When a claimant has a farm handed over to him his outlook and responsibilities to himself and his community will change significantly and he must be able to understand this and apply himself to ensure the farm does not collapse. Existing landowners also have a responsibility by assisting or mentoring new farmers by setting up so called "joint ventures" or similar arrangements, and making their experience and expertise available to ensure the success of the new farmers and their farm business.

Land Reform Progress In The South African Sugar Industry

The South African Sugar Industry is committed to transformation in land ownership and supports Government's target to transfer 30% of freehold cane land to Previously Disadvantaged Individuals (PDIs) by 2014 through the use of the land market under the willing buyer/willing seller principle. The Inkezo Land Company, a land reform company developed by sugar grower and miller leadership was founded in 2004 to assist the industry in supporting this target. The company, while initially funded by the industry, is operating as an independent land reform initiative. Inkezo assists in identifying sellers and buyers, streamlining processes of land reform and promoting sustainability through outsourced support service providers and mentorship programmes with existing farmers. In addition to Inkezo, the milling companies have been undertaking land reform projects for several years, which have seen an increase in the number of PDI growers and a new PDI miller on freehold sugarcane land. This section of the paper summarises the trends in land ownership transformation in the South African Sugar Industry.

The Industry consists of 3 different classifications of growers, namely, Large Scale Growers (LSG), Miller Cum Planters (MCP) and Small Scale Growers (SSGs). The total Area Under Cane (AUC) for the 2005/06 season is estimated to be 423 960 hectares. The SSGs (who are almost all PDIs) farm on about 75000 hectares of "tribal" land (communal tenure) and are not considered to be commercial growers and hence are not included in the total transformation statistics. Table 1 below shows the comparative land ownership statistics of the different grower types between 1999 and 2005. In the table, some LSGs did not indicate a race.

Table 1: Land ownership of grower categories – a comparison of 1999 and 2005 AUC (measured in hectares)

	MCP	White LSG	PDI LSG	Unspecified LSG	Total LSG	Industry Total*
1999	57 035	263 313	13 244	5 213	281 770	338 806
2005	39 051	270 435	37 676	984	309 095	348 146

* - Excluding SSGs

The table highlights the increase in AUC farmed by PDI growers since 1999 from 13 244 ha to 37 676 ha in 2005 representing an increase of 24 432 ha or 184%. The average year on year increase has been 19%. The proportion of total LSG land owned by PDI growers has increased from 4.7% in 1999 to 12.2% in 2005 – an average increase of 1.25 percentage points per annum. If the rate of transformation continues at this average pace, the proportion of PDI growers will only reach 23.4% by 2014.

The previous rate of ownership changes includes transfers from MCPs to emerging growers – where the milling companies proactively began selling off their estate land to PDI growers – with transfers of land from white LSGs only starting to move more rapidly to PDI growers in recent years. In addition, although land restitution results in a transfer of land to PDI growers, the process has been slow due to the challenges outlined in the previous section and many potential land transfers from white to PDI growers have been thwarted by unresolved land claims over the property subject to transfer. This means that with less MCP land available to distribute, if the rate of land reform in the sugar industry is to be maintained or increased, more land will need to come from white LSG land that enters the property sale market, which will need to be transferred to PDI growers and Inkezo has a large part to play in this. Since Inkezo was only founded in 2004, it has not had much impact on the previous rate of transformation, and once its activities have gathered momentum and the land restitution process is completed, the average increase in PDI ownership could be accelerated and the target reached. In addition to improving the rate of transformation, the failure rate and subsequent exit of PDI growers from the industry needs to be minimised. The SA Sugar Industry will need to clearly identify the causes of failure and assess the options available to ensure the sustainability of new PDI growers that enter the industry.

Land reform is a slow and difficult process. The challenges need to be addressed and the time taken for restitution claims to reach resolution needs to be dramatically reduced. Despite these challenges the Sugar Industry has been moving steadily in the right direction towards meeting the State's land reform target. However, there is still a lot of work to be done to accomplish this and the challenges to the process will need to be continually addressed to ensure that the target is reached.

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LIVESTOCK-BASED LIVELIHOODS: COMMERCIALISING LIVESTOCK PRODUCTION UNDER COMMUNAL LAND USE SYSTEMS

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Abstract

South African agriculture has a dualistic economy: the first economy comprising of large commercial farmers, and the second economy composed of small subsistence and developing farmers. Supporting the second economy is a major need and priority in South Africa. In Limpopo Province, Blouberg Local Municipality has been identified as a nodal area where livestock farmers need to be supported for the production of livestock. The focus is on the development of the livestock production sector, concentrating on communal lands. In this paper, strategies that can be used to transform farmers in communal land use systems from subsistence livestock production into viable systems of production and marketing livestock through formal markets are evaluated using Agricultural Research for Development (ARD), a holistic approach to collective rural innovation and development. The findings of this study indicate that involvement of all stakeholders in formulating development interventions can lead to sustainable development and strengthening of inter-organisational linkages.

Key words: Livelihoods, Communal land-use systems, Livestock, South Africa.

Background

In order to address the injustices of the past in land ownership, the South African government instituted a number of land reform measures, among which is the land tenure reform. Current land policy, administration and legislation are being reviewed to improve tenure security of all South Africans and to accommodate diverse forms of land tenure, including communal tenure. Cousins (2006) and (Sibanda, 2001) critique the land tenure reform for its snail pace in producing real change in the lives of rural people.

Even though communal lands play such an important part in the lives of the rural poor, the communal tenure system contribute to low productivity because of insecurity to tenure and the inability to use land as collateral for bank loans. Management of communal lands is also a mammoth task. In addressing the needs of the rural dwellers, who produce mainly under communal land use, is land reform an appropriate measure or can the agrarian reform better make the much needed change? Cousins (2006) contents that although land reform and agrarian reform are inseparable, agrarian reform is paramount. The agrarian reform is much broader in scope and aims to restructure rural economic areas and socio-political relations, creating 'accumulation from below'. This implies that the rural dwellers do not only have access to land, but inputs, implements, marketing outlets, infrastructure such as transport and communication, support services such as extension, trading and marketing advice (Cousins, 2006).
Conducive agrarian reform conditions can be facilitated amongst others by the area-based land reform, the strategy which the Limpopo department of agriculture (LDA) has adopted. With this approach, infrastructure and support services can be provided to land reform projects more cost-effectively. The approach calls for the contribution of other agencies in the private sector as well as civil society in collective service delivery to compliment government functions.

Like all the provinces of South Africa, Limpopo has two distinct types of agricultural production systems; the large scale commercial system that forms part of the first economy, and the smallholder farming system of the second economy. The smallholder farms are located mainly in the former homeland areas and cover approximately 30% of the provincial surface area. The other 70%, which happens to be prime land is white owned. About 89% of the Limpopo population is classified as rural (STASSA, 2002) and agriculture plays an important role in the livelihoods of the people and in the economic development of the rural areas of the province.

The South African government has put forward as one of its priorities strategic imperatives the support towards the second economy. In Limpopo province, which is dominated by the rural poor, various intervention strategies have been institutionalised to aid smallholder farmers become sustainable and join the mainstream economy. The LDA has adopted a municipal-level service delivery model. This approach entails provision of extension support and infrastructural development to commodity organisations. The department recognised that amongst others, the success of this approach depends on organisation of farmers into commodity organisations for better targeting of government interventions; development of human and physical resources and promotion of sustainable production.
This new mode of operation was piloted in the livestock production sector of Blouberg Local Municipality (BLM) before broad-based application throughout the province.

The Study Area

Blouberg Local Municipality (BLM) falls within the Capricorn District Municipality (CDM) in the Limpopo Province, South Africa. The CDM is classified as semi-arid area, making the area prone to drought. Blouberg receives an annual rainfall ranging between 380 and 550 mm: the rainfall is concentrated mainly during summer (November-January). The CDM is a commercial farming area, but extensive areas are populated by the Pedi tribe that makes use of communal land use systems. Blouberg is characterised by a high unemployment rate of 52.6%, and lowest level of education within CDM. On average, 34.7% of the households have no formal income (Integrated Development Plan, 2005/6). The two villages, Gemarke and Early Dawn were selected for the study.

Problem Identification

BLM has been identified by the LDA as a nodal area where livestock farmers need to be supported for the production of livestock. Livestock numbers in this municipality are considerable, and are complimented by the availability of extensive range land. However, there is difficulty in optimal management of this range land and other natural resources. Furthermore, livestock keepers find it difficult to profitably market their livestock produce. In addition, some of the residents are poor and in need of any opportunity that can build their capacity and enhance their economic development.
This paper looks at the contribution of livestock in the livelihoods of the rural areas of BLM, together with the opportunities for commercializing livestock production in the communal land use system through better management and sustainable use of the agro-ecological and socio-economic resources. The efficiency of the new mode of operation of LDA is also reviewed.

Methodology

A holistic approach to collective rural innovation and development, termed Agricultural Research for Development (ARD), was used in carrying out this research. As ARD is multi-faceted, it provides synergy of various other approaches, making it an ideal approach to create the much needed paradigm shift in South African research and development. Participatory Rural Appraisal (PRA) tools such as

meetings, semi-structured interviews, focus groups discussions and workshops provided a platform for a team of researchers to explore possibilities for increasing production and commercializing livestock under the communal land use system, and to gather different perspectives of the key stakeholders.
Data was collected by interacting with different stakeholders such as farmers, traditional leaders, auctioneers, LDA (extension officers, agricultural economists, animal scientists, and managers), the municipality (CDM and BLM), and representatives of tertiary institutions (Universities of Venda and Limpopo, Tompie Seleka and Madzivhandila colleges of agriculture).
Potential opportunities and associated strategies to enhance the livestock farming-based livelihoods and ultimately commercialization were jointly analysed and prioritised by all key stakeholders.

Discussion

In investigating the possibilities of commercialising livestock under communal lands system and devise strategies that match the livelihoods, it was imperative to examine the need for typology development; the rationale behind livestock keeping; the constraints in livestock keeping; the marketing channels followed and the general challenges faced by these small-holder farmers. In development context, it is imperative to assess if the proposed development strategies are compatible with the livelihood strategies.

Typology

Rural communities are often perceived as harmonious and homogenous, a wrong perception. These communities are composed of different economic groups that have different access to resources. Their preferences, objectives and expectations also vary, leading to different livelihood strategies. This implies that perception and reaction to the problem situation and developmental interventions will differ.
Since it is not possible for the government to address the needs of households individually, and it was viewed important to determine whether the farmers can be grouped into fairly homogenous groups with similar needs. As a result, the livestock owners were classified into suitable target groups that can facilitate future targeting of interventions. A univariate analysis through livestock numbers (ICRA, 2006) was used in constructing a typology for the two study villages to describe clustered types of farmers. A summary of the five tentative clusters is presented in Table 1.

Table 1: A tentative livestock farmer's typology

Farmer target group: Livestock numbers
• Cluster 1: 1-5 LSU • Cluster 2: 6-10 LSU • Cluster 3: 11-15 LSU • Cluster 4: 16-20 LSU • Cluster 5: > 20 LSU LSU: Large Stock Units

The livestock kept in households varies in types and numbers. The number owned can stimulate interest in livestock developmental projects. Table 2 displays the type and the numbers of livestock owned with respect to Gemarke clusters. Only three clusters apply in Gemarke since no farmer owned more than 15 LSU's.

Table 2. Livestock type and numbers amongst clustered farmers in Gemarke

Cluster	Livestock type	Total	Average	Livestock type	Total	Average
1	Cattle	34	1.7	Goats	145	7.3
2	Cattle	47	4.7	Goats	85	8.5
3	Cattle	57	11.4	Goats	42	8.4

The average numbers of livestock in the clusters exactly match the intended range for each cluster. In clusters 1 and 2, the average number of cattle is lesser, compared to the average number of goats; while in cluster 3 the average number of cattle surpasses the goats' average. From these clusters it is clear that the lesser the number of cattle the more the number of goats, indicating a probable negative correlation between the two types of animals. One could also argue that as soon as the number of goats surpasses a certain number, the surplus is converted into the purchase of cattle. As small stock dominates in clusters 1 and 2, it can be concluded that the farmers in these clusters are predominantly small stock keepers while farmers in cluster 3 may be regarded as large stock farmers.

Livestock composition also varies between the different clusters in Early Dawn as shown in Table 3.

Table 3: Livestock type and numbers amongst clustered farmers in Early Dawn

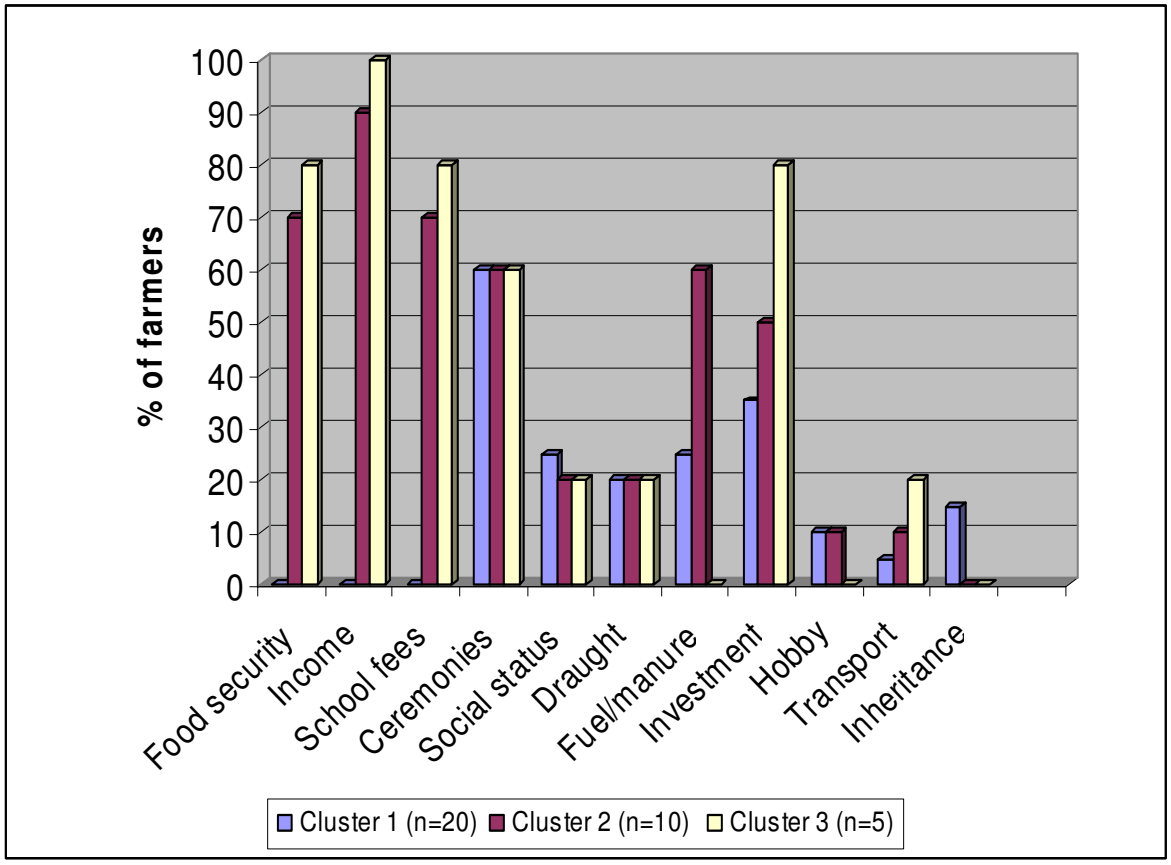
Cluster	Livestock type	Total	Average	Livestock type	Total	Average
1	Cattle	15	1.3	Goats	87	7.3
2	Cattle	59	5.4	Goats	126	11.5
3	Cattle	47	11.5	Goats	17	4.3
4	Cattle	52	17.3	Goats	20	6.7
5	Cattle	171	28.5	Goats	52	8.7

The negative relationship between cattle and goats is also evident in Early Dawn. As in Gemarke, farmers in clusters 1 and 2 can be viewed as small stock keepers due to their higher numbers of goats whereas clusters 3, 4 and 5 are predominantly large stock keepers considering their number of cattle. However, there is potential for small stock farmers to graduate into large stock keeping as the number of small stock increases. It can therefore be concluded that grouping farmers into different target groups may not be beneficial for short-term interventions, but rather all can be regarded as purely livestock keepers.

Reasons for Keeping Livestock

The reasons for keeping livestock serve as a measure of the importance and role that livestock plays in the livelihoods of these people, and to determine whether any commercialisation mindset exists. The reasons for keeping livestock are related to the numbers of livestock kept and vary from farmer to farmer. Thus it is important to understand the farmers' objectives.
The motives for keeping livestock included food security, source of income, social status, draught power, cultural reasons, investment and fuel/manure. The reasons for keeping livestock mentioned by farmers in Gemarke village according to the cluster they belong to are presented in Figure 1.

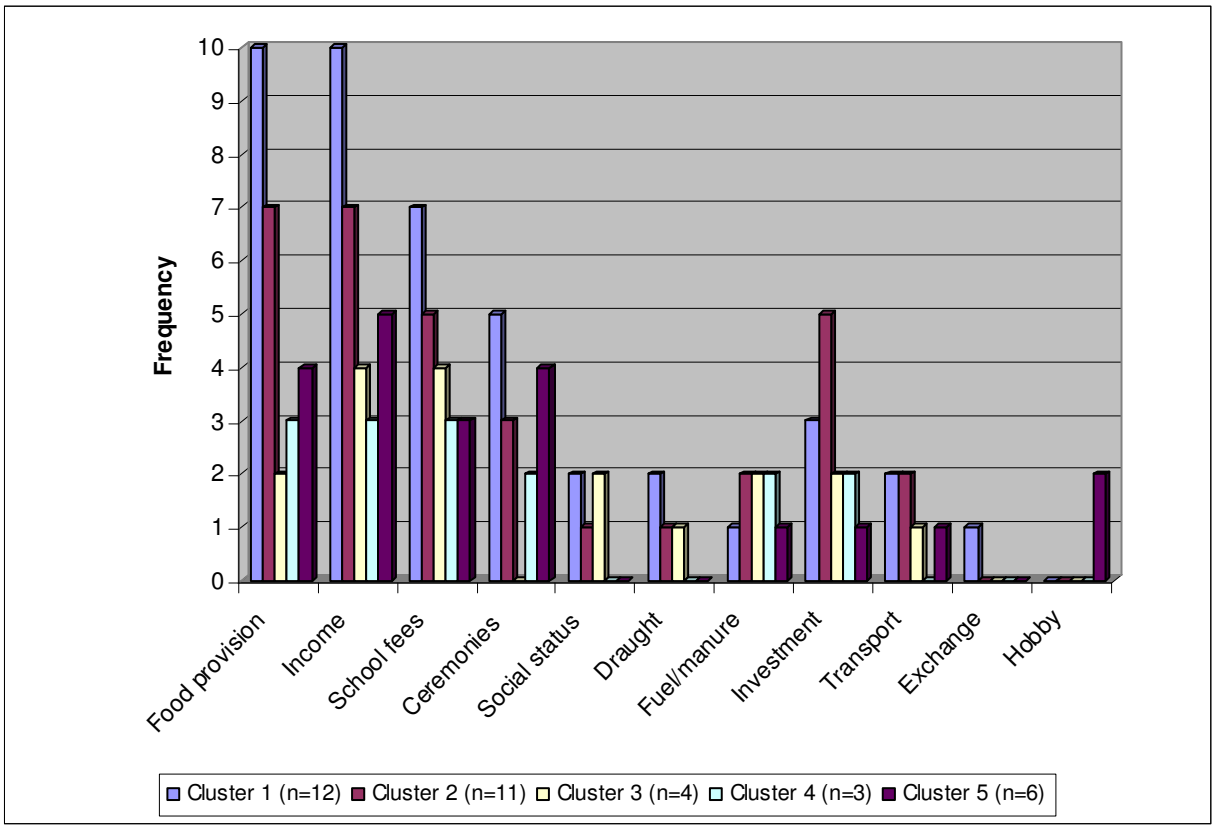
Figure 1: Reasons for keeping livestock as stated by clustered livestock keepers in Gemarke



Cluster 1 encompasses farmers with very few livestock, and this could imply that livestock does not play a very important role in their livelihoods. Ceremonial reasons (religious, funerals and weddings), manure and draught for crop production were most frequently mentioned in cluster 1, even though keeping livestock for investment and social status was mentioned to some limited extent. In the second and third clusters, livestock is kept for income generation, food security, school fees, investment, and manure, in order of frequency of mentioning. This situation may imply that these farmers depend more on livestock for attaining a sustainable livelihood.

The rationale for keeping livestock in Gemarke did not deviate much from Early Dawn as Figure 2 indicates. Livestock keepers in clusters 1, 2 and 4 referred to food security and income as reasons for keeping livestock. Income was the most frequently mentioned reason for keeping livestock in cluster 3. Income was also the most frequently mentioned reason for keeping livestock in cluster 5, followed by food security and ceremonies. Use of livestock for provision of manure (fuel and fertilizer), draught (transport) and social status play a less important role.

Figure 2: Reasons for keeping livestock as stated by clustered livestock keepers in Early Dawn



Keeping livestock for income purposes was mentioned by some clusters, but mainly to meet some social responsibilities such as paying school fees, health care, food requirements, etc. The role of livestock is important but is still mainly related to reaching more subsistence and secured livelihood objectives. Subsistence oriented reasons (food security, school fees, ceremonies, investment) dominate the household decision making process regarding livestock management. This is the same for all tentative clustered target groups. Commercialization considerations do not play a role yet. As livestock keepers in the two villages are still focusing on subsistence objectives, it is important for development intervention by the LDA and other stakeholders to focus on this and build on it as a step towards commercialisation.

Constraints

It is important to recognize the role of smallholder farmers in livestock production and agriculture in general, but even more so to identify those factors that prevent them from being efficient and productive farmers. It is often the lack of crucial productive resources such as land and credit that render the image of smallholder farmers as being marginal and inefficient producers.

In both villages, theft, diseases and drought (resulting in lack of fodder and water) were cited as the major constraints faced by farmers in livestock production. Stock theft causes high economic losses to farmers. Farmers are very much concerned that stock theft causes not only an economic loss to them as farmers, but also a social loss as stock theft can also lead to a lower level of trust among community members.

Livestock farmers consider animal diseases as one of their major constraints. According to the farmers, high mortality caused by tick-borne diseases such as heart water cause significant losses in livestock production. The farmers need access to a number of animal health services in order to keep their herds or flocks healthy. Some critical requirements are access to preventive disease control measures such as

vaccinations and internal and external parasites control; a reliable supply of key veterinary pharmaceuticals; training in the administration of key pharmaceuticals and the follow-up treatments. Drought was also frequently mentioned by farmers as a major threat. Its effects are mainly felt by the livestock keepers through constraints in supply of fodder and water.

Providing various services to the farmers at municipal level by the LDA, targeting farmers as commodity organisations can go along way towards addressing these constraints. It is evident that opportunities to minimize the effect of the main constraints identified require action by the community. Unfortunately, appropriate community structures are weak or non existent. Perhaps the most important constraint to livestock development is the lack of a common vision and implementation strategies among the villagers. To change this situation, a change of mindsets among villagers is required.

Marketing

Communal livestock farmers are numerous and operate at a small scale. Subsistence objectives still dominate their farming systems e.g. food security, ceremonies, investment, income generation or selling during emergencies. This means that the time for selling animals vary from farmer to farmer and is not yet determined by economic related objectives (production and price). As a result, farmers sell their animals when they are in need of immediate cash to speculators, local traders, neighbouring commercial farmers, individuals, depending on the market available at the time of sale. Some marketing channels such as abattoirs require large volumes and higher quality animals. It is obvious that the current situation of smallholder livestock farmers (numerous and small) hinders their ability to effectively market their produce in these channels.

The current status of the smallholder farmers prohibits them to access formal commercial markets. This is mainly due to low quality livestock offered to the markets and inadequate institutional arrangements. As a result, capacity building on market requirements is a necessity. A collective effort amongst the farmers can help them overcome some of the marketing obstacles, and facilitate government intervention. In order to market together, farmers would need to have a common vision and work towards a common goal. Careful selection of a niche market can contribute to an effective marketing strategy and an opportunity for smallholder farmers to commercialise.

Challenges And The Way Forward

Overall, the main challenge facing the commercialization of the smallholder sector is the level of preparedness towards this endeavour. Farmers need to first fulfil their subsistence objectives before putting commercialization as a priority. On the other hand, LDA views the main challenge facing the commercialisation of livestock in communal grazing areas as organisation of farmers. This is true as a paradigm shift is required to change farmers from operating as individuals to functioning as groups. This is because social organizations for the smallholder livestock sector are necessary for effective establishment of markets.

In rural areas, collective marketing of livestock in communal land use system can be achieved through formation of farmer groups, cooperatives or organizations, which can assist farmers to negotiate price for their produce. As an association, farmers can make collective decisions on how many animals could be sold per month/year and develop strategies to deal with specific targeted markets. There are a number of benefits associated with collective marketing. Transport costs can be reduced as costs will be shared among all farmers. Farmers can secure specific markets through contracts, and with joint selling, constant supply can be ensured. Other farmers from neighboring villages can be contracted to sell together to meet market demands. Collective marketing also increases the bargaining power as compared to selling individually; it can also encourage farmers to take better care of their natural resources, which may

improve the condition of the grazing areas. With active organisations, the government will be better able to help farmers in collective marketing of their produce and in providing other extension services.
Breaking the 'dependency syndrome' is another challenge to be faced by the smallholder sector, and it is essential that mind-sets of these farmers are changed in order to be able to be independent from government and take initiatives on their own. However, the change of mind-sets takes time as it is related to values, norms and practices in relation to livestock production. If these are not adequately addressed, they can inflict negatively on the livestock commercialization efforts. Any livestock development effort should therefore start with raising community awareness and essential development issues, and it should be realized that this is not a short term process.

The government through its extension services can further play a leading role in addressing some other challenges such as training farmers on livestock marketing; exposing smallholder farmers to already established farmers; capacitating farmers with livestock farming skills; helping farmers recognize potential markets and institutions that provide capital; providing necessary information needed for agricultural production and encouraging smallholder farmers to target local markets. These can be effectively done through commodity organizations.

Currently the older generation is dominating the smallholder livestock sector. Working with this section of the population poses its own challenges. It may be necessary to capacitate the younger generation on issues related to commercialization. If the necessary skills are only in possession of the older generation, this may jeopardize the progress of the livestock commercialization process. There is need to encourage the youth to be more interested in livestock farming activities.

Limited extension services and lack of infrastructure such as sales pens and accessible roads were also identified as challenges to the commercialization of small-holder livestock production. The government can also consider establishment of infrastructure such as sales pens, better roads and subsidize farmers with transport. However, farmers should take the leading role in the planning, implementation and monitoring of such development plans and set rules and regulations for the management of the structures. This will ensure ownership and accountability.

The farmers need to put relevant committees in place to monitor and guard the structures against vandalism. These committees should also take responsibility to fix broken fences and other related infrastructure. This is in line with the requirements of farmers as the grazing area management sub-committee for management of feed resources, water, veld fires was prioritized as the most important sub-committee. Other prioritised sub-committees include the livestock management sub-committee concentrating on animal health and control of livestock theft, and the marketing sub-committee. However, for these committees to function properly, the farmers need to be capacitated on the operation of social organizations and the dynamics associated with them.

Conclusion

It therefore suffices to say efforts of the LDA should put emphasis on community development organizational issues first before infrastructural development and transfer of technologies are considered. However, this may also require a change in the mindsets of the managers and staff of the LDA and local municipalities, who are often under the political pressure to show immediate visual impact.

The promotion of local organizations can contribute to making marginalized groups active participants in their own development. The organizations identified during the priority setting workshop can contribute to management of the grazing area, the infrastructure therein, the livestock and marketing, ensuring that the objective of commercialisation is ultimately realised.

With this process that includes all the relevant stakeholders in identifying problems and devising strategies to solve them, development and sustainability can result. As the saying of the Pedi tribe goes "Greater things can be achieved by a collective effort".

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SUSTAINABLE FARMER SETTLEMENT IN SOUTH AFRICA

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Abstract

Land reform is a burning issue in most developing countries; The South African government also embarked on the programme of land reform in 1994. This programme is aimed at redressing the imbalance in land ownership and bringing previously disadvantaged individuals to participate in the mainstream economy. However, current studies indicate that little has been achieved since the inception of the programme. Most of the set objectives for the programme are yet to be realised, indicating that South Africa requires a paradigm shift on its policies regarding land reform to make a meaningful contribution to equitable land redistribution and realisation of sustainable production. A review on the land reform programme that focuses not only on establishing post-settlement support structures, but also prior planning on pre-settlement, to encourage entrepreneurship amongst the programme beneficiaries, is paramount. This paper analyses the current settlement programme and provides recommendations for successful and sustainable farmer settlement in South Africa.

Keywords: land reform, paradigm shift, land redistribution, land beneficiaries

Introduction

As the process of land transfer progresses, challenges encountered by the newly settled farmers are beginning to appear, as most projects around the country are unproductive and uneconomical. This has brought questions on the impact of the Land Reform programme to the lives of beneficiaries who were expected to benefit from it. As a point of departure, a question may be asked on the objective of the South African government: Is it to settle as many beneficiaries as possible, despite current signs and observation that the existing settlement system is failing?

South African Land Reform

The South African government initiated the land reform programme in 1994. The reform programme constitutes three components that govern the transfer of land to previously disadvantaged individuals, namely land restitution, land tenure reform and land redistribution, with land redistribution being the core programme (Lyne & Daroch, 2002). It is expected that the land redistribution programme will transfer 30% of South Africa's agricultural land to previously disadvantaged individuals by 2015. The programme

was established to alleviate poverty and allow previously disadvantaged individuals to take part in the economic opportunities available in the country through agricultural development (Vink & Van Rooyen, 1996). The programme entails a cash grant offering to households who wishes to purchase commercial farmland from white owners on a "willing buyer, willing seller" basis. During the period 1995 to 2000 land restitution and redistribution together transferred one million hectares of land, or less than 1,2% of the available area, to beneficiaries. Most of these transfers were directed to resettlement schemes on low quality land with communal tenure arrangements in order to reach as many beneficiaries as possible, quickly and at reserved cost (Lyne & Daroch, 2002). This is a very low number, taking into consideration the number of hectares that must still be transferred. Most of these first transfers were done through the Settlement/Land Acquisition Grant (SLAG).

Settlement Land Acquisition Grant (Slag)

The initial approach adopted by the Department of Land Affairs for land reform was the (SLAG) – a system where cash grants of R16 000,00 per household were allocated to previously disadvantaged individuals for farm land purchases. The SLAG programme failed mainly because it was practically impossible for 500 households to be full-time farmers on one farm, as they had to pull funds together in order to be able to purchase unproductive land at high prices (Coetzee & Jooste, 2005) and because it lacked a support package, i.e. infrastructure development funds, credit access and markets (Jacobs, Lahiff & Hal, 2003). The SLAG programme was re-evaluated and in 2001 the Land Redistribution for Agricultural Development (LRAD) was introduced.

Land Redistribution For Agricultural Development (Lrad)

The Land Reform for Agricultural Development (LRAD) programme is expected to enhance "commercial" agricultural production for the market rather than subsistence production (Maura, Shackleton & Ainslie, 2003). It differs from SLAG in that beneficiaries do not have to be poor to qualify for a minimum grant of R20 000, and beneficiaries who have more savings and who can raise bigger loans to finance their farms, also qualify for larger grants. Beneficiaries should add equity and debt capital totalling at least R400 000 to qualify for a maximum grant of R100 000. The approach symbolises a different move in the South African government's land redistribution policy, which takes a different path from poverty alleviation and group settlement, but supports settling prospective commercial farmers on their own farms. In its first year, LRAD redistributed approximately one million hectares of farmland in South Africa (Lyne & Darroch, 2004). The common factor between the SLAG and LRAD is that they are "willing buyer-willing seller" driven.

The "willing buyer-willing seller" strategy has for some time now been under scrutiny as it has achieved minimum success and it was one of the core issues addressed in the 2005 Land Summit held at Johannesburg Expo Centre. One of the points raised was that though land becomes available in the marketing on a "willing buyer-willing seller" basis, the land in question in most instances does not correspond with government developmental needs. What is implied by this statement is that most of the land that is available in the market, in most cases does not fit the criteria or the needs of government in terms of location and the type of farming operations that may take place on the farm (Report on the Land Summit, 2005).

Proactive Land Acquisition Strategy

After the 2005 Land Summit where the whole land reform programme was assessed in terms of its phase and achievements, it was concluded that the "willing buyer-willing seller" approach is delaying the process, thus it was proposed that a proactive strategy should be considered. Therefore, the proactive land acquisition strategy was formed. It is an intervention strategy on a trail basis to accelerate the land redistribution process. The approach deals with two possible alternatives: a needs-based approach and a supply-led approach. The focus is on the government as a lead driver in land redistribution, rather than the current beneficiary-driven redistribution. This means that the government will proactively purchase land

and match this with the demand or need for land in a specific area. The possible advantages identified for the programme are highlighted as follows:

- Promote redistribution in areas where the land market has failed in relation to demand-led redistribution.
- Facilitate planning of commercial redistribution projects where subdivision is necessary and desirable.
- Promote the acquisition of going concerns.
- Ensure better quality of land for redistribution.

Objectives/Purpose

The objectives of this paper are as follows:

- To attend to farmer settlement in South Africa as it is an essential part of the development programme, by addressing a broader development programme of the South African government through agricultural development.
- To investigate the current state on farmer settlement.
- Provide recommendations that can contribute increasing the success rate.

Problem Investigated

The question may be asked on the objective of the South African Agriculture or Land Reform Programme: Is it to alleviate poverty, economic development or transfer 30% of land to historically disadvantaged individuals by 2015? The problem to be investigated is the current farmer settlement approach in South Africa, to evaluate its shortcomings, such as a lack of collaboration and insufficient support structures to empower resource poor, technically inefficient developing farmers. This will be done through reviewing and discussing the secondary data.

Discussions

Analysis Of Farmer Settlement Programme For The Past 10 Years In South Africa

According to Kepe and Cousin (2002) and Randela (2005), Land reform and LRAD have brought little impact to the lives of most rural communities who were expected to benefit from it, since its initiation in 2001. They went further to highlight that the poverty levels of the land reform beneficiaries remained high as beneficiaries have expressed much dissatisfaction about the programme, and most of the redistributed land remained underutilised, because of a lack of basic agricultural resources and operating capital.

According to Jordaan and Jooste (2005), well-organised modern management principles brought about by liberalisation in the agricultural global economic environment, have created a situation in which mistakes from project beneficiaries are not allowed, as they will translate in financial losses which the farmers cannot afford. This has thus brought questions on whether the LRAD programme's objectives of poverty alleviation and economic growth can be met as the established projects have to compete within the competitive and changing agricultural global economy. To date many of the settled farmer's agricultural projects have yet to reveal signs of economic potential. The farmers fail to attain sustainable production parameters which are required for sustainable success. Jacob (2003) has revealed that many aspects have led to the failure of the settlement programme, for instance the lack of sustainable support structures, lack of training and finances (operational capital), Improper selection of beneficiaries, lack of access to competitive markets, failure to develop practical and feasible business plans and, lastly, lack of collaboration between the two departments involved (Agriculture and Land Affairs).

Recommendations

Pre-Settlement

The success of the settlement programme requires that all applicable factors be re-evaluated, and this include the following: improved institutional collaboration, how land is acquired, and selection criteria of beneficiaries, compilation of farm plans and the in-corporation of support structures.

Improved Institutional Collaboration

The execution of the activities on beneficiary level has to be improved. The current structure of DLA is decentralised to cater for more intensive service delivery to rural communities. Other findings by Jacobs (2003), Coetzee and Jooste (2005) suggested that the primary responsibility for implementing the land reform programme should be scaled down to district level, because local implementation will ensure that local demands are dealt with effectively, that land reform is aligned with local development goals as expressed in the Integrated Development Plans (IDP) of each municipality, and beneficiaries can receive adequate training and follow-up support. This will ensure consistent support during and after land transfer. To achieve this, the following adjustments are proposed by Coetzee and Jooste (2005): At a provincial level the PLRO, in collaboration with PDA and other departments, if necessary, can oversee implementation of the broader policy and post-settlement support services as identified in each district. The DLA and (Dapartment of Agriculture) DoA should collaborate more effectively to address the two stages of settlement: pre- and post settlement.

Selection of Beneficiaries

Optimum, as opposed to maximum, beneficiary participation in the process of buying land is imperative. Van Rooyen and Njobe (1996) said that it should be recognised that the Land Redistribution Programme (LRP) would not make an agricultural producer out of every beneficiary, but the programme should create a viable rural economy within which agriculture and the related links can develop. Beneficiaries should be identified on a district level. A strong emphasis should be placed on real poor communal farmers who have the desire to increase their income from farming. Individuals who are more interested in security of tenure than agriculture, should be identified and provided for under the local government and housing programmes, with support from the commonage development programme for their subsistence farming activities. Thus, the real need for land acquisition should be clearly stated (Van Rooyen & Njobe, 1996). The following criteria was observed from international experience and may be the starting point for beneficiary selection: age, education; supply of family labour; farming experience and skills; capital assets; non-farming skills; poverty status; marital status; health status; no prior criminal record and nationality. According to Coetzee and Jooste (2005), for better beneficiary selection the following points can be implemented:

Optimal Farm Planning

Coetzee and Jooste (2005), as well as Jacobs (2003), found that a lack of viable and economically feasible plans is a major constraint to settlement of land reform beneficiaries. In most instances the business plans are compiled for administrative purposes rather than as operational plans for the farming business. Once the profiles and needs assessment of potential beneficiaries have been matched with potentially suitable land, proper feasibility studies (business plans) must be conducted well in advance of the project approval. Careful planning will ensure that all stakeholders have a clear understanding of the economic potential of farms, the means of production and expected returns. Existing data based on ecological suitability and most suitable farming practices must be identified, since it cannot be assumed that the previous owner of the land adopted the best practices. This information should be collated in such a

manner that it provides for household food security, in addition to increasing income from the sale of surplus production on the farm.
The economic and financial potential of the farm should reflect optimal sustainable use of natural resources. The plan should take into consideration the initial tacit knowledge and competencies of the new land owners. The cash flow resulting from farming activities should account for this, i.e. compile pessimistic rather than optimistic cash-flow projections.
It is clear that the farm planning process requires assistance from specialists in the field of project planning. It is essential that consultants who have proven track records of providing this type of assistance are used. The involvement of the beneficiaries, the local DLA planner and PDA (Provincial Department of Agriculture) extension officer is vitally important in this phase.

Sustainable Support Programmes (Post-Settlement)

Extension services

Land reform farming projects face high risks when they begin. Where agricultural extension support is available, the support provided becomes inadequate because the resources of the (PDA) are stretched from having to serve a range of different farm types. Extension workers provide a critical link between farming projects and the government agencies responsible for providing agricultural development support after land transfer (Jacobs, 2003). The allocation of a sufficient number of extension officers with the necessary capacity to provide routine support to LRAD projects is critical for later success. These extension officers must be equipped with basic knowledge of farming practices pertaining to the natural resource use in the area for which they are responsible. These officers are the most important link between the farmers and other institutions and service providers. Experts on farming practice should, in turn, be available to provide support to extension officers on an *ad hoc* basis, as determined by problems identified in the field.

Financiers

Loans, and an effective agricultural development programme, require adequate funding. In cases requiring external financing, i.e. Land Bank mortgage loans, provision must be made for repayment of the loans. Inadequate access to operating or running capital generally causes LRAD projects to under-perform; Business plans should clearly indicate, preferably with the consent of predetermined cooperatives or commercial banks, the availability and use of production capital. To date, however, grant funding for agricultural support post-transfer has not been forthcoming, and land reform beneficiary farmers find it difficult to access credit. In some cases credit is available but the repayment ability is the problem. This is due to the fact that the reproduction levels of direct productive assets are not on standard. Land Reform and LRAD grants may be granted purely for investment in agricultural production input funding, but it is unclear from current national-level monitoring and evaluation data what percentage of the grants has been for this purpose. Sustainable production and income generation depend on access to finance for production start-up inputs like seed and fertiliser, and for fixed capital improvements. According to Jacobs (2003) few land reform beneficiaries had access to financial services because communities, or their legal entities, seldom met the conditions set by financial institutions, such as security or collateral that is required.

Access to markets

Any proposed agricultural enterprise should be supported by sufficient evidence of a reliable market outlet for the output produced, as well as established input suppliers that are within reasonable reach of the project and who are willing to support the project (Mokoena & Makhura, 2003). These markets can either be formal or informal local markets, agreements with retail chains, or agreements with commodity associations or processing plants. In some provinces it is part of the brief of extension officers to

disseminate information about markets (prices, crops, trends and localities). Assistance for the marketing needs of small-scale emerging farmers is also being provided by the National Department of Agriculture Broadening Access to Agriculture Trust (Coetzee & Jooste, 2005). A large number of land reform projects combine subsistence-level production with sales to local markets. These local markets include marketing through cooperatives, local markets, municipal markets, hawkers and direct sales to communities. There are also food-security projects where production is entirely for own consumption. Many officials from the (PDA) argue that it is not part of their mandate to assist communities to obtain access to markets or to arrange marketing contracts for projects (Mokoena & Makhura, 2003).

Training

Farmer training is critical for the viability and sustainability of agricultural projects. Although training needs are identified and stipulated in business plans, actual training only starts after transfer, rather than at the time of preliminary project approval by the District Allocating Committee (DAC). Three methods to facilitate the skills transfer to land reform beneficiaries are training through agricultural colleges, mentorship and management programmes. Modules should be tailored to farming needs of the beneficiaries and cater for their language preferences. Provincial departments of agriculture are to develop strategic partnerships with the ARC and the farmer's organisation AgriSA to assist with such training. The NDA must allocate the necessary funds from its Farmer Settlement and Support budget to provinces to implement the farmers training programmes.

Conclusion

Successful land reform will require collaboration between the (DoA), (DLA) and other relevant stakeholders, and management within these institutions, should be well-organised. These will assist in addressing the land reform in a broader perspective, i.e. the pre- and the post-settlement stages of farmer settlement will be addressed in a holistic approach by the two Departments involved. The support programme that provides finances, markets and other relevant programmes should be provided if the land reform is to reach success. The beneficiary selection procedure should be handled by the district committee, but more emphasis should be placed on the poor people with communal land but that have proved to have the commitment and the edge to be involved in agriculture. The pre-settlement stage of settlement should involve correct selection criteria of project beneficiaries that have entrepreneurship skills and interests. The compiled business plans should not only be developed for administrative purposes, but should also indicate an operational plan of the business, and the post-settlement should focus on the necessary support structures such as credit, markets and extension services for providing technical and agricultural management skills. It is paramount that the Land Reform Programme should be successful because it is an essential part of government developmental programmes and it can also contribute to the country's self-sufficiency on agricultural products.

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STRATEGIC ALLIANCES COME TOGETHER TO ACHIEVE COMMON GOALS IN A REGIONAL CLUSTER DEVELOPMENT PROJECT

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Abstract

A growing number of farms in rural Canada are looking to agri-tourism as a way to diversify their revenue sources and enhance competitiveness. The Agri-tourism Cluster Development project was piloted in 2003 in the province of Alberta, Canada. The project was in response to marketing constraints of individual farm businesses and a market research study that revealed a gap between high consumer interest in engaging in agri-tourism and an apparent low awareness of the opportunities available. The result was a cluster development approach that would assist regional groups to cooperatively raise the profile of agri-tourism offerings while increasing profit at individual farm gates and enhancing viability in rural communities. The project took a multi-faceted approach and included the use of nationally developed resources on agri-tourism from the Canadian Farm Business Management Council (www.farmcentre.com). Following the pilot stage lessons learned were documented, a process defined and the project expanded to what are now nine regional clusters.

Keywords: cluster, agri-tourism, viable, alliance, network, rural economy

Purpose

Agri-tourism is a marriage between two major industries. It is a collection of agriculture-based attractions, events and services that include experiences like farm visits and tours, farmers' market, agriculture festivals and fairs, country vacation farms, guest ranches and market gardens.
Agri-tourism can help to bridge the gap between urban and rural populations. It is also one opportunity for farm families to diversify revenue sources for their operation. It provides new market opportunities and adds value to what they are already producing. In some cases the addition of an agri-tourism venture has been known to assist in succession planning, encouraging the younger generation to stay on the farm and add enough revenue to support more than one generation. Viable farms contribute to viable rural economies.
In the province of Alberta, in Western Canada, agri-tourism is considered to be an emerging, but steadily growing industry. According to a 2005 study, the agri-tourism industry in Alberta has the potential to almost double by 2010, (http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/apa547/$FILE/alternative_agriculture_markets.pdf).

The concept of an agri-tourism cluster development project in Alberta was developed in response to a number of factors, not the least of which was the limited marketing budgets and expertise of individual agri-tourism operators.

Also, an opportunity analysis was conducted by Dr. Ed Mahoney, rural tourism expert from Michigan State University, U.S.A. Dr. Mahoney determined Alberta had the “fabric but not the quilt”. There was a

need to tie together individual agri-tourism operations through partnerships, packages and cross promotions.

Concurrently, market research studies conducted by Travel Alberta (www.industry.travelalberta.com), Alberta's provincial destination marketing organization revealed a gap between high consumer interest to engage in agri-tourism and an apparent low awareness of the opportunities available.

The last factor was one team member's interest and awareness of an internationally recognized economic development process known as "cluster development". A resource called the Cluster Initiative Greenbook was also consulted (this book was initially launched internationally at the Competitiveness Institute Annual Conference in 2003 - http://www.isc.hbs.edu/Greenbook.htm).

As a result of these contributing factors, the Agri-tourism Cluster Development project was piloted in 2003 in three geographic locations in Alberta, through the leadership of provincial government employees on an Ag Tourism Team in the department of Alberta Agriculture and Food (AF).

An agri-tourism cluster was defined as a group of like-minded stakeholders and operators who come together to increase the profile for their operations and geographic area along an ag tourism theme. The objectives of the project focused on:

- Linking dispersed products to increase impact
- Using the theme of agri-tourism to tie assets together
- Accessing new markets
- Increasing their profile, awareness and word-of-mouth marketing for both individual operators and their rural community, and
- Ultimately increasing profit at the farm gate

Following the pilot stage lessons learned were documented, a process defined and the project expanded to what are now nine regional clusters.

Methods

The locations for the pilot project were chosen on the basis of the strength of the local leadership, public and private sector interest, existing critical mass of market-ready agri-tourism operators and proximity to a large urban audience or tourism market.

It quickly became apparent that each of the initial three cluster areas were at different stages of development and had different needs and target markets. However common steps were taken with each group and as a result of the pilot project a flexible *4-step process* was developed to be used for subsequent clusters.

Outside of AF's staff time and travel, no additional funding was sought for the pilot stage. However, the following years have seen access to minimal funds to assist clusters with administration details such as inventory enhancement and coordination support. Cluster groups were asked to submit an application for funding that demonstrated multi-operator and stakeholder support and commitment to objectives for increasing exposure and awareness. A final report was required, as well as contribution to a provincial newsletter regarding lessons learned. Funds available to clusters ranged from $2000 to $9000 CDN.

Thanks goes out to the Alberta Agriculture and Food Council (http://www.agfoodcouncil.com/) for funding support through the former Canadian Adaptation and Rural Development Fund (CARD) fund, as

well as the Agriculture Policy Framework - Renewal Chapter for their support through the (http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/bmi9351).
Most cluster groups have been able to leverage the nominal funding by accessing programs such as Travel Alberta's Tourism Destination Region marketing funds (http://www.industry.travelalberta.com/Marketing/Regions/) for collaborative initiatives.
The following *4-step process* includes logistical details from the pilot phase, as well as keys to success for each step:

1. Rally the troops – Phase 1, Stakeholders
    - Meet with local stakeholders and discuss opportunities and challenges facing agri-tourism in the area.
    - Potential stakeholders may include agriculture, tourism and economic development staff, as well as key operators. Look to all three levels of government in local communities – federal, provincial and municipal.
    - Allow time for networking and building rapport. Gauge support and interest in working together.
    - Discuss and agree on the basic premise of agri-tourism cluster development and the common, overarching goal, "*there is profit to be made through partnerships"*, and *"agri-tourism operators can access new markets, build profile and increase their appeal/draw by working together"*.
    - Inventory agri-tourism operators for the area and a list of other potential stakeholders.
    - Determine next steps, i.e. operator meeting date, venue for the meeting and offers from stakeholders to sponsor a meal, send invitations and take RSVPs.
    - Stakeholder support is a significant key to success. They may need probing to realize that they provide things like:
        - Knowledge of the local area, as well as the agriculture and tourism sectors.
        - Knowledge and access to local resources (ie. mapping, graphics, public relations, access to networks, places to meet, administrative support, etc).
        - The ability to help bring people together and keep a project progressing.
        - Funding.
        - Programs for business planning, marketing, etc.
    - Allow time for them to communicate about their organization and what they bring to the table, as well as to build rapport and excitement.

1. Rally the troops – Phase II, Operators
    - Hold an operator meeting in conjunction with local stakeholders.
    - Discuss and agree on the basic premise of agri-tourism cluster development and the common, overarching goal (see Phase 1).
    - Present the definition of agri-tourism; demonstrate why clustering, partnerships, cross promotion and word-of-mouth are important for agri-tourism industry development.
    - Allow groups to network, get to know each other and build rapport.
    - Discuss basic parameters involved in working together.
    - Develop clear action steps.
    - Suggest operator invitees (focus on market-ready agri-tourism operators):
        - Start with an existing inventory if available, such as Alberta's Agri-tourism Directory, which can be found at: http://www1.agric.gov.ab.ca/general/agritour.nsf. Use stakeholders and key operators to flesh out the list (i.e. garden center/greenhouses, market gardens, food and agri-processors, other potential farms and ranches)
        - Ag Societies
        - Farmers' Markets

    - Other ag-based historic sites, museums, and event organizers (e.g. country fairs, rodeos, etc.)
    - 4-H clubs
    - Ag-inspired retailers and artisans
- Take time to think about the process for this meeting. Determine the desired outcomes and ensure that the meeting is structured to achieve these outcomes (i.e. provide opportunities for networking, structured small group discussion, etc). This meeting will lay the foundation for future initiatives.
- Attempt to build excitement and reinforce confidence by showing support.

2. Seed with some ideas
- There are many sources for ideas. Look to other jurisdictions to see what they have done.
- In an attempt to get quick wins in the pilot stage, agri-tourism cluster success stories from other regions were researched and shared with the participants through handouts, websites, and brochure examples. A comprehensive guide of ideas and several links can be found on www.agtourism.ca. The presentation should be on market-focused projects that result in increased word-of-mouth. A guest speaker from another cluster may be considered as well.
- Ideas could be presented in the following groupings:
    - Driving tour routes – events involving self-guided travel with an associated map and guide.
    - FAM (familiarization) tours – a concept used to physically show invited participants what a group of operators has to offer.
    - Agri-food events – a method of showcasing locally available food products and their producers.
    - Operator showcase at existing events – a way to bring the product to the market through a tradeshow and/or demonstration type approach.
    - Driving guides – a seasonal print piece for traveling consumers to learn about and locate local agri-tourism operators.
    - Packaged getaways – a combination of travel experiences and services coordinated and sold as a package to the traveling consumer.
    - Cross promotions – a process whereby operators promote each other for mutual benefit.

3. Pick something and run with it
- There are several projects to choose from. Encourage the group to first decide what market they want to influence. Then pick an appropriate project that is both achievable and a "quick win", one that will build cluster momentum, trust and rapport among players and confidence in their abilities. Emphasize the need to strive for "progress, not perfection".
- Spend time discussing the objectives (e.g. raise profile and awareness of operators, educate about local agriculture, increase cross-promotion, raise money for the group, provide sales opportunity for operators, etc.) They may want to achieve a combination of objectives – ensure that there are strategies in place to achieve each one of them. This is also a good time to remember the common, overarching goal about building profile and awareness.
- To keep the meeting participants engaged, encourage them to pick projects they could get started on right away.
- Urge the groups to set up meeting dates before leaving, list who else needs to be involved, determine key project champions and get many helpers involved.
- Discourage groups from "reinventing the wheel" – have them contact those who have already tried things and learn from their experience.
- Encourage stakeholders to offer venues for meetings, key contacts and other support.
- Recommend further sponsorship and funding where possible.
- Promote and cross-promote the project.

- Take time to continue to build relationships and trust along the way (i.e. use work-bees for specific activities, take time to celebrate).

4. Evaluate and follow-up
    - To help with future planning it is very important to track the process and project results.
    - Use the original project objectives to determine what things will be tracked (e.g. sales, visitation numbers, demographics of participants, web hits, etc).
    - Keep a record of all process information, applications, media coverage, etc. The information collected can help in planning future initiatives, as well as recruiting new operators or potential sponsors.
    - Consider using a prize-draw or some other means to establish a database of the people who came.
    - Following project completion take time to debrief, discuss lessons learned and talk about next steps.
    - Make the time for recognition, celebration and continued opportunities to network.

Principal Results

There were many success stories that resulted from the pilot phase:

- Familiarization (FAM) tours:
    - Operators toured key agri-tourism operations in Strathcona County to enhance cross-promotion of each others operations.
    - Claresholm Chamber of Commerce and local urban businesses toured seven guest ranch operations in the Porcupine Hills to improve knowledge of agri-tourism in their rural surroundings and increase word of mouth promotion.
- Supplier Showcase:
    - 17 regional agri-tourism operators developed display booths for Little New York Daze event in Longview to build word of mouth promotion among community residents and visitors.
- Weekend Driving Tour Events:
    - Country Soul Stroll in Sturgeon County. Twenty Five operators sold the opportunity to experience the benefits of traveling through the country and discovering the importance of agriculture in their own backyard.
    - Fur and Feathers Farm Tour in Strathcona County. Ten alternative livestock operators and rural foodservice suppliers enhanced exposure to farm products, and offered education about the value of agriculture.
- Special Agri-food Event:
    - Harvest Festival of Foods in Strathcona County. Regional cuisine producers collaborated with top Edmonton chef to showcase locally grown and processed agri-food products.

For all clusters, a level of advertising and promotion was attained through collaboration that individual operators could never achieve on their own, culminating in increased exposure, awareness and access to new markets. As well, the pooling of marketing dollars made it possible to access marketing funds aimed at consortia-based projects. New marketing tools were developed such as maps, brochures and websites that have aided in cross-promotion and a lasting presence in the marketplace. Furthermore, operators with retail outlets also benefited from event-day sales and resulting repeat business.

Today, some of the initial projects continue to evolve, some have stopped and many new ones have started. The clusters continue to progress and change at varying rates all depending upon the engagement and leadership of local operators and stakeholders, their experience and readiness to work together and a collective vision for the project(s).

Continuing projects include:

- Country Soul Stroll - www.countrysoulstroll.ca
- Visit the Country Guide and Edmonton Countryside Spring Drive - www.visitthecountry.ca
- Country Christmas - www.countrychristmas.ca
- Red Deer's Country Drive - www.countrydrive.ca
- Lethbridge's Fun Farm Tour - www.funfarmtour.com

As a result of the ongoing cluster development project a number of outgrowths have transpired, including educational programming, resource development and communication initiatives:

Education:

- A need was identified by all clusters to grow the number of market-ready agri-tourism operators. As a result a workshop called *"Opening Your Gates to Ag Tourism"* has been held in each cluster area. The focus of these workshops was the business development aspects of starting an agri-tourism venture. It should be noted that a key resource used in the workshop was developed by the Canadian Farm Business Management Council called Cultivating Agri-tourism: Tools and Techniques for Business Success (www.farmcentre.com).
- Even market-ready operators felt a need to improve their site image and presentation. AF led workshops were held with early clusters on *"Getting Your Site Guest-Ready"*. A training DVD was consequently developed to cover similar topics and has been shared with the clusters.
- Conferences aimed at cluster operators and stakeholders were held in two different locations. The *"Harvest the Talent, Grow the Cluster"* conferences focused on the needs identified in an educational survey, encouraged networking among cluster groups and enhanced exposure of cluster success stories and techniques from other jurisdictions.
- Mentorship consultations were held between an advanced operator from the province of Ontario and cluster groups to learn about methods of improving and enhancing marketing techniques.

Resources:

In addition to the *4-step process*, a number of resources were developed to support the development of clusters, including:

- Factsheets called *"Establishing Ag Tourism Routes"* and *"Coordinating Ag Tourism Familiarization Tours"*, as well a 73-page *"Consolidated Guide to Ag Tourism Cluster Projects in North America"*. All of the above, as well as several other resources and weblinks are available on www.agtourism.ca.
- The *"Expecting Company? Preparing Your Site for Ag Tourism"* training DVD is available for sale on the AF website under Publications and More – www.agric.gov.ab.ca.

Communication:

Regular meetings and conference calls continue to be held with key operators and stakeholders in each of the clusters.

- In addition, a *"Cluster Communiqué"* was developed and sent out regularly to the coordinators who were assisting the clusters with inventory enhancement and cluster coordination.
- An *"Ag Tourism Cluster Development Newsletter"* has been done twice yearly since 2005 and sent out to all operators and stakeholders in all of the existing clusters. Back issues are available on www.agtourism.ca. An inventory of all operators and stakeholders throughout the province continues to be maintained for this purpose.
- Lastly, a networking, training and best practices day has been held for the last two years for all of the cluster coordinators.

Major Points of Discussion

The role of government for this project is predominantly as a catalyst. The approach of AF has been to bring parties together, introduce ideas, and link them to networks, resources and funding sources. The

premise of government remaining as third party catalyst is to empower those operators and stakeholders to choose, build and drive their own projects. Sustainability within the clusters will only be achieved when groups are held responsible for the success or failure of a project.

At times it has been difficult to resist providing a specific direction or offering more support then was appropriate, however in the long run it was recognized that the process and subsequent learning was as important as the actual end product. As a result, knowledge, skills, confidence and leadership all grow among clusters and the individual operators that comprise them.

A somewhat unexpected result from the cluster development program is the diverse group of stakeholders coming together. We learned that tourism, agriculture and economic development staff do not cross paths very often, even in smaller rural communities. This diverse support has helped to strengthen cluster groups and has provided a venue for these stakeholders to come together on other issues and initiatives. Our belief is that it also helped to bridge the urban-rural gap in these communities where stakeholders were largely unaware of the depth of the agri-tourism industry and it's potential.

On a few occasions it was the stakeholders who took it upon themselves to nominate clusters for various provincial awards. The Country Soul Stroll, a flagship cluster project, has been the recipient of a Growing Alberta Leadership Award (http://www.growingalberta.com/about/default.asp?id=261) for Innovation, and two municipalities won a joint Municipal Excellence Award (http://www.menet.ab.ca/107.asp) for their contribution in the cluster development process as a leading practice.

A flexible process such as the agri-tourism cluster development initiative does not come without its challenges:

- For example, bringing together different players who are at different levels of development and commitment, and who have different needs, can present a struggle when trying to find common ground. Even when common goals and objectives are set, groups can sometime lose site of these as projects develop and evolve.
- Learning tends to happen on an incremental level and marketing continues to be a learning progression. Marketing strategizing and tracking have presented a significant uphill learning curve, not only for operators, but also for stakeholders as the specific market demands for agri-tourism are still in the process of being realized and understood. In fact, the concept of agri-tourism can still carry a somewhat negative stigma among some conventional or traditional players in both the tourism and agriculture industries, as any emerging sector often does.
- The result of an industry still in its infancy stages is that there are operators who do not even realize they have something to offer in agri-tourism and thereby don't consider themselves a part of the industry.
- With the exception of one cluster group, most have opted to maintain a fairly loose business structure. Although the flexibility can be beneficial for changing players and needs, it can also present a challenge when issues arise or the need for a formal body is required to apply for funding or speak to the groups needs.

Conclusions

AF is excited by the results of the agri-tourism cluster development project and the future potential. We continue to see a role in communication between cluster groups in order to extend new ideas and key learnings from one cluster to the other, as well as encourage cross promotion of the projects. It is hoped that once groups meet critical mass with their regional projects, a promotional plan focusing on the agri-tourism network at a provincial level will emerge.

Support will continue for existing cluster groups. In the voice of one key operator, "Without AF assistance, many projects will suffer death by operator burnout. It is key that the projects gain sufficient momentum to drive themselves, but the first five years is the most tenuous." Indeed, we continue to see leadership grow within the clusters and the learning and development must continue to be nurtured in these early years to ensure sustainability.

Clusters that started with a simple weekend driving tour event have begun to evolve with more year-round, sophisticated and diverse promotions, for example: the addition of a food and/or media event, additional tour weekends, specific offerings for the travel trade industry, and so on. As these projects evolve, groups with specialized offerings and niche markets begin to emerge within clusters. We have seen groups with culinary, garden-inspired and cowboy/ranch themes begin to develop. Cross promotion continues to grow as well. These new initiatives need to be nurtured and supported by the collective alliance as they provide depth to Alberta's agri-tourism offerings.

WHO ARE TODAY'S FARMERS AND WHAT ARE THEIR EDUCATIONAL NEEDS?

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Abstract

Farmers are changing! According to the U.S. Census of Agriculture, almost 78 percent of farms in 2002 had annual sales of less than $50,000 – down significantly from previous years. Farmers have less time available for day-time workshops and are becoming more adept at obtaining information and participating in educational opportunities via the internet and private providers.Extension educators had only anecdotal evidence on the information desired and educational methodologies preferred by farmers. A statistically valid survey was conducted in 2006 of farmers in Arizona, Colorado, and Wyoming. The questionnaire was designed to discover the demographics, preferences for learning methodologies, greatest threats, and information demands of today's farmers.Survey results will aid in the identification of new Extension clientele and their education methodology preferences and perceived risks. Educators will be better able to develop risk management programs demanded by a far broader audience and to more efficiently use scarce resources.

Key Words: rural family, clientele, education, risk management, farming

Introduction

The rural West has experienced dramatic demographic and economic transformations over the past decade. The make-up of farm operators has altered significantly and enterprises are increasingly at greater production, financial, marketing, human, and institutional risks. Therefore, the role of Extension has become rather critical in economic sustainability of farm operations in the West.

Passage of the 1914 Smith-Lever Act launched Extension education in the United States with the stated basic purpose: "to aid the diffusion among the people of the United States useful and practical information on the subjects relating to agriculture and home economics and to encourage the application of the same." In the earlier years of Extension the transfer of knowledge occurred primarily through face-to-face education. While face-to-face education continues to be an effective method, other delivery mechanisms have been used to keep pace with the emerging communication technologies, increased time constraints of both the producers and Extension personnel, and the structural change in the U.S. agricultural sector in general. These changing methods in education delivery include public radio in the 1930's, television in the 1950's and more recently Satellites in the 80's and the internet in the 90's.

The U.S. Census of Agriculture defines a farm as "any place from which $1,000 or more of agricultural products were produced and sold, or normally would have been sold, during the census year." Federal farm program payments are regarded as sales for the purpose of definitional eligibility.

According to the 2002 Census of Agriculture, there were 48,085 farms in Arizona, Colorado, and Wyoming. A total of 22,797 farms across the three states reported harvested cropland, which constituted a total of 6.533 million acres (2.644 million hectares). Farms reporting 1 to 49 acres (0.4 to 19.8 hectares) of harvested cropland totaled 10,204, or 45 percent of farms across the three-state region. As for animal producers, 21,431 farms reported cattle and calves for a total of 4.794 million head of cattle with 23 percent of those farms reporting 1 to 9 head of cattle and 12,228 (57 percent) having fewer than 50 head of cattle (NASS, 2002).

A comparison of census data for 1997 and 2002 shows several demographic shifts in Arizona, Colorado, and Wyoming farm and ranch populations. While the overall number of farms in the three states stayed consistent during that time, there was significant growth in the number of small farms.

Data show that 78 percent of all farms have annual gross sales of less than $50,000. Most farm operators own and live on their own properties and operate them as sole proprietorships. Farms and ranches are increasingly being operated by females, and most farm operators have off-farm employment, many working off-farm 200 or more days per year. The average age of farm operators in Arizona and Wyoming declined from 1997 to 2002, while the average age of farm operators in Colorado increased during the same period.

Clearly, smaller operations constitute a sizable portion of those involved in crop and livestock production across the three states. And while the current census data does not provide details about the type or scale of smaller agricultural enterprises, it seems likely that smaller operators might engage in a wider diversity of animal and crop enterprises than larger operators. Smaller operators also may manage those enterprise activities in a manner unlike commercial operators.
Thus, a better understanding of the make-up of farm operators and their perceived threats is required in order to design effective risk management education. Anecdotal evidence and U.S. Census of Agriculture data support the thesis of a changing profile of traditional farm operators. However, more in depth information is necessary to answer the following questions:

- Who are today's farmers and ranchers?
- What are their preferences for learning?
- What do they perceive as the greatest threats to their operations?
- What information do they believe would be helpful to them as they manage their agricultural enterprises?

In order to expand upon data available from the U.S. Census of Agriculture and to obtain a more current picture of today's small farmers, a statistically valid survey was conducted in 2006 of farmers and ranchers in Arizona, Colorado, and Wyoming by university Extension educators and researchers (the authors) in cooperation with the National Agricultural Statistics Service of the U.S. Department of Agriculture. The survey targeted those farm operations with annual sales of less than $50,000. To ensure a representative sample from each state, the numbers of survey instruments were allocated based on the population of small farm operators in each state. A total of 2,645 surveys were completed for a total response rate of 53.6 percent. Data were collected on small operator's demographics, sources of risks, information sources and preferences, resource management, and income status. Analysis of survey results provide insights to the characteristics of small farmers and ranchers in the states of Arizona, Colorado, and Wyoming.

Preliminary findings indicate that farmers within the targeted population are highly heterogeneous with respect to their social and demographic attributes. A potential new clientele has been identified as those operators who have never received information from Cooperative Extension, those who are at financial or production risk, and those whose farm income accounts for more than 50 percent of household income. However, the survey results also identified a gap between what respondents believe they need in the way of helpful information and educator curriculum.

Farm Location

The average distance between the property and nearest metro area for the sample of small farms is approximately 25 miles (40.23 kilometers), while the median distance is 12 miles (19.3 kilometers). Survey responses indicate that 71 percent of operator households have off-property jobs. The average distance traveled by an individual holding an off-property job is approximately 29 miles (46.7 kilometers), while most travel only 10 miles (16 kilometers). Careful inspection of the data reveals that there are some operators who have off-property jobs but do not travel any distance at all implying that there are some small farms where non-farm income activities are in practice.

Demographics

A great majority of small farm operators have lived many years within their communities and on their farms and ranches. Small farm operators are typically male, older than 54 years of age, and Caucasian. These operators' spouses help manage the business. About one-half of the two primary farm operators have at least a two-year college degree.

The survey found that 77 percent of the first operators (operator 1) are male, and the remaining 23 percent are female. On the other hand, 68 percent of the second primary operator (operator 2) are female. This suggests that if a farm is managed by two operators, it is mostly likely being managed by a couple. It should be noted that most of farms included in the sample are managed by only one operator (operator 1), and this in conjunction with the fact that 77 percent of operator 1 are male, suggest that small scale farming in the West are male-dominated agricultural enterprise.

More than 45 percent of both operators (operator 1 and operator 2) are in the age group 55 years and over. Summary statistics indicate that on average operator 1 have lived for 19 years on their properties. However, there are some operators who have not lived on their properties for any duration. At the same time there are farmers who have lived on their properties for 94 years. Similar inferences can be drawn for operator 2.

Education

In the development and delivery of educational programs, it is important to know the educational attainments of farm operators. Here educational attainment refers to the highest level education obtained by the operators. Approximately 50 percent of the operator 1 reported having at least a two years college degree, while an additional 33 percent have a high school education and one percent claim no formal schooling. A similar picture emerges for operator 2.

On the surface it appears that small farm operators in the West are educated. But a careful inspection of the survey data reveals that facts are not as rosy as they appear to be at a tangential look. In particular, a significant percentage of both operators (42 percent for operator 1 and 42 percent for operator 2) reported either trade school or high school as their highest level of education.

Attitudes

Just as there is no single type of family business, the reasons people are involved in rural family businesses vary. When asked to indicate why they engaged in their particular enterprise, respondents indicated that "working close to nature" was the most frequently stated reason for engaging in their particular enterprise. Survey respondents corroborated the assumption that a prime reason for family businesses is to earn money and support the family income. . Though it was hypothesized that factors such as rural isolation, lifestyle changes, and inheritance would be significant reasons for

owning/operating a rural family business; "limited alternatives", "change in career", and "inherited" were not seen by the respondents as major reasons for engaging in their rural family business.
For many, living and working in a rural family business is more than being in business. Some would say it is almost like a calling. The general impression is that family business owners are totally committed to the family business. The researchers wanted to know if this held true for survey respondents; or would certain developmental or lifestyle conditions lead rural family business operators to leave their business? But, the results of this survey clearly illustrate that respondents overwhelmingly expect to manage their property, "until I can no longer do the work".

When asked about their sources of risk, survey respondents ranked financial risk as the most important source of risk in the agricultural operation. In addition, more respondents ranked financial risk either first or second than any other area of risk. Overall, production risk ranked as the second most important source of risk to financial risk as over 1100 respondents ranked it either first or second. Marketing risk was ranked as their third highest risk, although survey respondents were less definite in this area of risk than any of the sources of risk. Respondents ranked legal risk management the least important. In addition, fewer respondents ranked this area as the most important source of risk in their operation. Next to legal risk, more respondents ranked human risk the least important. More respondents did, however, give human risk a most important ranking than respondents did for marketing or legal risk.

Farmers and ranchers are the original entrepreneurs. From this study, a picture of the operators of rural family enterprises emerges.

- They appear very comfortable in handling uncertainty in the family business environment. Many factors that will help determine the ultimate success are outside of one's control. To be successful, the family business operator must accept (some say relish) uncertainty and be willing to take risks.

- They strongly believe in their ability to create success for their business. A rural family business operator must have confidence in him or herself and their ability to run a successful operation. There may be plenty of people offering help and advice but the final decision is the operator's.

- They consider themselves successful operators. A farmer or rancher in a family business is responsible for achieving his or her business success. The operator must have an attitude that "I will succeed". If this attitude is not present, operators may not be inclined to put forth the effort needed to succeed.

- They have will power. Will power is the ability of an individual to control and direct behavior in accordance with chosen goals and values. It involves determination, resourcefulness, and responsibility for achieving goals. Overall, the respondents to this survey appear to have the attitude that they are achieving the goals they set for themselves and their business.

- They are fairly optimistic about the future of their business. To be successful in family businesses, one needs to be optimistic; have hope and a positive expectation for the future of the business. Though respondents were strongly confident in their own abilities, they were somewhat less optimistic about the future of their business.

- They are mostly confident in their ability to deal with changes taking place in their business environment. It is unusual for all plans and goals to come together as envisioned. Changes in the business environment, market place, interrelations with employees and family members require the business operator to be flexible and persistent.

Smaller operators are engaged in their particular family businesses to support their lifestyles and their families, to utilize their skills and knowledge, and to make money. They perceive financial risk to be their greatest challenge, followed by risks associated with the production of their commodity or product.

Overall, western producers are confident in their abilities to manage their family businesses and to achieve their goals; however, they are somewhat less confident in dealing with changes in the business environment. They appear optimistic about the future of the business, but they are not very comfortable balancing work and family demands. These individuals enjoy what they do and strive for quality in the family business. For the most part, they do not envision themselves doing anything else.

Operational

Operators of smaller acreages constitute a sizable percentage of the total number of operators across the three states in the study area. These rural property owners typically own 40 acres (16.2 hectares) and do not lease additional land. Wells are the most common source of water, but surface water on or bordering such properties is also typical. Less than half of these property owners use some type of irrigation on their pastures. Many of the operators surveyed use agricultural chemicals, but only about 56 percent reported holding chemical applicator licenses.

Beef cattle, hay, and sheep and goats are the primary livestock enterprises on small farms. However, enterprise type for small operations is just as diverse as for larger operations. Just over half the animal producers indicated they have beef cattle, and the average herd size is 39 head. About 20 percent indicated owning horses, regardless of purpose. Approximately one-third of livestock owners raise their own feed, while the other two-thirds purchase their feed within a short distance of their farms.

Respondents also tend to heavily graze their own property. They reported typically grazing pastures 7.5 months a year and leave none or almost none of the forage. Their pastures have a 50/50 chance of being managed with a pasture management system. If they have a grazing management plan, respondents are likely to have a 4-pasture rotation. Very few have public land leases to supplement production from their own land.

The small acreage managers who reported crop production tend to be irrigated crop producers, with a majority of the acres in alfalfa or hay production. The typical alfalfa producer grows about 60 acres, and the typical hay (not pure alfalfa) producer grows about 51 acres. Small operators usually do not participate in government programs such as the Conservation Reserve Program.

Income

Many respondents from small agricultural operations do not see themselves as farm and ranch operators. Of those who understand they are involved in agriculture, a large majority operate as a sole proprietorship. Two-thirds of the operators have less than $10,000 in annual farm sales, and their revenues and expenses are reported on the Schedule F income tax form. For more than 80 percent of the operators surveyed, the income generated on-farm accounts for less than 20 percent of total household income. Paid employees, including family members, are not typical for small operations in Arizona, Colorado, and Wyoming.

Information Sources

Small farmers and ranchers highly value personal or one-on-one interaction as a means of acquiring new information. Peer/support groups or networks are the most preferred mode of one-on-one interaction. Additionally, information is preferred in print format whether it comes from Internet web sites, trade magazines, or Cooperative Extension. Small producers are not likely to belong to commodity groups, to pay consultants, or to seek agriculturally related information from community colleges. The overwhelming preference for print media was followed by two other forms of printed information: newsletters and direct mailings. Email and video/DVD ranked last, aside from the two write-in categories.

Extension plays an important part in a producer's acquisition of knowledge. A large majority of smaller producers reported receiving information from Extension but not participating in an Extension program in the last 12 months. Understandably, given the average age of producers, most small farm families have not had any family members participate in 4-H for at least two years.

Implications for Extension

From the 2002 Census of Agriculture it can be seen that 78 percent of all farms and ranches in Arizona, Colorado, and Wyoming have annual sales less than $50,000. However, many people operating small agricultural operations do not see themselves as farm and ranch operators. Generally, the income generated by these smaller farming and ranching operations accounts for less than 20 percent of total household income for more than 80 percent of the operations.

A great majority of small farm operators have lived many years within their communities and on their farms and ranches. The properties tend to be about 25 miles from the nearest metro area. While some operators have off-farm jobs, they do not commute very far from their homes. Small farm operators are typically male and older than 54 years of age. Survey data suggests that such farm and ranch operators consider their spouses to help manage the business. About one half of the two primary operators of the farm have at least a two year college degree.

They are engaged in their particular family business to support their lifestyle and their family; to utilize their skill and knowledge; and to make money. With that, they believe that financial risk is their greatest challenge followed by risks associated with the production of their commodity/product. Overall, they are confident of their ability to manage their family business and achieve their goals; though somewhat less confident to deal with changes in the business environment. They appear optimistic about their ability and the future of the business. However, they appear less comfortable in balancing work and family demands. They enjoy what they do and strive for quality in the family business. For the most part, they do not envision themselves doing anything else.

Small farmers and ranchers highly value personal or one-on-one connections as a means of acquiring new information. Peer (support) groups or networks are the most preferred mode of one-on-one connections. Additionally, information is preferred in a printed format whether is comes from internet websites, trade magazines, and Cooperative Extension. Small producers are not likely to belong to commodity groups, pay consultants, nor seek agriculturally related information from community colleges. If the respondents receive information from the University, it will most likely come from Extension.

Extension should use significant resources to address the educational needs of smaller farmers. Topics should focus on the financial risks associated with beef cattle, hay, and sheep and goat production. Expanding their knowledge of irrigation, other water issues, and chemical application would not only allow small producers to better manage such resources but would enhance safe water supplies on an each farm within a water system.

Extension administrators have, in recent years, encouraged faculty to decrease one-on-one interactions with clientele and expand the use of video and group education methodologies with the intentions of improving efficiency of program delivery. However, new educational methodologies may not appeal to smaller farm operators. Small farm operators may choose to seek out other, non-Extension sources which provide information in the format of their choosing.

Yet, Extension has adapted to new technologies, changing issues faced by farmers, and limited resources throughout the years. Extension administrators and faculty must develop relationships with small farm and ranch operators, study their needs and choices for education, and deliver high quality programs

addressing specific clientele needs. Delivery may have to occur in atypical settings and times and using formats desired by an aging, educated, and increasing female audience.

From this study comes a better understanding of western producers' educational needs and the threats facing their operations. Researchers are cautiously optimistic that the end result may be twofold: a more efficient use of already scarce Extension resources and an enhanced adoption of risk management strategies by agricultural producers across the three states. University and Extension administrators across the West may want to revisit the relationship Extension has with its clientele. Survey responses to questions pertaining to the value of extension as a source of information have far reaching implications for Extension's ability to fulfil its mission and for the long-term sustainability of small farms and ranches. Unfortunately, it is difficult to predict how Cooperative Extension may respond to meet the educational and informational needs of today's small operators.

MODIFIED MARKETING EFFICIENCY CRITERIA FOR CONSIDERATION IN CROPPING STRUCTURE PLANNING: A CASE OF NEWLY RECLAIMED LAND FARMERS IN EGYPT

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Abstract

Suggested modifications on marketing efficiency criteria, inducing commodities' prices, extend use to comparison between diversified commodities sustaining choice among different production patterns. They are also used, along with production-marketing joint activities' benefit-cost ratio estimates, to assess the feasibility of undertaking certain marketing procedures by the producers themselves. Applications on a sample of farmers in newly reclaimed land area in Egypt proved feasibility only in few cases where producers were able to transport their produce of fruits to central markets. Farmers' bargaining power should be stronger if to be able to confront exploitation of the oligopolist middlemen, and hence become encouraged to expand production of major vegetables and fruits.

Keywords: marketing efficiency, cropping, planning

Introduction

Marketing conditions constantly stand as major determinants of any change in production patterns for any production activity, farming included. Many technically successful projects have failed and ceased continuity due to market problems which were not given sufficient attention within pre-feasibility studies. Possibilities of efficient marketing should be considered whenever choosing among alternative cropping structures, as well as among alternative marketing channels. Moreover, the monopolistic actions of whole sellers in certain markets exert a lot of stress upon small farmers depriving them of well deserved net returns, as sharing no more than 35-45% of the final consumer's price, hardly justified by the actual marketing costs. Accordingly, such exploitation may be confronted by farmers involved in marketing activities within their capabilities enabling to sell at higher price levels. The success of such actions depends on choice of marketing activities efficiently undertaken by the farmers themselves, ending with a situation better than when confined to mere production.

Accordingly, this study tends to suggest criteria for marketing efficiency enabling assessment of the feasibility of practicing certain post-harvest activities for sake of higher returns, as well as revealing cases of oligopoly of which marketing efficiency of middlemen is higher than that of marketer-producers but hardly explained by marketing costs differentiation.

Methodology

The paper suggests specific mathematical forms of financial analysis criteria applicable for marketing feasibility and for joint production and post-harvest activities. The suggested forms are tested on samples of middlemen and farmers of newly reclaimed area of West-Nubaria in North Egypt. The farmers' sample is heterogeneous , as composed of small traditional farmers, young recent graduates, and semi-large investors. To test the statistical significance for differences between efficiency estimates by different criteria the normal standard value "z" was applied as following: $z = (Xa - Xb) / \sqrt{X^*(1-X^*)(1/Na + 1/Nb)}$

where: Xa = marketing efficiency ratio estimate for commodity(or marketing channel) "a".
Xb = marketing efficiency estimate for commodity (or marketing channel) "b".
X* = the geometric mean of Xa, Xb. Na , Nb =sample sizes for "a" and "b", respectively.

Results

Traditional Marketing Efficiency Criteria

The most popularly used marketing efficiency estimators are represented by equations (1),(2).

$$\text{Marketing Efficiency} = 100 - \left(\frac{\text{Mar.c.}}{\text{Pro.c.}} \times 100\right) \qquad (1)$$

$$\text{Marketing Efficiency} = 100 - \left(\frac{\text{Mar.c.}}{\text{Mar.c.} + \text{Pro.c.}} \times 100\right) \qquad (2)$$

Where: Mar.c. = marketing costs Pro.c. = production costs

Such equations are proper for comparison among alternative marketing channels for a specific commodity eventually sold to consumers at the same price level. However, inclusion of certain marketing operations would end with quality variations reflecting on the price level, as well as the marketing costs. Hence, prices should be accounted for such as to test the feasibility of conducting such marketing operations. Analogous conclusions extend to commodity variation.

Marketing Efficiency Estimates For A Heterogeneous Commodity

If certain marketing operations are applied in order to advantage higher prices, such as grading, packing, processing, transport and/or storage, the gain in revenue should be compared to the additional marketing costs. Hence, marketing efficiency depends on marketing margins representing the difference between marketers purchasing and selling prices compared to the actual marketing costs. As such, marketing efficiency may be estimated as in equation (3).

$$\text{Marketing Efficiency} = 100 - \left(\frac{\text{Mar.c.}}{\text{Mar.m.}} \times 100\right) \qquad (3)$$

Where: Mar.m. = marketing margins.

As long as perfect competition prevails (monopoly nonexistent), eq. (3) estimates the financial marketing feasibility of executing any additional marketing service(s), and any positively signed estimate would justify application of such service(s).

Marketing Efficiency Estimates For Variant Commodities

Whenever comparing between different commodities the difference in production costs should be considered as they are expected to reflect upon retail prices. Accordingly, equation (4) would be appropriate for marketing efficiency estimation in this case.

$$\text{Marketing Efficiency} = 100 - \left(\frac{\text{Mar.c.} \times 100}{\sqrt{\text{Pro.c.} \times \text{Mar.m.}}}\right) \qquad (4)$$

Logically, and for sake of comparison among variant estimators, the square root of the product of production costs and marketing margins represents the ratio's denominator. Compared to similar estimates for conventional products decision can be made with respect to introduction of new products taking into consideration forecasted marketing potentials of the new products. This is also provided that perfect competition prevails.

Joint Production/Marketing Efficiency Estimation

Small producers in developing countries are usually exploited by middlemen who pay low prices and gain an unjustified great share of the retail price. Accordingly, some farmers may try to undertake themselves specific marketing operations such as to receive potentially higher prices for their products. Such action is to some extent practiced within the Egyptian agricultural sector, especially in newly reclaimed lands. As such, a joint production/marketing efficiency criterion may be adopted to test the feasibility of executing one or more of post-production operations by producers. The Benefit-cost ratio for the joint activity is represented by equation (5)

Joint B / C = TR / (Pr. c. + Mar. c.) (5)

Where: Joint B/C = the benefit-cost ratio for the joint production and marketing operation. TR = Total revenue, i.e. total value of sales Pr. c. = production costs Mar. c. = costs of executing the marketing operation(s)

This can be compared with the traditional benefit- cost ratio represented by equation (6)

B / C = TR / Pr. c. (6)

Applications

Table (1) presents a comparison between estimates of alternative marketing efficiency criteria for some major vegetable and fruits products of producers in newly reclaimed land , West-Nubaria Region, Egypt.

According to traditional estimators, as shown in table (1), high efficiency occurs for all chosen crops with a slightly lower level for citrus. Likewise, analogous results occur when adopting the modified criteria for middlemen practices, negligibly different from the traditional criteria estimates. On the other hand, a dramatically different situation occurred for farmers' marketing efficiency, with a single exception for the case of grapes. The worst situation occurred for citrus where a drastic loss resulted when production was accompanied by conduction of several marketing operations. Such finding may be due to farmers' disability to reach final consumers or more important the exporters who deal with a great bulk of the produce and offer much higher prices for the thoroughly graded product.

It is worth mentioning that testing the statistical difference between the different criteria estimates, using "z" standard value, indicated significant differences between traditional and modified estimators for farmers only, beside a single case of citrus for middlemen marketing practices.

Table 1: Marketing efficiency estimates by both traditional and modified criteria for both middlemen (Mid.) and farmers (Far.) of West- Nubaria reclaimed land in Egypt, for some major vegetables and fruits

Crop	Traditional		Modified			
	Eq. (1)	Eq. (2)	Eq. (3)		Eq. (4)	
			Mid.	Far.	Mid.	Far.
Potatoes	**87.6**	**89.0**	**90.5**	**8.6**	**89.1**	**- 6.0**
Tomatoes	**88.3**	**89.6**	**88.3**	**33.2**	**88.3**	**72.0**
Citrus	**71.9**	**78.1**	**68.7**	**- 55.0**	**70.3**	**34.0**
Grapes	**93.8**	**94.1**	**93.8**	**46.0**	**93.8**	**82.0**

Source: Analysis Of Data Collected For: Shafik, F.A. "An Economic Marketing Study of Some Major Crops In Newly Reclaimed Land" Ph.D. Thesis, Faculty of Agriculture at Moshtohor, Zagazig University, Egypt,1998.

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As for investigating the feasibility of joint production-marketing activities, table (2) presents the benefit-cost ratios of production and production-marketing activities for a sample of farmers in West-Nubaria and for the chosen crops.

As Shown in table (2), it is economically rational for farmers of the newly reclaimed land, under the ongoing conditions of oligopolistic marketing, to confine their economic activities to production. However, it may be fruitful for farmers to undertake specific marketing operations for the fruit crops, especially transport to central markets. That was confirmed by testing the significance difference between the estimated cost ratios, using again value

"z", where statistical significance was confirmed particularly for the case of citrus . Such results coincide with earlier results of marketing efficiency estimates presented in table (1).

Table 2: Benefit-cost ratios for production and production-marketing activities of selected vegetables and fruits for farmers of West-Nubaria

Crop	production	Production, picking, grading and packing	Production, picking, grading , packing and transport
Potatoes	2.0	2.0	1.4
Tomatoes	1.5	1.6	1.3
Citrus	1.2	1.4	1.7
Grapes	1.6	1.7	1.7

Source: Ibid

Discussion and Conclusions

Results show that the modified criteria for marketing efficiency for middlemen have rendered estimates slightly different from those given by traditional criteria. However, the modified criteria are widely applicable whenever comparison is required among different products, or even different quality levels of a specific product due to different marketing handling. On the other hand, a different situation emerges in the case of marketing operations being partly or entirely undertaken by the producers themselves. The revealed drastically lower marketing efficiency of producers, i.e. farmers of newly reclaimed land, is not entirely due to higher marketing costs, but more influential is the oligopolistic marketing condition forcing producers to accept prices less than one-half retail prices no matter how simple the marketing procedures are. Due to limited resources, urgent need of cash and poor market experience, farmers generally have low bargaining skills, especially confronting exporters. As such, losses occurred whenever marketing procedures were entirely executed by farmers, as revealed in case of potatoes and severely for citrus, both being exportable crops. Nevertheless, as an exceptional case, considering marketing operations which were managed and properly conducted by relatively big and capable producers ,especially grading and transport to principal central markets, those producers advantaged relatively high prices mounting up to 184% of average retail prices for certain fruits, and hence were able to secure higher benefit-cost ratios for joint production-marketing activities. However, as mentioned above, the oligopoly condition dominant in markets of most crops discourage most marketing activities undertaken by farmers themselves despite their remarkable profitability realized when executed by middlemen.

Conclusively, the selected vegetable crops are economically better within the cropping patterns of newly reclaimed land farmers, of which small farmers constitute the majority, whether considering marketing potentials or not. Moreover, farmers are in great need of more collective power to confront the market oligopolists and experience better access to retail markets. Otherwise their scattered efforts would remain in vain.

Summary

The study suggested certain modifications on the commonly used marketing efficiency criteria such as to extend their use to different commodities or even variant grades or quality levels of a particular commodity. Modifications are based on inclusion of the commodities' prices, comparing added value due to marketing application by the cost of such application. Although applying these modified criteria to marketing of specific principal vegetable and fruit products of newly reclaimed land certain region in Egypt showed no remarkable changes in efficiency estimates than rendered by traditional criteria for middlemen specialized in marketing, the case was different for farmers who followed their production activity with certain marketing procedures. Although farmers were able in few cases to sell their produce at the main central markets at nearly 1.8 times the average farm-gate price after conduction specific marketing operations, they should generally confine their activities to production to avoid unnecessary losses. The situation may change if farmers were able to upgrade their bargaining power such as to confront exploitation of the middlemen who share alone more than half the final consumer's payments, which may be much higher than fairly earned through the relatively simple marketing procedures they perform.

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RIGHTRISK: RISK MANAGEMENT TRAINING FOR AGRICULTURAL MANAGERS IN THE RURAL UNITED STATES

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Abstract

RightRisk is an Extension education program offered across the rural United States since its inception in 2002. Team members offer these programs using portable computer labs and web-based software to managers located in remote locations from the bottom of the Grand Canyon to the windswept-plains of Wyoming. Program offerings have expanded beyond the risk simulation – Ag Survivor – to include a ten-step process for strategic risk management with accompanying tools for implementation. Additional courses covering other dimensions of risk management have been developed, including: Feasibility of Alternative Rural Enterprises, Taxes for Agricultural Enterprises, and a two-module course entitled A Lasting Legacy. Alternative scenarios, covering various agricultural enterprises, make the simulation relevant to managers of rural farms and ranches. This flexibility and broad relevance of the fundamental concepts presented make these educational programs appealing for application in other rural areas.

Keywords: rural family, enterprise management, risk management

Background

U.S. farm policy enacted since 1996 has punctuated the need for agriculture producers to understand and manage risk. Risk management is difficult to understand and teach, both because the concepts are difficult and the breadth of problems and solutions are great. However, there is a need for risk management education. The U.S. farm economy is a higher-risk economic environment than agricultural families have seen since the 1930s (Fetsch, Bastian, Kaan, and Koontz, 2000). The need for further education is confirmed by a recent survey of producers (Kaan, et al., 2000). For those who provide education and Extension workshops to agricultural producers and their families, this is often a daunting task, given limited resources and the paucity of empirical studies on farmers' and ranchers' needs for risk management information and education.

While a great deal of our current understanding about risk education in agriculture was developed in the 1970s, the tools for accomplishing manager-directed education have evolved greatly since then, with the increasing power and reduced cost of portable microcomputers. Improvements in technology translate, in this case, into an increased power to teach complex, risk management concepts.

“RightRisk” (RightRisk.org) is an example of one program developed by a team of U.S. Extension educators and researchers from ten (10) western states, which utilizes new technologies in risk management education. The group’s stated focus is to help farmers and ranchers understand and explore risk management decisions and evaluate the effects of those decisions.

Ag Survivor

Ag Survivor is one of the primary education tools used by the RightRisk Team. *Ag Survivor* is a risk simulation which allows users to experience making risk management decisions. Several alternative scenarios have been developed for the simulation, including: King Family Ranch, Wheatfields, Lazy U Ranch, EWS farms, with several more in development. The scenarios are assembled using actual production, weather, local markets, likelihood estimates, and other risk information to create a representative operation for a specific geographical area and type of operation. The resulting *Ag Survivor* scenario allows users the opportunity to manage one or more virtual agricultural enterprise without taking real-world risks with the potential of loosing the farm.

Typical risks faced in an *Ag Survivor* simulation may include:

- Production risk- such as: a poor hay crop due to too much or too little precipitation, low weaning weights due to drought conditions, low crop yield or poor quality due to insects or disease.
- Marketing risk- such as: higher/lower prices due to changes in the national corn markets, changes in price due to hay production, differences in prices with timing of sales, retained ownership strategies.
- Other risks such as human resource risk or legal risk- for example, sickness or heart attack on the part of the manager or a lawsuit filed in conflicts over rangeland management.

Controls offered to manage risks in *Ag Survivor* scenarios include:

- Production risk- insurance policies for protection against low yields, low revenue, or both; strategies offering protection against shortage of a critical input, such as buying more hay than needed; or options to retain ownership in order to reap all the weight-gain benefits from a certain group of animals.
- Marketing risk- strategies that help insure against downward trending prices, such as forward contracting, hedging, or options contracts; insurance products that offer protection from low revenues; or by timing the sale of commodities for periods which historically report annual high prices.

Simulation Outcomes

After participant teams have made their management decisions, results are compared on a cash-only basis. At this point teams are encouraged to discuss the strategies they used and whether the strategy chosen seemed to be a good one or not. Following this exchange, teams are informed that a simulation is available and that the results will allow for a statistical comparison of results for greater accuracy. Simulations for each team are then computed for 100 iterations of the strategies entered. This allows for the probabilities of the various risks to play out, creating a distribution of results. Annual returns information is presented to each team as a histogram with descriptive statistics.

Using the histogram and summary statistics as a basis, the presenter then engages the teams in a discussion of the results. One of the first questions asked is how to determine which are the better results. This allows the group to explore different possibilities for measuring outcomes: high average income, consistent results as measured with a lower standard deviation, a strategy which yields the highest minimum return for the group, or a set of decisions leading to the highest maximum return. In addition, points are made about the tradeoffs between these results, such as a strategy with a high maximum return which also very likely has a high standard deviation. Emphasis is made that individuals must decide for themselves the level of risk they are comfortable with and that there are not a single set of correct answers.

Where time permits, the discussion is directed toward comparing strategies. Alternatives such as maxi-min, mini-max regret, safety first, etc. are explained using a simple example. Teams are then challenged to revise their pattern of decisions from the previous round to achieve a more desirable outcome following a particular strategy. In this way, *Ag Survivor* serves as a centerpiece for risk management education and facilitates an exchange of ideas about strategy selection and evaluation. Participants are left with the RightRisk.org URL, where they may access several of the simulations online for further risk management practice.

Workshop participants range from commercial agriculture producers, small farm owners, retired commercial operators, beginning and young farmers, and college classes. Over 150 workshops have been offered since the inception of *Ag Survivor*, spanning at least 17 U.S. states. Group sizes range from just a handful of participants to about 100 when offered at the annual Colorado Wheat Grower's meeting.

Most users are very complimentary, offering comments such as: "*More fun than real life because you could experiment with a potentially bad decision without having to experience the real consequences" or "'Instant analysis and results based on management choices made. Non-impact scenarios are fun and helpful."* Another participant observed, that the "*Easy, laid back learning experience* [is] *very conducive to thinking and learning*."

Further and perhaps surprisingly, participants do not always need to be familiar with the scenario selected. In a recent program in Massachusetts a western, dryland wheat scenario was used with a group which included: a dairy operator, a pumpkin grower, a couple who manage an alpaca enterprise and a 200-member Community Supported Agriculture (CSA) enterprise mostly under glass, a hay grower, and one cow-calf producer, among others. The group was very receptive, with one participant commenting it was an "*Interesting presentation* [which offered a] *new way to look at production."*

Scenario Guides and Fact Sheets

The RightRisk Team has authored several scenario guides to accompany the *Ag Survivor* simulations. These guides provide additional background information about the scenarios, including the risks, probabilities, and consequences faced by simulation users. These guides, along with fact sheets and other information on risk management, are used to provide some consistency of presentation to workshop attendees, as well as provide information for individuals seeking greater depth of coverage outside the workshop setting. These materials are grouped into five resource categories at RightRisk.org for further investigation: building basic skills, risk management lessons, scenario based lessons, instructor's manual, and links to other online resources.

Strategic Risk Management Process

Ag Survivor represents a valuable tool for enticing agricultural managers to consider risks present in their operations. The proactive manager, however, requires tools to help implement changes designed to manage those risks in a manner consistent with their risk tolerance and business' ability to support risk. Members of the RightRisk Team are developing those tools as part of a planning model called Strategic Risk Management, a 10-step process for managing risk in agricultural operations.

Figure 1: The Strategic Risk Management Process

Figure 1 shows the "SRM process" in diagram form. It is derived from a customized, traditional strategic planning process to fit risk management. The process assists agricultural businesses in developing a risk management plan that takes into consideration resources available (including management ability), risk preferences, and the long term goals of the operation and families involved.

The process is divided into three main parts: strategic, tactical, and operational. The "SRM process" involves a series of ten specific steps. The process is cyclic with feedback and reevaluation as conditions change. Management decisions are based on operation goals, actual performance, and considering current and forecast conditions, including risk. The specific steps in the process include:

Determine Financial Health

Financial health, much like health in other contexts, refers to the practice of assessing the well-being of the financial resources of a business. This process will usually identify areas of both financial strength and weakness within the business. In addition, the practice may help identify areas of under-utilized capacity, perhaps offering the option to capitalize on developing opportunities.

Determine Risk Preference

There are three basic preferences for risk exhibited by people. People exhibiting risk neutral preferences seek to maximize income, while ignoring the presence of risk. Risk loving people seek risk, just as people who have an addiction to gambling do. Most people exhibit risk averse preferences. Risk averse people are willing to give up income to avoid risk. For example, suppose that a person is expected to lose an average of $600 per year from automobile accidents over their lifetime. Of course, it is not $600 every year. An accident carries a big price tag if and when it occurs. Most people are willing to pay more than $600 per year to avoid the risk of facing a large settlement. If a person were to pay $800 per year for car insurance, they would be demonstrating a willingness to pay a $200 premium above and beyond the cost of insurance to avoid the risk of paying a large settlement. Likewise, a farmer or rancher might accept lower profits from a marketing contract that reduced his or her price risk.

Establish Risk Goals

After establishing preferences for risk, the next step in the "SRM process" is to set risk goals. This is an extremely important step because goals guide the rest of the planning process. Goals should identify both family desires and where the business should be in 5 to 20 years.

Determine Risk Sources

The first step in the tactical phase is to determine when and where risks come from and to prioritize where risk management efforts will pay off most. There are five major types of risk: production risk, market or price risk, financial risk, institutional risk, and human resource risk. In addition, there are many sources of risk and controls available for management.

Identify Management Alternatives

There are four basic ways to manage risk: assume it, avoid it, reduce it or transfer it. The objective is to find the appropriate trade-off between the risk and achieving personal goals. Some people will choose to assume risks in order to capture the returns that are often associated with it. Of course, even someone that assumes risk will also try to reduce it. At the other extreme, some people are so uncomfortable with uncertainty that they will avoid risks altogether. Risk also can be transferred to other people that are better prepared to handle it.

Estimate Likelihoods

The next step in the "SRM process" provides the tools for estimating the likelihood for various alternatives. Steps in the "SRM process" provide detailed descriptions of probability density functions, using statistics for prediction, how to interpret them, and how to compute them.

Rank Management Alternatives

The final step in the Tactical stage of the "SRM process" is to rank the various alternatives considered and select those with the most desirable outcomes. Two or more risks may be compared by looking at the returns, the probability of good and bad outcomes, and including the personal risk preferences of the decision maker.

Implement Plans

Ultimately, the management team should put whatever plans have been made into action. Implementation of the plan involves acquiring the necessary resources, scheduling the tasks to be completed, and overseeing all aspects of the plan.

Monitor & Adjust

Resource use must be monitored and adjustments made as needed. Rarely are plans implemented exactly as outlined in paper. Particularly where uncontrollable-factors such as whether and markets are involved, implementation and execution must be monitored and mid-course adjustments made if goals and objectives are to be realized.

Replan

Re-planning is often ignored, probably because it tends to highlight what was not achieved. Recognizing what was not accomplished is the first step toward addressing any deficiencies responsible. Although re-planning occurs throughout the year as resource use is monitored, it should also occur at year end.

The "SRM" 10-step, process is ongoing into the foreseeable future. While some strategic goals and objectives will be met, others will prove too difficult or conditions will change to make them unimportant or too costly to achieve. That outcome is reasonable and acceptable. Progress toward those goals which are most important will provide many positive returns, particularly if systems are implemented to allow management the capability of measuring progress over time.

Other Rightrisk Courses

Additional RightRisk courses assist the farm and ranch manager looking to improve their risk management skills in specific areas. The first of these is a course entitled *Feasibility of Alternative Rural Enterprises*. Many managers of commercial agriculture enterprises and small rural landowners alike are actively considering alternative enterprises. However, most are unclear how to thoroughly evaluate these alternatives to ensure success if adopted.

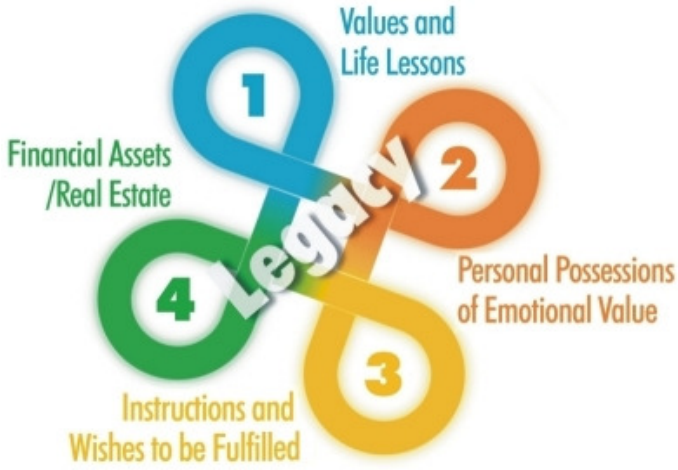
Feasibility of Alternative Rural Enterprises takes the user through the process of evaluating alternative enterprises from a number of perspectives, after an introduction which provides examples of several alternative enterprises. Evaluation of alternatives is accomplished by considering: level of interest, SWOT (strengths, weaknesses, opportunities, and threats) analysis, feasibility assessment, competitive analysis, business planning, and risk considerations. As the user completes each section of the course, interactive activities take input, which is recorded and complied to provide feedback to the user. Worksheets and other course materials provide additional content.

Taxes for Agricultural Enterprises provides a step-by-step interactive course that takes producers through the various terms, definitions, and strategies for managing taxes. The course is not meant to replace advice from an accountant or to be a comprehensive do-it-yourself tax guide. It is, however, designed to educate producers and increase their awareness of tax management strategies.

The course begins with definitions of for-profit or a qualified farm, which determine how the operation is treated by the IRS. The importance of good record-keeping is emphasized in the next phase of the course. Emphasizing that it is increasingly important to keep good business records, not only for tax purposes, but also for the overall performance of the business. The course proceeds with a presentation of the various classifications of farm income and expenses. The expense portion of the course addresses common questions relating to what is defined by the IRS as expenses. Each course section of *Taxes for Agricultural Enterprises* includes a worksheet with several questions and scenarios allowing users to test their knowledge as they go. As such, it provides producers insights on tax management strategies in a step-by-step manner.

Finally, a pair of courses entitled *A Lasting Legacy* provide rural families assistance with end of life planning. Many agricultural and family-owned enterprises fail in the transfer of control between one generation and the next. In fact, across the U.S. only one in three enterprises survive beyond the third generation. As such, this transfer and other end of life issues represent one of the greatest threats to the long term survivability of family-owned businesses.

Figure 2: The Lasting Legacy Model



A general model provides a conceptual framework for describing a legacy. Figure 2 is a graphical representation of that framework. In general, there are four major headings for the material covered by the courses: values and life lessons, personal possessions of emotional value, instructions and wishes to be fulfilled, and financial assets/real estate.
Topics addressed across the two-course series include:
Course 1- What is a Legacy, Parent/Adult Child Relationships, Managing Intergenerational Relationships, Improving Communication, Values and Life Lessons, and Personal Possessions of Emotional Value.
Course 2- End-of-Life Issues, Pre-Death Wishes, Final instructions, Estate Planning, Financial Planning, Transferring Real Property, and a Course Summary.

Each of these four additional RightRisk courses includes the following components:

- A resources section for further reading and investigation,
- Links to course worksheets, videos, and other supplemental material,
- A glossary with definitions for course terms and acronyms,
- Presenter resources including a teaching outline, PowerPoint files with notes for all slides presented, and
- Advertising materials for using in marketing the courses.

Finally, each course concludes with an email survey form to allow users to provide feedback on their effectiveness. Originally published as CD-based materials, the courses are also available at the RightRisk.org web site for online viewing.

Conclusion

Risk management is difficult to understand and teach, both because the concepts are difficult and the breadth of problems and solutions are great. The tools for accomplishing manager-directed education have evolved greatly since the 1970s, when a great deal of our current understanding about risk education in agriculture was developed, with the increasing power and reduced cost of portable microcomputers.

The U.S.-based RightRisk Team has developed a risk simulation *Ag Survivor* which has been presented in over 150 practitioner-oriented educational programs across the United States. Team members offer these programs using portable computer labs and web-based software to managers located in remote locations. Sessions have been well received by participants but serve primarily to raise awareness of the need for additional risk management education.

Most recently, program offerings have been expanded beyond the risk simulation to include a ten-step process for strategic risk management with accompanying tools for implementation. Additional courses covering other dimensions of risk management include: *Feasibility of Alternative Rural Enterprises*, *Taxes for Agricultural Enterprises*, and a two-module course entitled *A Lasting Legacy*. Alternative scenarios, covering various agricultural enterprises, make the simulation relevant to managers of rural farms and ranches. This flexibility and broad relevance of the fundamental concepts presented make these educational programs appealing for application in other rural areas.

COMPETITIVENESS OF MILK PRODUCTION IN IRELAND

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Abstract

This paper seeks to examine the competitiveness of milk production at farm level in Northern and Southern Ireland where different dairying regimes have existed in relation to milk quota policy. Competitiveness is a comparative concept and thus the profitability of dairy farms has been compared with the average wage rate in the country. Full economic costs of milk production in Ireland have also been examined. Data from dairy farms is collected in two separate on-line benchmarking databases in Ireland – e-profit monitor in the Republic of Ireland and Dairy Benchmarking in Northern Ireland. Results from these systems have been compared to those from other countries through European Dairy Farmers (EDF) (the authors represent their countries on the EDF Scientists Team for Research and Analysis). E-profit monitor includes approximately 8% of the dairy cows in Southern Ireland while the equivalent figure for Dairy Benchmarking in Northern Ireland is 10%. Results have shown that Irish cash costs per litre of milk (both North and South) are competitive in Europe. If imputed charges for owned land, capital and family labour are applied, the competitive advantage of Irish milk production is less pronounced.

Keywords: milk production, competitiveness

Introduction

The term "competitiveness" refers to characteristics that permit a business to compete effectively with other businesses due to lower costs or higher profits. Dairying as a business must be profitable for the individual farmer if milk production at national level is to be competitive in the world market against other countries. Competitiveness of milk production at farm level is dictated by a plethora of variables but central and key to the success of an individual business is the calculation of margin per litre of milk produced (regardless of the measure of margin used) times the total number of litres produced by that business.

In Ireland, as in all other milk producing regions of the EU, dairy farmer numbers are falling with milk produced per farm increasing. A typical rate of decline in dairy farm numbers is around 4 – 5%. In Northern Ireland, dairy producer numbers have halved since milk quotas were introduced while total cow numbers have remained fairly constant. Milk yield per cow has increased by approximately 2,000 litres per cow meaning that total farm production has increased by a factor of 2.89 since quotas were introduced. The most progressive farms in the region have doubled their total milk output in 10 years.

Figure 1: Milk production in Northern Ireland since the introduction of milk quotas

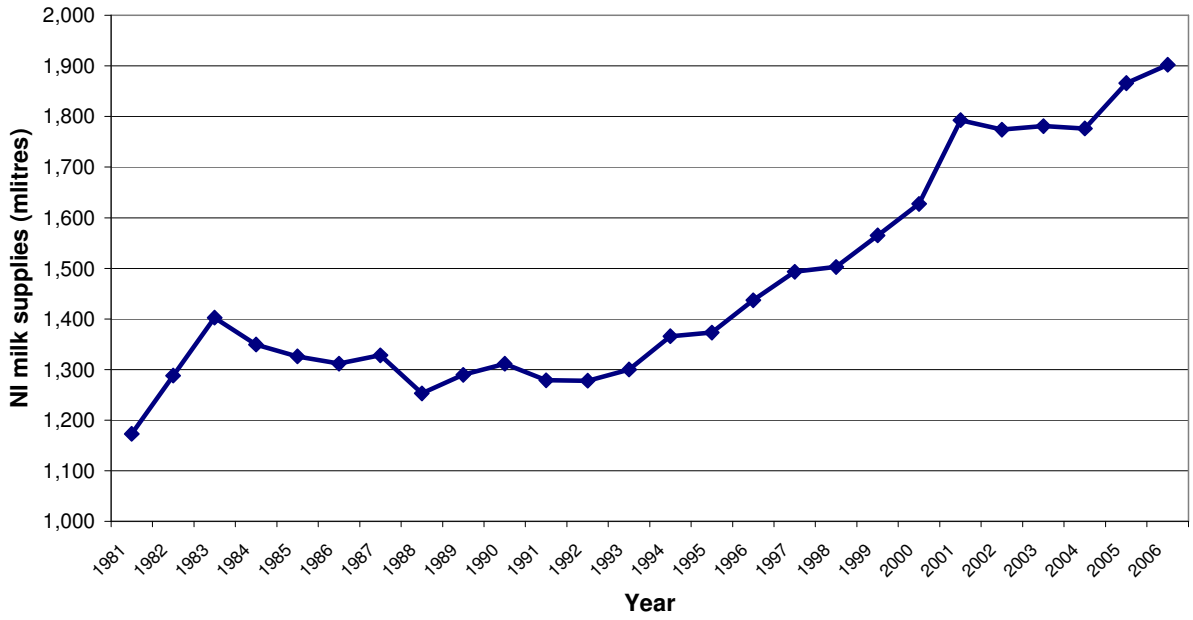


Figure 1 shows that milk production in Northern Ireland has increased markedly in recent years. Up until 1st January 1994, milk quota in the UK could not transfer between the GB mainland and Northern Ireland. From that date, inter-regional transfer became possible and since then milk quota has migrated – predominantly to the better grass growing regions in the UK – of which Northern Ireland is one. The permanent Northern Ireland milk quota held by farmers is up 540 million litres since 1994.This is equivalent to 3.9% of total UK milk quota.

In the Republic of Ireland, the total milk quota is 5,085 million litres. Due to external and internal pressures on dairy farmers, the numbers involved in the sector have and will continue to decrease as Table 1 highlights.

Table 1: Number of Milk Producers and Quota Size by Year in the Republic of Ireland

	2000	**2002**	**2004**	**2005**	**2015***
No. Producers	29,071	26,635	23,767	22,300	15,000
Ave Quota Size	170,720	188,506	213,955	227,000	

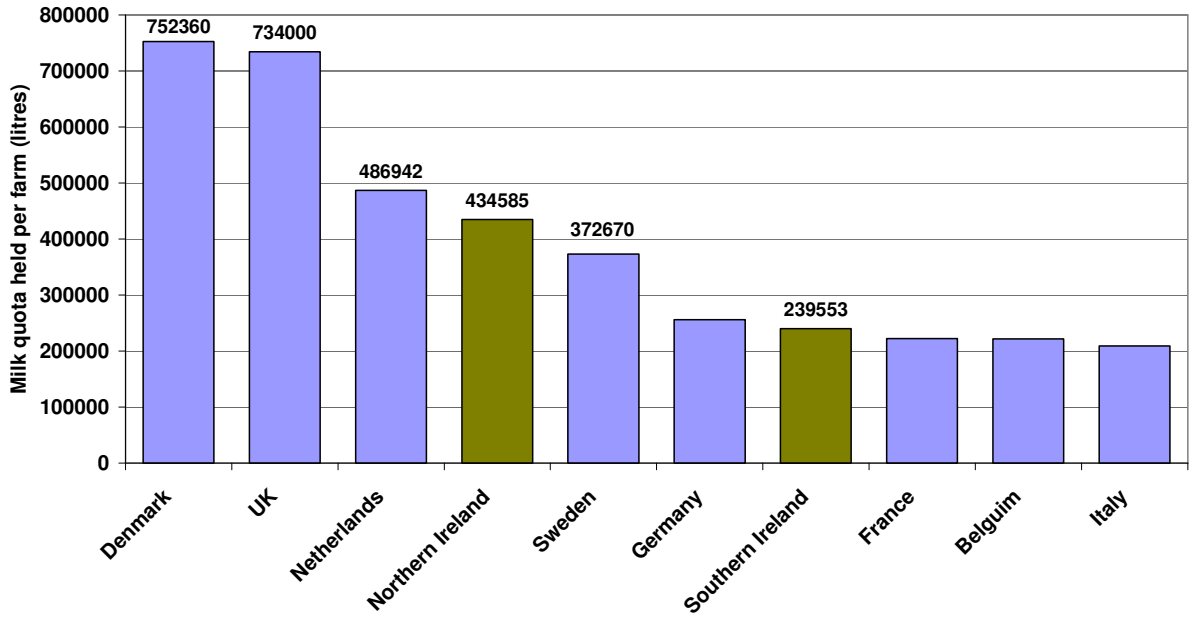
* Projected by Agri-Vision 2015 Committee

Source: Dept of Agriculture

Since 2000 the numbers exiting dairying per year has been 4.5%. This has resulted in quota size per producer increasing to almost 240,000 litres in 2006/07 (see figure 2), an increase of around 40%.

Overall, there will be fewer specialised dairy farmers who will have larger herds. They will need to be strong financial managers, technically well informed, while operating a system of farming that minimises labour requirements.

Figure 2: Dairy farm scale in Northern Ireland and Southern Ireland compared (2006/07) to other EU countries.

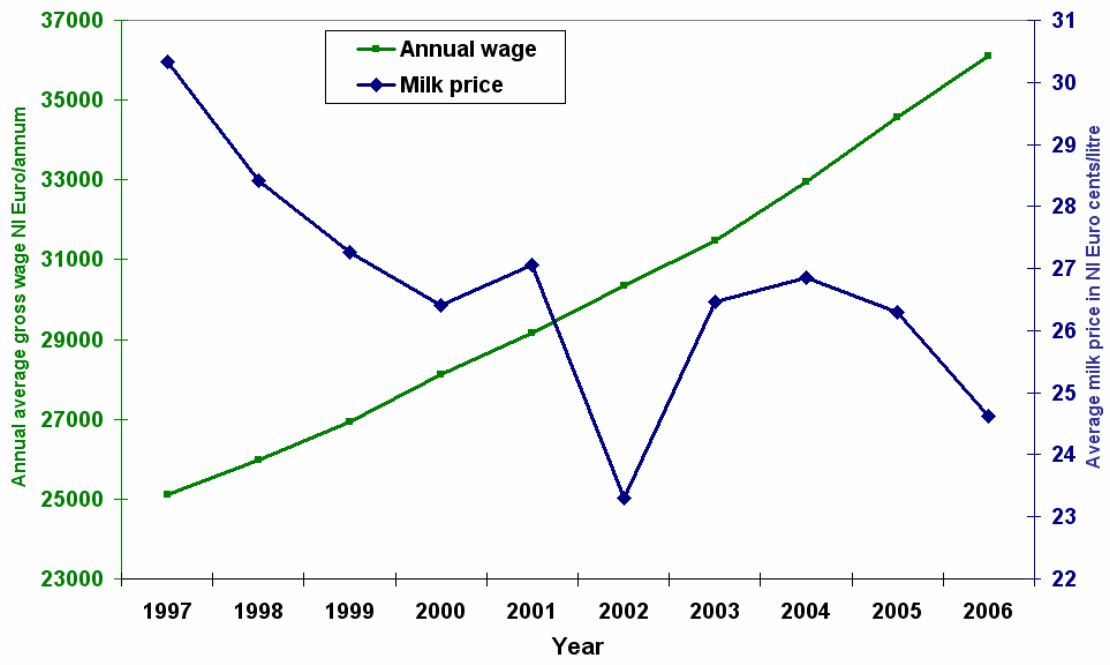


The total number of litres produced by a dairy farm is one very rudimentary measure of competitiveness. Figure 2 shows that while Northern Ireland is a long way behind the UK in terms of quota held per dairy farm, it is ahead of the average in many other countries. This is positive for dairying in this EU region however it is by no means a guarantee of success for individual farmers.

The Influence of The Wider Economic Environment

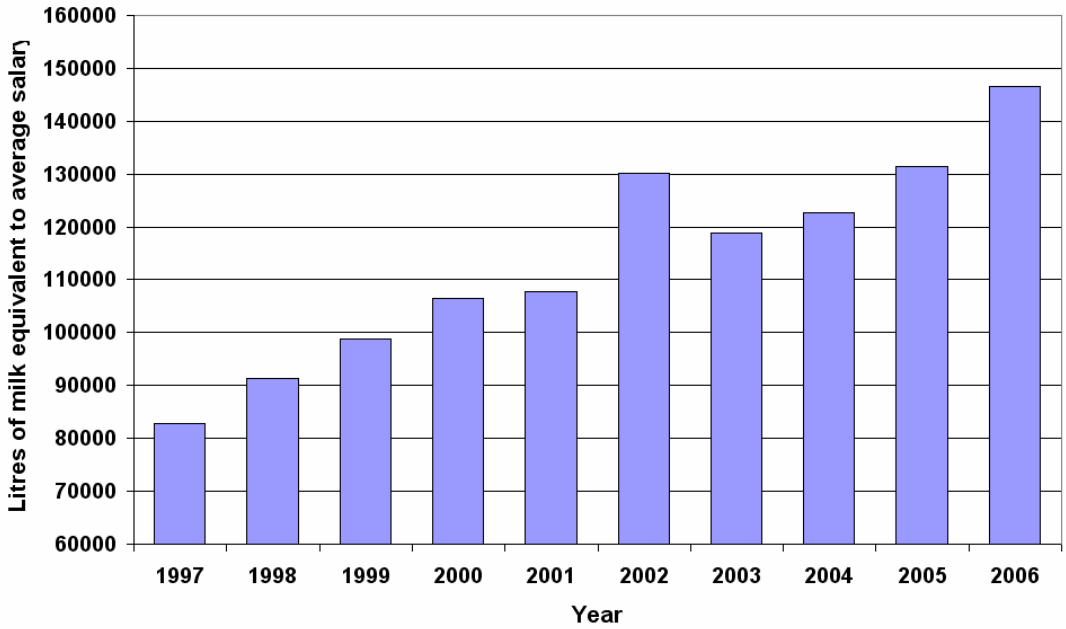
Dairy farming is a relatively labour intensive industry. The Irish dairy farming industry is characterised by predominantly family owned and operated units. This does not, however, mean that they are immune from the influence of economic prosperity outside of agriculture. The "pull factor" of improved working conditions and higher wage rates outside of agriculture has meant that succession on family farms has become more difficult with good employment prospects for young people seeking employment off-farm. The unemployment rate in Northern Ireland, for example, has consistently remained at between 4 and 5% for the last five years. Since milk quotas were introduced, the number of people employed by the private sector has increased by 70%. Figures 3 and 4 probably are the most striking illustration of the comparison of dairying with other industries in more recent years.

Figure 3. Comparison of the farmgate milk price in Euro cents per litre (right hand scale) with the average gross annual wage in Northern Ireland per annum for all workers in Euros (left hand scale)



All costs in GB pounds sterling converted to Euro at 0.68 Euro per GBP.

Figure 4. The number of litres of milk (at farmgate price) required to pay an equivalent average wage in Northern Ireland



It can be seen from figures 3 and 4 that to maintain a standard of living equivalent to that of their counterparts, dairy farmers have to expand (more easily possible in Northern Ireland due to the migration of milk quota from England) or become much more efficient as in the Republic of Ireland (assuming that milk price remains static).

Data for Costs of Milk Production In Ireland

Data from dairy farms is collected in two separate on-line benchmarking databases in Ireland – e-profit monitor in the Republic of Ireland and Dairy Benchmarking in Northern Ireland. E-profit monitor includes approximately 8% of the dairy cows in Southern Ireland while the equivalent figure for Dairy Benchmarking in Northern Ireland is 10%. Farmers are not randomly selected for either system and thus they cannot be considered to yield average results for either country. It is the larger and more progressive farmers that use the costing programs on line and thus results could be considered above average.

The following paragraphs give some of the highlights of the results from both systems for the 2005/06 milk quota year (April to March).

Overhead Costs on Benchmarked Farms (Northern Ireland)

As a dairy farms expands, it is generally assumed that many categories of overhead costs will not increase in proportion with the increase in herd size. When looking at overheads costs per litre, figures can be mis-leading as only a proportion of overheads are allocated to the dairy herd and production per hectare can dilute the total figure. In order to examine overhead costs in more detail, total overheads in various categories have been extracted from benchmarking results. Four different herd size bands were selected with herds +/- 10 cows around 50, 100, 150 and 200 being investigated. It would automatically be assumed that the overhead costs for a 200 cow herd should be less than 4 times that of a 50 cow herd. In Table 2, it can be seen that overhead costs on the 200 cow farms are actually 4.8 times those on the 50 cow farms. While cost centres like utility costs are 3 times larger, cost centres like paid labour, interest, conacre and contractor all show increases well in excess of 4 times. It should be noted, as stated previously, that the larger herds have higher stocking rates. This is again apparent with the area farmed on the 200 cow farms just over 3 times that on the 50 cow farms. If the family labour charge is considered in addition to total overhead costs, the 200 cow farms have a total just over 3 times that of the 50 cow farms. Overhead costs are often referred to as “fixed costs”. Table 2 emphasises that they should be referred to overhead rather than fixed costs. In fact, many vary almost proportionately with cow numbers. Dairy farmers should continually examine all areas of overhead costs to ensure they remain controlled. If expansion of a dairy herd is planned, overhead costs should not be underestimated

Table 2: Total overhead costs for farms with 50, 100, 150 and 200 cow herds – financial figures given in Euro

	50 cows	**100 cows**	**150 cows**	**200 cows**
Machinery running costs	6,669	12,468	21,119	24,265
Contractor costs	3,453	9,244	17,066	18,766
All depreciation	9,788	21,379	31,553	31,472
Electric, phone, water, rates	3,950	6,891	11,582	12,156
Paid labour & NIC	984	3,859	10,137	16,965
Property repairs	2,379	5,296	9,901	11,206
Miscellaneous	3,835	5,900	10,444	13,037
Conacre	2,654	7,971	12,776	17,434
Interest only	2,046	7,671	11,187	27,813
TOTAL overheads	35,760	80,678	135,768	173,115
Land farmed	43	70.8	102	138.9
Family labour units	1.22	1.57	1.79	1.91
Family labour charge	42,781	55,054	62,769	66,976
Milk yield X stocking rate	12,292	15,346	18,250	15,533

Costs of milk production

The cost of milk production can be calculated in a number of different ways. Figure 5 has been calculated on the following basis:-

Variable costs for the dairy herd + overhead costs allocated to the dairy herd (based on land area used by the dairy cows) + adjustment for calf output and replacement costs + imputed charge for family labour

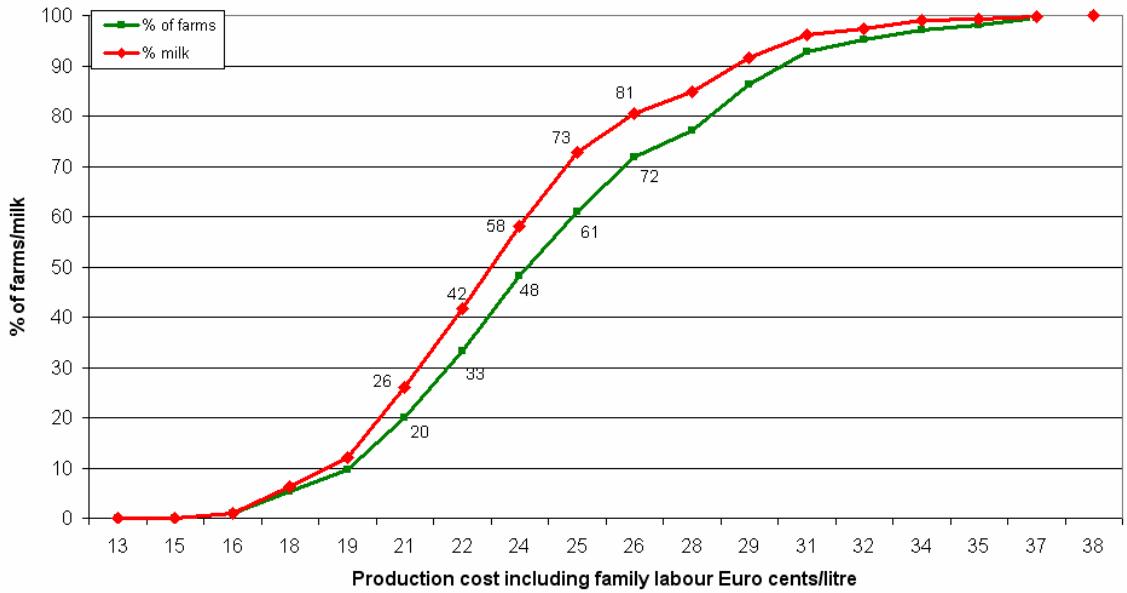
A few important notes on this calculation:-

- An imputed charge for owned land has not been included.
- Labour has been allocated to the dairy herd on the same basis as overhead costs.
- The charge imputed to one family labour unit has been taken as the average wage in Northern Ireland from the Department of Enterprise, Trade and Investment Northern Ireland Annual Survey of Hours and Earnings (ASHE). This figure in the 2006 survey was an annual wage of 35,066 euros.
- The Single Farm Payment is not included in the calculation of production costs.

Figure 5 shows the percentage of farms or milk that can be produced at a given milk price based on the above calculation. It is best understood by considering either end of the graph. At a milk price of 16.2 euro cents per litre, no milk can be produced for a cost of production below this. At 38.2 euro cents per litre, all milk is produced at a cost less than this. The "steep" area of the graph occurs between a milk price of 22 cents and 26.5 cents. At a milk price of 26.5p, 72% of farms could produce milk at a cost below this. However, at 22 cents only 33% of farms can produce milk at this cost. Thus, even relatively small falls in milk price below 26.5ppl puts economic pressure on a relatively large number of farms. Dairy farms would critically assess whether they should remain in production at these price levels and milk supply could be reduced in the longer term if prices in the region of 23.5 – 25 cents per litre were maintained. Remember also that benchmarked farms are generally better than Northern Ireland average.

The main feature of the farms producing milk at the lowest costs seems to be a low labour charge per litre. This results from efficient use of labour and, in some cases, family members working much longer hours than has been costed in this exercise.

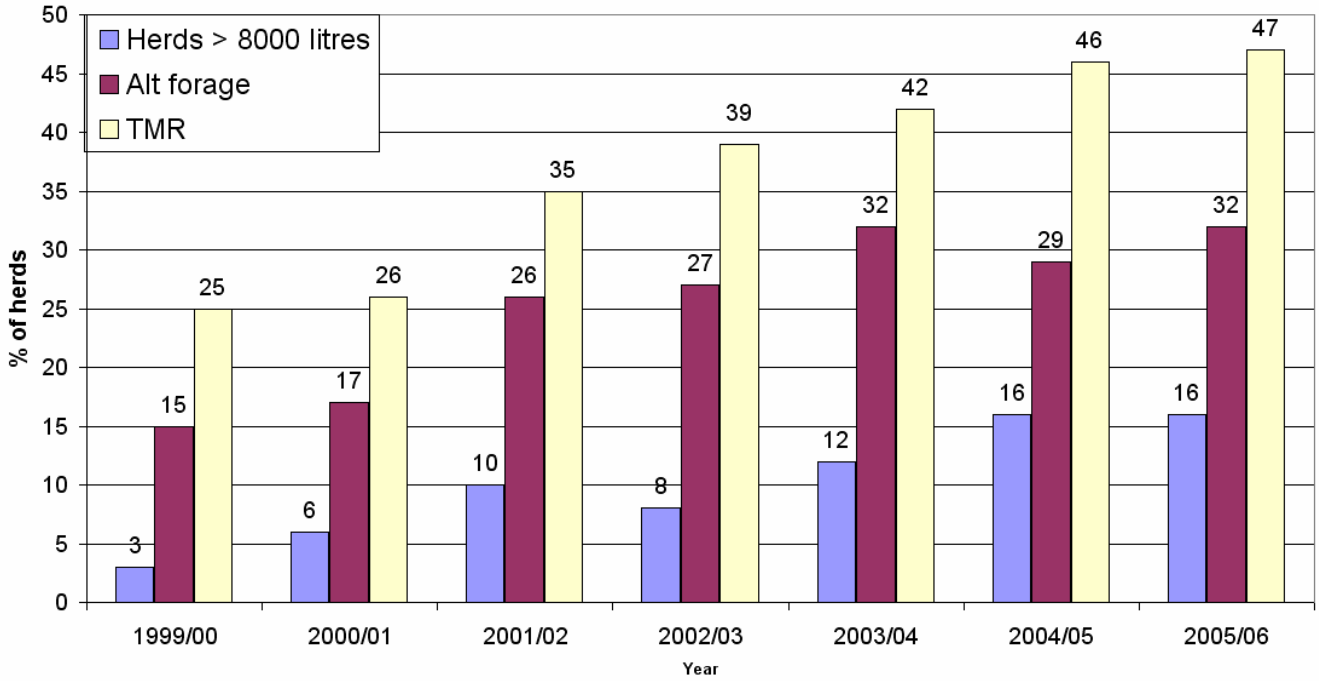
Figure 5. Cumulative % of milk produced at various production costs



Trends on Benchmark Farms

Greenmount Benchmarking allows for the analysis of long-term trends on dairy farms due to the large database of information that has now been built up. Figure 6 shows some of the changes that have been happening on dairy farms. A move to Total Mixed Ration feeding of dairy cows has become apparent with almost half of the dairy herds using benchmarking now using TMR in their herds. This compares to one quarter of herds 6 years ago. This has not automatically generated greater efficiency or higher profits for those that have followed this route (Figure 2). Alternative forage (either whole crop or forage maize) substitutes for at least some grass silage on one third of dairy farms. The number growing these crops appears to have levelled off with decoupling of Arable Aid Premiums likely to be having an impact. Some dairy farms appear not to be growing enough alternative forage to gain a response from their herds. Alternative forages have more of an impact on herd performance if they can be fed at 30% to 50% of the dry matter of the forage diet during the whole winter period. The average dairy farmer growing alternative forage grows 9.4 hectares for 127 cows. This is likely to provide around 0.8 tonnes of dry matter per cow during the winter on average (out of 1.8 – 2.2 tonnes of forage dry matter intake per cow during the winter).

Figure 6: Long term trends on benchmark farms



Herds yielding over 8,000 litres per year have also increased. Six years ago, only 3% of herds had an annual milk production per cow per year of over 8,000 litres. Now, this has risen to 16%. This level of milk can be taken as a "watershed" mark in terms of herd management. Individual cow daily milk yields peaking in excess of 40 litres becomes common place and creates an increased nutritional challenge on the production system to ensure adequate dry matter intakes to maintain cow fertility and welfare. It should be remembered that this is not a milk recorded 305-day yield. The benchmark yield is derived from the total milk produced (sold and used on the farm) divided by the average number of cows. It gives a better measure of economic performance in the dairy herd. In many cases, 305-day yields are quoted much higher than benchmark yields. This is due mainly to extended calving intervals.

What Are The Top 25% Of Farmers Doing Differently?

In recent years, the limiting factors on a dairy farm in Northern Ireland have moved away from milk quota to land and labour and thus effectively cows. The advent of the Nitrates Action Plan will continue this transition, as stocking rate will be capped on dairy farms. The best farmers must thus be measured on profit per cow rather than on profit per litre. Table 6 shows the tremendous range in profitability per cow between herds on benchmarking. The top 25% would be better off in a herd of 100 cows by just over 61,764 euros per annum. The key differences between the top and bottom groups accounting for this difference are as follows:

- Milk yield per cow is higher by 820 litre per cow
- Meal feeding only slightly lower by 163 kilos per cow
- Variable costs per cow lower by 79 euros per cow.
- Overheads lower by 184 euros per cow
- Milk quality and replacement rate are similar between the 2 groups
- Overall herd management and production efficiency

Dairy Profit Monitor Analysis

The Teagasc Profit Monitor programme is an internet based system which allows dairy farmers and their advisers to enter physical and financial data online on their farm enterprises. The system is available through the Teagasc client site on www.client.teagasc.ie.

Results from Teagasc Profit Monitors from 625 spring and 111 winter calving dairy were completed for the year ending March 2006. The data is analysed on a per litre basis ranked by net profit per litre. Slight discrepancies in the totals in some of the columns are due to rounding to the nearest decimal place.

Table 3: Summary of results for 625 Republic of Ireland spring calving farms. Family labour is not included in costs of production

	Average	**Top 10%**	**Bottom 10%**
	c/litre	**c/litre**	**c/litre**
Gross output	**27.34**	**29.11**	**25.79**
Variable costs	3.15	2.56	4.40
Feed	1.73	1.47	1.81
Fertiliser	0.90	0.77	1.10
Vet	0.46	0.42	0.49
AI	1.23	1.10	1.62
Contractor	1.40	1.14	1.85
Other variable costs	**8.87**	**7.46**	**11.26**
Total variable costs	**18.47**	**21.65**	**14.52**
Gross Margin			
Fixed Costs	0.70	0.49	1.22
bour	1.24	0.88	1.48
Machinery	1.19	0.97	1.34
Car/Electricity/Phone	1.62	1.27	2.14
Depreciation	0.88	0.75	1.17
Leases	2.45	1.72	3.15
Other fixed costs	**8.07**	**6.08**	**10.50**
tal fixed costs	**10.39**	**15.57**	**4.02**
Net Margin			

Table 4: Summary of results for 111 Republic of Ireland winter calving farms. Family labour is not included in costs of production

	Average	Top 20%	Bottom 20%
	c/litre	c/litre	c/litre
Gross output	**29.64**	**31.36**	**27.59**
Variable costs	4.13	3.33	4.87
Feed	1.45	1.39	1.41
Fertiliser	0.85	0.76	0.89
Vet	0.43	0.36	0.48
AI	1.12	1.05	1.16
Contractor	1.57	1.29	2.01
Other variable costs	**9.55**	**8.17**	**10.83**
Total variable costs	**20.09**	**23.19**	**16.76**
Gross Margin			
Fixed Costs	1.50	1.13	1.89
bour	1.81	1.22	2.24
Machinery	1.10	1.13	1.29
Car/ESB/Phone	1.71	1.40	2.38
Depreciation	1.05	0.96	1.14
Leases	2.63	1.94	3.72
Other fixed costs	**9.80**	**7.78**	**12.67**
tal fixed costs	**10.29**	**15.41**	**4.09**
Net Margin			

Dairy Farmers are not achieving the potential profitability gains at farm level. Considerable scope exists to increase profitability through improvements in on farm efficiency. Continued liberalisation of milk quota constraints will allow increased expansion opportunities for viable dairy producers in the future. The future competitiveness of dairy producers in a more liberal trading environment will depend upon their ability to minimise costs for a given level of output or to maximise output for a given level of input. The following paragraphs examine key components of profitability among a group of dairy farmers who have completed profit monitors.

Milk Receipts

Increasing milk receipts should be one of the target areas to increase dairy farm profitability. The data in Tables 3 and 4 shows large differences in Gross output. Gross output largely reflects the milk price but also includes sales of calves and culls minus the transfer of replacements into the herd. Milk price is influenced largely by milk composition payments. The gross output is also influenced by herd fertility. If cows don't go in calf, sales of calves are lower but also the cost of replacement is higher. Furthermore, the opportunity to sell surplus replacements is reduced.

Variable Costs

Variable costs should vary in approximately direct proportion to the level of milk production and include purchased feed, vet, AI, fertiliser and contractor costs. Consequently dairy farmers can most readily control these costs. Our research modellers have shown that there is strong relationship between the level of variable costs and net profit per litre. The higher the level of variable costs, the lower the level of profit.

Tables 3 and 4 show the average costs of production. In particular there is a huge variation in purchased feed cost irrespective of the system of milk production practiced. On average purchased feed accounts for 35% and 40% of the variable costs of spring milk and winter milk production systems respectively.

Generally higher levels of feed input are not reflected in the level of output per hectare. Therefore it can be concluded that excessive levels of feed were fed on these farms without a corresponding increase in output thereby reducing profitability.

Overhead Costs

These are the costs that by definition do not vary in proportion to the level of milk production (although in Table 2 it can be seen that they increase substantially with herd size). They include non-cash costs such as depreciation. While they are a cost in the system, overhead costs are not as strongly linked to profit as the variable cost in an Irish context. However the implementation of the Nitrate Directive Regulation will mean that these costs will increase in the years ahead.

Spring Versus Winter Milk Production

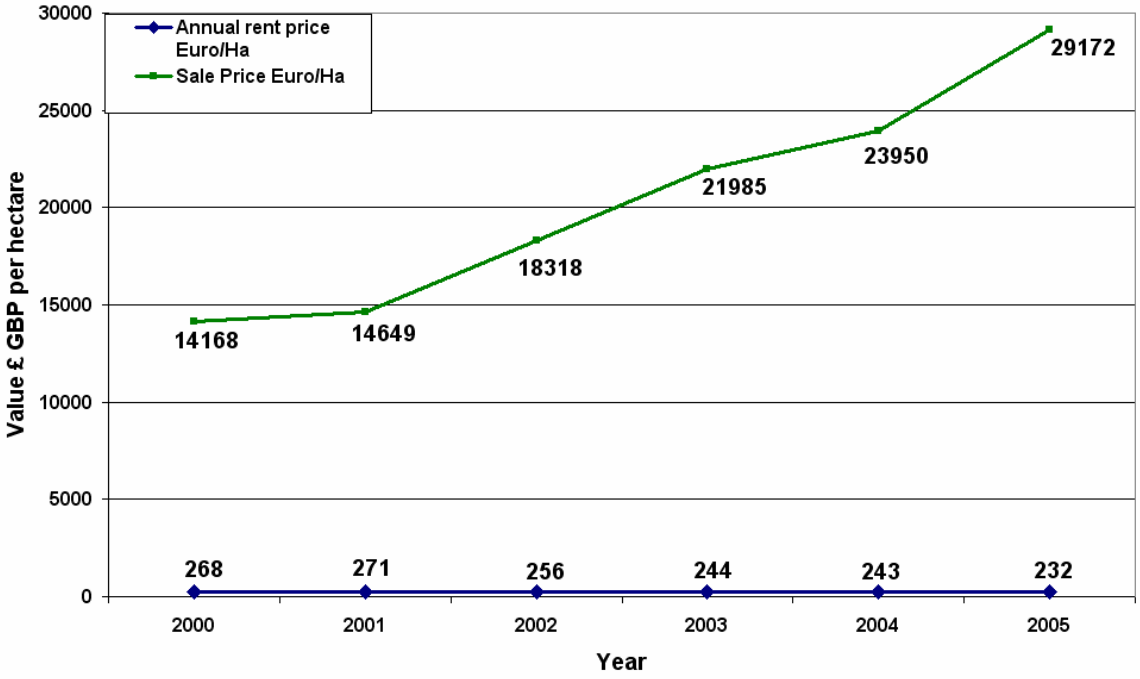
Essentially those farmers involved in spring milk production produce milk in line with the grass growth curve. Winter milk producers produce milk all year round. As a result feed costs are much higher but this is offset by higher winter bonuses in milk price. However machinery costs and labour costs are also higher. The bottom line however is that net profit per litre is the same. This has been the trend for many years. Even though the price received for milk is higher the costs of production, particularly feed costs erode this benefit.

Future Influences on the Cost of Milk Production in Ireland

Land Price

Land prices in Northern Ireland have always been among the highest in the UK. Normally, in the last few years, less than 1% of the agricultural land area is sold each year thus a low supply of land onto the market keeping prices up. Since 2002, house price inflation has commonly been in excess of 20% per annum. This has tended to feed into land prices through higher prices for development land and building sites. Also, UK inheritance tax rules mean that agricultural land is exempt from the tax. This has drawn external investment money into the land market. The result has been that purchase price for land has risen steadily as seen in Figure 7 while annual rent price has remained static. Anecdotal evidence suggests a continuation of this trend with some parcels of agricultural land changing hands in 2007 in excess of £70,000 per hectare.

Figure 7: Annual rent and purchase price for agricultural land in Northern Ireland 2000 – 2005 Euro/Ha



High land values have a number of influences of the economics of dairy farming. They push up the opportunity cost of owning land and thus the full economic cost of milk production (although the many owner occupiers do not see any change in their cashflow or profit as a result). High land prices also offer the alternative of ceasing milk production and selling land to release the large amount of capital tied up in a dairy business. Developing farm businesses find it almost impossible to purchase land for expansion. Many of the larger dairy businesses in the country are renting substantial areas of land to supplement relatively small owned areas. Approximately one third of the land area is rented out on an annual basis.

Single Farm Payment

Full decoupling of the EU Dairy Premium occurred in Ireland on the 1st January 2005. Dairy farmers Ireland thus receive a decoupled payment each year. This does not influence the cost of milk production but many dairy farmers have used it to subsidise their business in periods of poor milk price as in 2006 (see Figure 3). The future of this payment will affect the number of dairy farmers remaining in the industry. It is seen by some as a guaranteed income after stopping milk production and thus could be seen as both an indirect subsidy to those in milk production and a route for some to exit the industry.

Nitrates Directive

Northern Ireland and the Republic of Ireland have recently implemented the Nitrates Action Programme. A requirement for a specific number of weeks slurry capacity (varies depending on location) will add costs to a number of dairy farms (although capital grant aid is available towards the cost of storage in both jurisdictions). Many dairy farmers will also have additional land rental charges in order to meet the limit of manure nitrogen per hectare (this is also dependant on the EU granting a derogation to 250kg/Ha in Northern Ireland. A derogation is already available to farmers in the Republic of Ireland).

In summary, milk production in Northern Ireland is competitive within the UK as evidenced by the migration of milk quota to the region since 1994. In terms of "cash costs", milk can be produced at a lower cost than many other countries. Full economic costs are likely to be higher than other countries

given the high wage rates in the country and exceptionally high land values. Cost inflation in the future will certainly threaten many of the competitive advantages that Northern Ireland from being a good area for growing and grazing grass.

Dairy farmers in the Republic of Ireland are very exposed to influences of international decisions such as W.T.O., continuing EU agricultural policy reform, the Nitrate Directive and further environmental legislation, international production and demand for dairy produce. This due to the fact that Ireland is largely an exporting country of agricultural products. However, the medium to long term outlook for milk markets are good; supply is growing at around 1% and demand is growing at 1.5 to 2%. While the world economy remains strong, and China in particular continues to grow, then the outlook is favourable.

New Zealand and Australia have 20% more of the world trade market now than they had 15 years ago; but growth in production has slowed down. The US increased milk production last year by 4% - which is a concern. This was drive by high milk prices in 2004 and 2005. South America is the continent of greatest potential, but probably lacks the necessary skills to expand production significantly in the medium term. Because of worldwide demand for grain and recent changes in Europe, grain price are likely to increase. This will favour low cost grass based systems of dairying, with lower meal and labour demands.

NON-ADOPTION OF CONSERVATION TILLAGE BECAUSE OF KNOWLEDGE GAPS? - A CASE STUDY FROM NORTH-EAST BULGARIA -

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Abstract

If applied properly conservation tillage is a technology which can increase farms economic situation through reducing energy input and saving time for operations and on the other hand is beneficial for the environment and plant growing through reducing the risk of erosion and preserving soil moisture. Adoption of a conservation tillage systems not only means having the appropriate machinery (e.g. disc harrows or harrows), but also the respective abilities and knowledge of how to use the machinery to serve the farmer's objectives. Several studies have investigated the impact of human capital on technology adoption in agriculture, for example, by considering variables such as schooling, age, and contact to extension agents. However, in the decision making process a farmer's perception of characteristics of a new technology such as its relative advantage, compatibility and complexity forms the persuasion of an individual to adopt or to reject an innovation. For the most, studies on technology adoption have been carried out for developing countries and the American continent. However, up to now there has been hardly any research on the adoption of agricultural technology in transition countries. This is surprising as one could have expected changes in farmers' adoption behaviour since the start of transition. In this paper we investigate farmers' perceptions and attitudes towards the adoption and use of conservation tillage systems in North-East Bulgaria. In particular, we study whether information deficits and knowledge gaps about the use of conservation tillage systems determine the farmers' perceptions and attitudes. We base our analysis on a case study involving interviews with 35 farm managers in the region. Results suggest that knowledge gaps and information deficits determine the adequate use of conservation tillage practices. Although farms have some machinery which can be used for conservation tillage practices (e.g. harrows), results suggest that farms do so very selectively. Farms perceive the technology as being appropriate only for a limited range of crops (e.g. cereals). For all other crops (including maize) it is not considered as a proper tillage system. Farmers' attitudes towards conservation tillage appears to contradict reasons accredited to conservation tillage in literature. Approved advantages of conservation tillage, for example the preservation of soil moisture are not connected by farmers with this system and perceived to be better in the conventional tillage system.

Keywords: conservation tillage, technology adoption, Bulgaria

Introduction

After 1990 like in many other transition countries, the agricultural sector in Bulgaria was privatized. Due to the uncertain situation in other sectors many people started with farming although they did not have any or only little knowledge about agriculture. Nowadays, farmers have to face more and more management tasks to ensure the economic surviving of their farm. Hence, they have to minimise costs wherever possible or increase the profitability of the production system. This is particularly relevant for

market-oriented arable farms which are producing and thus competing on the world market. In Bulgaria the majority of these farms is located in the North-East. This region is characterised by continental climate with low rainfall, forcing farmers to use the humidity as efficiently as possible and adopting to sensitive natural production conditions.

One way to face these challenges (reducing costs, managing efficiently moisture, etc.) on arable farms could be the adoption of minimum soil tillage systems (e.g. UNGER 1990, IRVINE et al. 2003 and CARTER 1994). This technology has widely been adopted in other countries in closer proximity to Bulgaria, e.g. Ukraine (KASSA 2006) and Hungary (ECAF 2007), but no studies for Bulgaria itself have been found.

This paper aims to discuss possible reasons for the adoption and non-adoption of conservation tillage (CT) on arable farms in North-East Bulgaria. The results are based on several expert interviews and a farm survey[1]. The expert interviews were conducted with 16 different stakeholders from the highest level of policy, science and industry in the preface in Sofia. The farm survey incorporates 48 arable farms in North-East Bulgaria. Results suggest that a lack of knowledge about the technology, its characteristics and use among farmers provide an explanation for non-adoption.

Conservation Tillage in Eastern Europe

Up to now there are only few studies available which deal with conservation tillage in Eastern Europe. Information about use is also rather few. For example, the European Conservation Agriculture Federation (ECAF) gives some data to the use of conservation tillage in Europe. As the only Eastern European countries Hungary and Slovakia are mentioned with 500.000 ha (representing 10% of the agricultural area) respectively 140.000 ha (representing also 10%) under the use of conservation tillage. The "Knowledge assessment and sharing on sustainable agriculture" (KASSA) –project investigated conservation agriculture practices in Europe. From the Eastern part of Europe Ukraine and Czech Republic were taken as case studies. The highest proportion of conservation tillage on the whole tillage among the investigated countries has been found in Ukraine with 24%, but also Czech Republic ranks with 18% on the top of the European countries. But these studies have been exceptions; most of the available literature is from the early 1990s or before and have not considered the developments and challenges of the future e.g. the accession of European countries. BUTORAC 1994, for example predicts that "conservation tillage will at least partially play the same role in the future that the plough had played in the past". He also outlined that the adoption of CT will not only be influenced by natural conditions but to a significant stake by social factors and tradition.

For Bulgaria there is no further reading available. Several studies, especially from the Pushkarov Institute of Soil sciences in Sofia, address Bulgaria's soils and erosion. Hence, erosion is one of the major reasons why CT is supported because of its ability to reduce wind and water erosion up to 90% (HOLLAND 2004), but these studies mainly deal with the influences on soil properties and the extend of erosion (KROUMOV and DOCHEV 2002), although their recommendation is to use more conservation tillage. In this context the North-East of Bulgaria was mentioned as one of Bulgaria's regions with severe wind erosion is occurring.

Expert interviews displayed the state of the art in conservation tillage where it's use tends to be rather low. The benefits of CT for the environment were described as neglectable and the only reason why experts could imagine to use CT was because of economics.

[1] We are thankful to Bozidar Ivanov for his assistance in carrying out the interviews.

Research Hypothesis

Keeping this in mind, with the available data we investigate the following hypothesis:
In the expert interviews (JUNGKLAUS and HAPPE 2007) it was already stated that Bulgarian farmers are not using conservation tillage because of environmental reasons. Also TEBRÜGGE and BÖHRENSEN (2001) found out that farmers in Europe as well as in USA are only motivated because of economic reasons. So our first hypothesis is

(1) Saving costs is the main reason for farmers to use CT.

Of course, obstacles exist in using the technology. Derived from literature (e.g. RUSU et al. 2006 and HOLLAND 2004) which mentions an efficient management of plant antagonists as one of the biggest obstacles of CT, we formulate the hypothesis

(2) Farmers consider higher pressure of weeds and diseases as the main obstacle for using CT.

TEBRÜGGE and BÖHRENSEN (2001) identified that farmers perceive the advantages different from the way conservation tillage is promoted (e.g. HALVORSEN et al. 2002 and PANELL et al. 2005). Finally, based on the results from expert interviews on conservation tillage in Bulgaria it appears that the understanding and the knowledge about CT itself and its properties does not seem to be widely distributed among farmers. So we estimate that

(3) There are knowledge gaps about conservation tillage.

Within our farm survey we are testing these hypotheses with some different questions.

Methodology and Data

In July 2006 we conducted interviews with 16 experts in Sofia (JUNGKLAUS and HAPPE 2007). The experts were from the highest level of policy, science, producing industry and consultancy. With the help of a predefined questionnaire consisting of open ended questions experts were asked about their opinions with respect to conservation tillage. They should describe from their point of view the extend (how much CT is used in Bulgaria) and obstacles as well as reasons why farmers adopt or reject the technology. However, the outcome of these expert interviews have been mixed up and no clear picture regarding the use and reasons for adoption and rejection of CT could be derived. But responses of the some experts indicate that there is a lack of knowledge to use conservation tillage properly. In addition, we conducted a farm survey in the North-East of Bulgaria with an extensive questionnaire. Farms were chosen based on the criterion of production range and size in North-East Bulgaria. The focus is on farms with arable production, since for other farms, e.g. with perennials and fruits and vegetables CT is of less interest. The farm size matters in that effect that smaller farms are more restricted to use CT effectively. So we set up the minimum farm size to 50 ha land area.

In the survey 47 different farms had been interviewed. As apparent from table 1 farms with different organisation forms had been queried. The average farm size of 1450 ha is high. However, it differs between different organisational forms with private farms (average of 468 ha) being the smallest producers. Contrary, the legal forms limited and stock companies are the biggest producers with 1989 ha resp. 1639 ha on average, but also cooperatives persist with big land area (1679 ha on average). Overall, these 47 farms account for a total agricultural land area of almost 70.000 ha.

Table 1: Structure and organisation form of interviewed farms

Organisation of farm			Average farm area	Conservation tillage		
	Number	%		Full user	Partial user	Non-user
Private farm	8	17,02	468	1	6	1
Cooperative	11	23,40	1670	0	11	0
Limited company	9	19,15	1989	0	9	0
Joint stock company	11	23,40	1639	0	7	4
Other	2	4,26	950	0	1	1
Tenant	6	12,77	1531	0	3	3
Total	47	100	1450	1	37	9

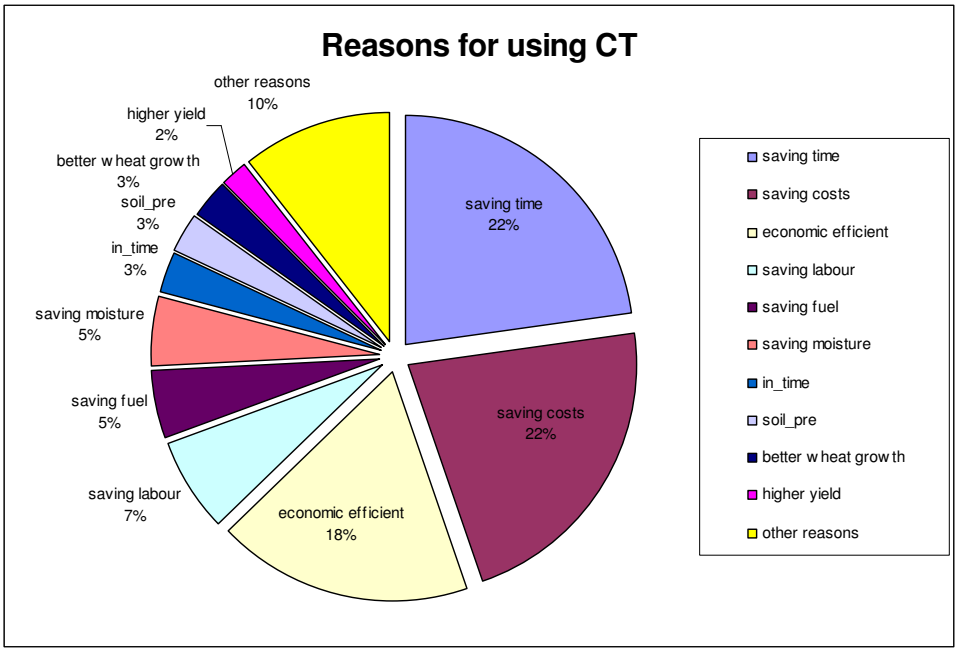
As shown in table 1, only one farmer was using conservation tillage (in that case direct seeding) on the whole farm, while the majority (79%) used it at least on a small amount of the farm. Only nine farmers did not use any conservation tillage.

Results

The farm managers were directly asked to state their reasons for using or not using conservation tillage respectively for not using it to a greater extend. The questions were open ended, but limited to three statements per question. However, during the interviews this often did not suffice and respondents mentioned much more reasons. In that case farmers were asked to give the three most important reasons from their point of view.

Use of Conservation Tillage

As 38 farms are using conservation tillage at least to a little extend we got 103 statements why they are using CT. From the results we could clearly derive that using conservation tillage is mainly done because of economic effects (see figure 1).



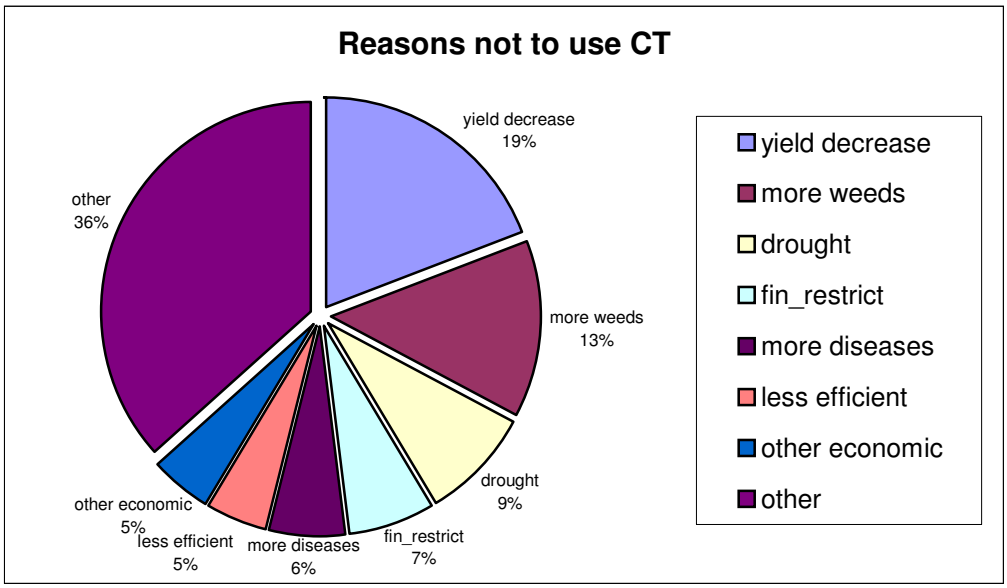
Overall, it was used because of saving certain resources from the economic point of view. “Saving costs”, “saving time” and the comparatively higher “economic efficiency” together with less often termed “saving labour” (7%) and “saving fuel” (5%) accounted for almost ¾ (74%) of all statements. With “saving moisture” the first argument with an agronomic background rather than an economic was addressed, but it was only stated by 5 farmers.

Similarly, other agronomic reasons were found rarely which are related to the production system. Only three farmers mentioned “better wheat growing conditions” and a much more favourable “soil preparation”. Two farmers even accredited higher wheat yields to the conservation tillage system. However, there are some other arguments which are quantitatively not relevant, but show some interesting motivation why farmers use it. For example, only one farmer is using it because she was thinking that it is a far better “ecological” tillage system and that farmers should have a responsibility towards nature. Another farmer deemed the climatic conditions in the region with low rainfall and high temperatures in summer as convenient for the use of conservation tillage. The climatic conditions were mentioned by another farmer as well but he favoured CT, because in his opinion deep ploughing increases the danger of frost losses in his opinion. However, we had expected more farmers attesting the climate conditions as favourable for the use of CT.

Non-Use or Non Extension of Conservation Tillage

Subsequently, the nine farmers who are not using conservation tillage were asked why they are not using it and the 37 partial users of CT were asked why they are not extending their use. The only full-user was excluded from this issue. As statements did not show any differences regarding the groups (non-user and partial user) we combined them in figure 2. Altogether we got 99 statements. Expected statements which veer towards certain crops in the crop rotation making ploughing necessary or capacities are too limited did not occur.

Figure 2: Reasons why farmers are not using or not extending conservation tillage



Unsurprisingly, like in other studies which examined the adoption factors of conservation tillage (e.g. CLEARFIELD and OSGOOD 1986 and CARTER 1994), farmers in the survey were significantly influenced by the fear that yields will decrease and furthermore weeds and diseases will spread. That yields will go down was one of the main reason (19%) for farmers not to use respectively extend conservation tillage on their land. The other important reason was that weeds and diseases (together 19%)

will spread much more than with ploughing and thus expenses for plant protection treatments will rise. More surprising was that 9% of the respondents stated that they will not extend or that they are not using CT because of drought. For this group ploughing is the better system to preserve the soil moisture. Limited financial resources to buy and implement machinery for conservation tillage were stated by 7% of the questioned farmers.

For the question why farmers are not using CT we got many different statements which were given just by one or two farmers. However, four farmers attested CT not to be applicable on the soils in the region. Furthermore, it evolved that CT is not suitable for crop rotation with only wheat and maize, that the vegetation is too bad for usage and that organic material is not buried enough in and thus make later operations more difficult. Some statements even show some new aspects of CT which have to be questioned against the background of the known literature. For example, this tillage should not be applicable in the region because the mixing of soil is not sufficient and thus phosphate mineralisation is worse than with the plough. Another was referring to the machinery which should not fit to the Bulgarian conditions. Finally, one farmer said that he would use CT if there just would be some state support.

Discussion and Conclusion

Farmers in the North-East of Bulgaria used conservation tillage mainly because of economic reasons. Contrary, some of them are not using it or do not want to extend the use on their farm because of decreasing yields and increasing pressure from weeds and diseases.

Saving costs and saving time were the most mentioned statements to use conservation tillage. As a third strong statement farmers announced that CT is from the economic point of view more efficient than the conventional system. This results seem to correspondent strongly with findings in other studies, TEBRÜGGE and BÖHRENSEN (2001), CARTER (1994) and ZENTER et al. 2002. This provides some evidence that or first hypothesis *"saving costs is the main reason for farmers to use CT"* applies in Bulgaria's North-East. Improvements in plant production respectively plant growth are an also-ran and were considered by less than 5% of the respondents.

More interesting was the question why farmers are not using CT. A possible decrease in yield and the challenge to face a higher weed and disease pressure are obstacles farmers have to cope with (e.g. LANKOSKI 2006 and TEBRÜGGE 2002). But anyway the system can be economic advantageous if the decrease in costs (see statements in figure 1) is higher than increase in input factors (chemicals) and the decrease in yields (LANKOSKI 2006). The farmers in the survey also reported the increase of weeds and diseases as a major obstacle connected with the use of CT. Thus we can find some evidence for our second hypothesis *"farmers consider higher pressure of weeds and diseases as the main obstacle for using CT"*. But for farmers more weeds are not necessarily connected with more diseases and so some mentioned only on of these two statements. So the weeds are considered by the farmers a little more restrictive to the use of CT, than diseases. Together they are as important as the other main argument not to use CT, the decrease in yields.

The question why farmers are not using or not extending the use of CT delivered some surprising statements which seem to contradict strongly with some results found in literature.

1. Already in the expert interviews a high share of experts stated that the soil in North-East Bulgaria was too heavy to implement CT successfully. Soil analyses show that especially on the locations of the interviewed farms the predominant soil type is ordinary chernozem (BULGARIA SOIL AGENCY 2006). Yet, this particular soil type was (in almost similar conditions) under investigation in a study by ZENTER et al. (2002) and valued as suitable for CT. Even on the "other side of the Danube" in Romania trials like described in GANGU et al. (1999) and in

NISTOR and NISTOR (2002) came to different results. Furthermore, farmers who used CT to a greater extend did not agree with this argument.

A possible explanation was given by some farmers who showed an internal study about for cooperatives in 1984. Results indicated that the present machinery - which had been from western producers at that time - was too fragile and not well adapted to the comparatively higher requirements on machinery (larger working capacity, higher pulling power, etc.) in Bulgaria's cooperatives with agricultural land of some 1000 ha.

2. Too little rainfall, respectively drought, was also a reason for some farmers not to use CT. The rainfall in North-East Bulgaria is around 400 to 450 mm/a. These are more or less the same conditions UNGER (1990) describes in his report where he compared CT with the conventional system and highlighted advantages of CT. Furthermore, a number of studies, e.g. CLEARFIELD and OSGOOD (1986), HALVORSEN et. al. (2002) and IRVINE et al. (2003) suggest the use of CT because of little rainfall.

3. One farmer believed that under CT the rain permeation into soil is much lower. Others perceived the plough as the better tillage system to preserve the soil moisture. Studies like UNGER (1990) and HOLLAND (2004) oppose this opinion. Following them the lower operation depth and the hindering of furrow compaction provides better soil pore system and thus a more permeable environment for occurring rainfall.

4. HOLLAND (2004) describes some effects CT has on the environment like improvement on soil structure that should be also desired by farmers. None of the respondents gave any of these arguments. Based on this one can carefully follow that environmental impacts may not be important or farmers are not aware of them.

These findings may give us some evidence that some farmers have not a very in depth knowledge about CT and thus our third hypothesis *"there are knowledge gaps about conservation tillage"* applies also for (some) farms in North-East Bulgaria. Farmers use CT mainly because of economic advantages. Environmental concerns and tackling unfavourable natural production conditions appear not to influence decision making. Yet, it appears that many of the interviewed farmers are not aware of the characteristics of CT.

Summarising the results, we find that Bulgarian farmers have indeed the feeling that they are using CT because of its potential for saving costs and time. Obstacles can be found in the concerns that yield is going down and the pressure caused by weeds and diseases is increasing. An interesting finding was that the third most mentioned constraint for the use of CT was the belief, that the climate is too dry and that these are unfavourable conditions for the application of CT. In a lot of other cases the dry climate and the demand for conserving soil moisture had been the motivation to establish conservation tillage.

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EFFECTS OF AUTOMATIC MILKING AND CONVENTIONAL MILKING ON THE PROFITABILITY OF DUTCH DAIRY FARMS

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Abstract

The objective of this study was to analyze the profitability of dairy farms using an automatic milking system (AMS) compared with a conventional milking system (CMS) based on real accounting data. In total, 62 farms (31 AMS and 31 CMS) were analyzed for the year 2003, using a case control study. Results of 2003 showed that AMS farms used on average 29% less labor and had € 7,899 lower revenues. CMS farms had € 15,566 more available for rent, depreciation, interest, labour and profit (RDILP) than AMS farms. AMS farms had greater revenues, margin, and gross margin per full time employee, resulting in a substantial (but not statistical significant) greater RDILP per full time employee. Costs for depreciation and interest were larger for AMS farms than for CMS farms. Therefore, farm managers should consider the extra time acquired by automatic milking against extra costs associated with an AMS.

Key words: automatic milking, labour productivity, economics, profitability

Introduction

The first automatic milking systems (**AMS**) in the Netherlands were installed in 1992. The primary goal was to replace labor. In 2004, worldwide more than 2,200 farms were using an AMS (de Koning and Rodenburg, 2004). A survey in 2006 reported a total number of 4000, an increase of 25% with reference to 2005 (De Koning, 2006). Economic benefits of automatic milking are mainly savings in labor and increased of production per cow (Wade et al., 2004).

Reported labor savings by using an AMS differed from 18 % (Mathijs, 2004) to 38% (Sonck, 1995). Wirtz et al. (2004) reported that the milk production could increase up to 20%, whereas Wade et al. (2004) only found an average increase of 2% after the introduction of an AMS.

Several studies have been published on economic consequences of automatic milking (Arendzen and van Scheppingen, 2000; Hyde and Engel, 2002; Rotz et al., 2003). With some exceptions, the general trend in these studies was that automatic milking has negative effects on the economic performance of the farm when compared with conventional milking.

Economic studies conducted to date were based on normative models, where the advantages of automatic milking (labor savings and increased production) were compared with increased costs (depreciation, maintenance, and interest). A study on the economic aspects of automatic milking based on actual farm data is still lacking.

Therefore, the objective of this study was to analyze the profitability of the dairy farms with an AMS in comparison with farms using a CMS based on actual farm data.

Materials and Methods

Data

Data for this study originated from a Dutch accounting agency (Alfa accountants en Advisors, Wageningen, The Netherlands), one of the largest agricultural bookkeeping agencies in the Netherlands with customers throughout the whole country.

A database of 1,400 dairy farms was available for this research. Because not all data for 2004 were yet available, 2003 was used as the year of comparison. From this database, 31 farms with an AMS were selected.

A case control method was used in this study. Each farm with an AMS was matched to a farm that invested in a new CMS during the same year, selected from the same database. Matching was based on year of investment, the total milk production per year (maximum difference of 10%), and intensity of land use (defined as milk production per ha with a maximum difference of 1,000 kg/ha**).** This resulted in a total of 31 farms with an AMS (referred to as AMS31) and 31 farms with a CMS (referred to as CMS31) used in the study. On these 31 farms, 55 milking units were in use, an average of 1.77 milking units per farm.

Technical, financial and farm structure data of the 62 farms (AMS31 and CMS31) were available for the year 2003. In total, 244 variables were analyzed in this study. The most important variables are presented in this article.

The economic results of the two groups in absolute amounts were shown to give an indication about the total profitability. Besides these absolute economic figures, the economic results were also expressed per 100 kg of energy-corrected milk (**ECM**) to reflect the performance relative to the farm size. The ECM is used, because in the Netherlands the milk price is based on kilograms of fat and protein. The ECM is calculated as follows (Hemmer et al., 2004):

$$ECM = (0.337 + (0.116 \times \%F) + (0.06 \times \%P)) \times M,$$

Where M = true milk yield in kg; %F = fat percentage; and %P = protein percentage.

The farms were financially compared based on the amount of money that was available for rent, depreciation, interest, labor and profit (RDILP). The RDILP was calculated as gross margin minus the total non-accountable costs (excluding labor). Rent, depreciation, interest and labor are regarded as fixed costs, and therefore, are excluded when judging the performance of the farm. Larger purchase costs and shorter depreciation time of the AMS would have negative impact on financial outcomes of AMS farms. Therefore, the RDILP should be a good indicator of the dairy farm performance. Depreciation and interest costs, however, differ between milking systems and are important for economic performance. Available bookkeeping data were meant for fiscal use. Resulting estimates for depreciation and interest could therefore not be used for a business economic purpose. Therefore, per farm, depreciation and interest for milking equipment were calculated normatively (based on assumptions). For an AMS farm, number of milking units of that farm was multiplied with the purchase costs of 1 AMS unit. Purchase costs of 1 AMS unit (including building costs) were assumed to be €100,000. For a CMS farm, the investment in a milking parlor, including building costs, were estimated using the following function:

$Y_i = 65{,}500 * \log_e (X_i) - 225{,}000$
where, Y_i denotes the total costs (including building costs) of a milking parlor for farm i and X_i denotes the herd size of farm i, with $40 < X_i < 200$.

The used, logarithmical, function gives credit to the decreasing marginal costs (€ per milking cow) of a milking parlor for increasing herd sizes. For an AMS and a CMS, a salvage value of 10 and 5%, respectively, of the purchase value were assumed. Economic life time was assumed to be 10 and 15 yr, respectively, for an AMS and a CMS. An interest rate of 5 % was used.

Data Analysis

A descriptive analysis was carried out by using SPSS 13.0 for Windows (SPSS, 2005). For all variables, the standard deviation of the mean was larger than 50%, from which was concluded that none of the variables were normally distributed. To test the null-hypothesis of no difference between AMS and CMS farms, a non-parametric test of 2 related samples, the 2-tailed Wilcoxon test, was used (Field, 2000). AMS31 and CMS31 were analyzed for the year 2003.

Results And Discussion

Study Design

Year of investment in a milking system for a CMS farm was similar to that of the comparable AMS farm. Total milk quota and land use did not differ between AMS and CMS farms (table 1). Average milk quota of the farms, however, was larger (almost 400,000 kg of milk) than the average milk production (442,904 kg of milk per farm) in The Netherlands (CBS, 2003). These data indicate that farms investing in an AMS are not average farms.

Table 1. Average structure of 31 farms using an automatic milking system (AMS31) and 31 farms using a conventional milking system (CMS31) in 2003

Item	AMS31	CMS31	*P*
Total land use, ha	60.0	61.7	0.906
Pasture, ha	44.29	48.96	0.170
Milk quota, kg	828,761	853,620	0.196
No. of dairy cows	105	110	0.681
Total labor FTE[1]	1.45	1.87	0.001
Entrepreneurial labor FTE	1.07	1.62	0.001
Family member labor FTE	0.19	0.07	0.024
Employee labor FTE	0.19	0.18	0.737
Dairy cows/family FTE[2]	85	65	0.001
Milk/family FTE, kg	674,642	508,017	0.001
ECM[3]/family FTE, kg	703,702	534,681	0.001
Dairy cows/total FTE	74	59	0.001
Milk/total FTE, kg	586,241	459,117	0.001
ECM/total FTE, kg	611,493	483,215	0.001
Milk/cow, kg	8,011	7,894	0.845
ECM/cow, kg	8,361	8,298	0.938

[1]FTE=Full time employee = 2540 h of work.
[2]Family FTE is the sum of entrepreneurial and family member FTE.
[3]ECM = Fat- and protein-corrected milk.

We examined performance of the farms after investment. Because the data of the accounting agency were only available for the most recent years a "before and after" analysis was not possible. By using a case control design, differences between farms were made as small as possible. Therefore, farms were comparable and results would be useful. Selection of data was done very strictly. It was, however, more important to have correct matching data instead of a larger number of farms.

Structure of Farms

Table 1 shows the structure of the farms used in the study. Total amount of labor, expressed as full time employee (**FTE**) equivalents, was smaller ($P < 0.001$) on AMS31 than on CMS31. Gustafsson (2004) found a 19% saving of labor when using an AMS. In our study, AMS31 used on average 29% labor less ($P < 0.001$) labor than CMS31. Labor costs for external workers were expected to be smaller for AMS31 because less labor should be needed. In our study, however, use of external workers was almost equal between the groups. This was also shown by the costs for external workers: AMS31 was €7,982 and CMS31 was €8,438. On average, 1,067 more ($P < 0.001$) hours of labor (approximately 20 h/wk) were required on CMS31 than on AMS31. A hard working family on a farm can compensate for this by working longer hours each day.

The range of the entrepreneurial FTE for AMS31 (0.5 to 1.6) indicates that the majority of AMS farms were run by a single family, whereas the range for CMS31 (1.0 to 2.5) indicates that some of the CMS31 farms were run by more than 1 family. This means that farm income must be divided. Because this information was not available, this can only be assumed.

As a consequence of the less labor use, efficiency of AMS31 was better. On farms with an AMS more ($P < 0.001$) cows were held and more ($P < 0.001$) milk was produced by a single FTE, both for total FTE and for family FTE. Although more cows per FTE were held on the AMS farms than on the CMS farms, average milk production per robot was 494,442 kg of milk. The capacity of 1 robot lies approximately between 600,000 and 750,000 kg of milk/yr (De Koning and Ouweltjes, 2000). Dairy farms in our study, however, were on average not utilizing the full capacity of the milking units. This indicates that there is space to grow within the existing capacity of the AMS.

Economic Results

Descriptive Overview

Table 2 shows the averages and the 5 and 95 percentiles of revenues, costs, margins, non-accountable costs, and RDILP. Calculation methods also are shown in this table. Differences between the systems are discussed later.

Table 2. Average, 5, and 95 percentiles of revenues, costs, margins, non-accountable costs and RDILP[1] (all in Euros) for 31 farms having an automatic milking system (AMS31) and 31 farms using a conventional milking system (CMS31) in 2003

	AMS31			CMS31		
	Average	5%	95%	Average	5%	95%
Revenues						
Milk	274,556	145,863	445,676	287,333	149,436	422,934
Payment milk quota surplus	-1,013	-6,011	0	-808	-2,372	43
Milk quality penalties	-45	0	0	-52	-24	61
Livestock	18,243	5,548	29,865	17,629	-3,131	36,966
Miscellaneous	7,506	133	21,531	3,046	0	14,782
Total (a)	299,248	170,300	455,178	307,147	172,287	456,512
Feed costs						
Concentrates	40,718	20,316	68,686	44,057	22,152	71,548
Substitutes for concentrates	5,519	0	10,631	6,734	0	21,045
Roughage	3,414	-3,863	11,223	3,081	-10,099	14,570
Milk products	1,651	0	3,600	1,838	0	6,569
Other feed	2,901	201	7,220	1,410	114	4,185
Total (b)	54,202	27,067	87,178	57,120	28,803	102,021
Livestock costs						
Health	4,526	1,311	10,937	5,135	1,548	11,245
Medicines	3,036	0	7,932	3,078	0	8,542
AI and breeding	5,136	561	12,034	7,871	3,318	20,415
Miscellaneous	5,508	1,460	12,480	4,474	953	7,921
Total (c)	18,205	6,460	32,230	20,559	8,742	36,804
Costs of land use						
Fertilizer	7,443	2,462	13,711	7,048	3,130	12,410
Seed	1,991	0	6,595	3,699	336	9,465
Pesticide	1,169	0	4,779	1,810	0	4,776
Miscellaneous	794	0	1,768	391	0	1,040
Total (d)	11,396	4,497	24,969	12,948	4,476	27,379
Total costs (b + c + d) (e)	83,804	40,249	131,645	90,626	47,982	152,808
Margins						
Margin on dairy (a – e)	215,444	118,937	337,370	216,521	124,513	321,746
Margin other farm activities	3,286	0	14,638	2,651	-1,200	14,866
Other activities	12,813	0	41,302	13,347	779	37,173
Gross margin (f)	231,542	123,731	364,341	232,519	127,639	336,610
Non-accountable costs						
Contractor	21,783	5,653	44862	15,361	3,369	28,597
Maintenance/insurance of:						
- machinery and equipment	28,088	10,705	52,718	24,411	8,172	48,126
- land, buildings, installations	7,404	1,329	15,546	5,371	-748	14,594
Gas, water and electricity	10,337	4,482	17,052	8,788	4,853	13,449
Other non-accountable costs	12,002	6,395	17,883	11,093	6,561	16,044
Total (g)	79,614	42,934	125,890	65,025	29,829	102,327
Available for RDILP (f – g)	151,928	80,073	262,962	167,494	82,627	249,811

[1]Rent, depreciation, interest, labor, and profit.

Dairy Production

Table 3 shows milk production of AMS and CMS farms. Protein percentage was greater ($P < 0.02$) for farms using a CMS. The ECM tended ($P = 0.065$) to be larger for the farms using a CMS. In Table 4, revenues, costs, and margins are given for the whole farm and expressed per 100 kg of ECM. In The Netherlands, production capacity is made up by the milk quota. Milk payments are based upon the delivered amount of fat and protein. Economic performance per 100 kg of ECM is therefore important.

Table 3. Average milk production, fat percentage, protein percentage and energy-corrected milk (ECM) of 31 farms having an automatic milking system (AMS) and 31 farms using a conventional milking system (CMS) in 2003

	AMS31	CMS31	*P*
Milk production, kg/farm	836,095	847,057	0.203
Fat, %	4.33	4.37	0.264
Protein, %	3.42	3.47	0.017
ECM, kg/farm	870,585	891,057	0.065

A difference was shown in milk revenues (Table 4), both absolute ($P = 0.003$) and per 100 kg of ECM ($P = 0.002$), between AMS and CMS farms. Milk price was the same for the 2 farm types, but because of larger protein and fat percentages, corrected milk price was larger ($P = 0.002$) for CMS31. This difference, however, was not expressed in the total revenues, because of numerically larger miscellaneous revenues of AMS31. No difference was detected in costs. The margin on dairy production per 100 kg of ECM was nearly identical.

Table 4. Average revenues, costs and margin on dairy in Euros, absolute and per 100 kg of energy-corrected milk (ECM) of 31 farms having an automatic milking system (AMS) and 31 farms using a conventional milking system (CMS) in 2003

	Absolute			100 kg of ECM		
	AMS31	CMS31	*P*	AMS31	CMS31	*P*
Milk revenues	274,556	287,333	0.003	31.53	32.27	0.002
Miscellaneous revenues	24,692	19,815	0.583	2.82	2.27	0.232
Total revenues	299,248	307,147	0.112	34.35	34.54	0.544
Concentrate costs	40,718	44,057	0.357	4.67	4.83	0.481
Total feed costs	54,202	57,120	0.290	6.47	6.33	0.845
Health costs	7,561	8,213	0.597	0.84	0.93	0.681
Total livestock costs	18,205	20,559	0.468	2.01	2.25	0.531
Land use costs	11,396	12,948	0.224	1.28	1.46	0.170
Total costs	83,804	90,626	0.164	9.76	10.04	0.505
Margin dairy production	215,444	216,521	0.597	24.60	24.50	0.953

Profitability

Costs for contractors and costs for gas, water, and electricity were greater ($P < 0.05$) for farms with an AMS than for those using a CMS (Table 5). Larger contractor costs of an AMS farm might be explained by a different feeding strategy on these farms. The 29% lesser requirement of labor on AMS farms (Table 1) might not necessarily only be caused by a reduced amount of labor for milking, but also could be caused by increased use of contractors. The net result (profit) of a farm is used many times in comparisons. Considering that the net result is dependent on the financial structure of a specific farm,

comparing on this basis might, therefore, actually be merely a comparison of farm structure and not of farm management. The RDILP is, therefore, a good measure to estimate the overall profitability independent of farm structure. The RDILP represents the benefits and those cost factors that are not necessarily expenses. The RDILP was larger ($P < 0.05$) by €15,566 for CMS31 farms, caused by the smaller non-accountable costs of CMS31. The same results were found per 100 kg of ECM.

Table 5. Average gross margin, non-accountable costs and available for RDILP[1] in Euros, absolute and per 100 kg of energy-corrected milk (ECM) of 31farms with an automatic milking system (AMS) and 31 farms with a conventional milking system (CMS) in 2003

	Absolute			100 kg of ECM		
	AMS31	CMS31	*P*	AMS31	CMS31	*P*
Margin dairy production	215,444	216,521	0.597	24.60	24.50	0.953
Gross margin	231,542	232,519	0.754	26.51	26.34	0.938
Contractor	21,783	15,361	0.004	2.55	1.81	0.003
Gas, water, electricity	10,337	8,788	0.021	1.24	1.01	0.007
Maintenance/insurance of:						
- machinery and equipment	28,088	24,411	0.136	3.15	2.72	0.078
- land, buildings, installations	7,404	5,371	0.104	0.88	0.60	0.122
Total non-accountable costs	79,614	65,025	0.002	9.29	7.46	0.001
Available for RDILP	151,928	167,494	0.046	17.22	18.87	0.046

[1]Rent, depreciation, interest, labor, and profit.

Expressed per FTE (Table 6), AMS farms had greater ($P < 0.05$) revenues, margin, and gross margin per FTE than CMS farms. The AMS farms also had a numerically greater RDILP per FTE (€12,953). Because there was no difference in the use of external labor, this means that the farmers using an AMS do not save money by reducing external work, but increase their opportunity costs by reducing their own labor. This is a clear advantage of automatic milking that might differ from farm to farm, depending on opportunity costs of labor on a specific farm, which might vary from 0 to €21,840 (1,092 h at €20/h).

Table 6. Average revenues, costs, margin on dairy production, gross margin, and money available for RDILP[1], expressed for full time equivalent for labor (1 FTE = 2,540 h) for the difference between automatic milking system (AMS) and conventional milking systems (CMS) for the year 2003

	Milking system	
Item	AMS31	CMS31
Total revenues	206,378	164,250[a]
Total costs	57,796	48,463
Margin on dairy production	148,582	115,787[a]
Gross margin	163,056	127,939[a]
Available for RDILP	101,372	88,429

[a] Different ($P < 0.05$) from AMS.
[1] Rent, depreciation, interest, labor, and profit.

Results shown so far, do not account for depreciation and interest. For several reasons, the exact depreciation of AMS and CMS are not known. Because depreciation and interest are important factors in the financial results of a farm business, we chose a normative in estimating these costs. Average purchase value of the AMS (including costs for the building) was estimated to be €177,419, with a yearly

depreciation of €15,968, and a calculated average yearly interest of €4,879. This resulted in average total equipment costs for an AMS, excluding maintenance, which was part of the data described above, of €20,847. Average purchase value (including costs for the building) of a CMS was estimated to be €78,210. Estimated yearly depreciation and average yearly interest were estimated to be €4,953 and €2,053 respectively. Average total yearly costs for a CMS were €7,006. This was €13,841 less than the estimated yearly costs for an AMS. Although most economic studies (Cooper and Parsons, 1999; Arendzen and van Scheppingen, 2000; Hyde and Engel, 2002) use a shorter economic life time for an AMS, no reliable estimates exist on the economic life span of an AMS in comparison to a CMS. The, assumed, shorter life time, however, may in practice be compensated with a greater replacement rate of components of the AMS. In our study, we also found numerically greater maintenance costs for the AMS. Economic life span of the AMS is important because of its profitability relative to a CMS. If the economic life span of an AMS equaled that of a CMS, difference in costs for depreciation and interest between the 2 systems would be €8,518 instead of €13,841. For future comparisons, it would be good to gain more insight into the real economic life span of AMS and CMS.

Given the present results, it is clear that profitability in terms of money available for RDILP is smaller in farms using an AMS. Moreover, farms with an AMS have larger depreciation and interest costs compared with the farms using a CMS. As calculated above, on average, the maximum opportunity costs is €21,840 (1,092 h at a rate of € 20/h). On average, this amount is not enough to cover the increased costs for depreciation (€13,841) and lesser amount of money available for RDILP (€15,566). This indicates that for many dairy farmers, adoption of an AMS system is more than just a pure economic decision, but a socio-economic decision (Hogeveen et al., 2004; Mathijs, 2004).

Conclusions

Farms with an AMS used on average 29% less (own) labor than farms using a CMS. Farms using a CMS had larger revenues (€7,899), but farms with an AMS had smaller costs, especially livestock (€2,354) and feeding costs (€2,918). No differences in margin on dairy were detected between the 2 milking systems. Fixed costs (excluding labor, depreciation, and interest) were larger for AMS than for CMS farms (€ 4,589). Larger fixed costs were caused by larger contractor costs (€6,422) and costs for gas, water, and electricity (€1,549). Because of these larger costs the farms using a CMS had more money available for RDILP.

When expressed per FTE, AMS farms had greater revenues, margin, and gross margin per FTE than CMS farms. The AMS farms did have a numerically greater RDILP per FTE (€12,953) than that for CMS farms. Although depreciation and interest were not available in our study, normative calculations showed larger depreciation and interest costs for AMS. When deciding between investment in an AMS or a CMS, dairy farmers must weigh decreased labor needs for the AMS against increased fixed costs of milking with an AMS.

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DAIRY FARMERS' PLANS IN CENTRAL EUROPE UNDER NEW EU POLICIES

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Abstract

After accession to EU, farmers in the new-member states need to adjust to the EU agricultural policies. A review is presented of county reports from the Central and Eastern European countries. As case study of small scale farming an analysis is made of plans and extension aspects of farm development in Slovenia. As tool a questionnaire was distributed to dairy farmers: 1114 have been returned anonymously, representing 10 % of the dairy farmers' population. Strategies and their interest in technical knowledge are analysed in relation to base parameters, like age of farmer, size of farm, less favoured area or not, etc. Results show a significant demand for info about EU premium programs, a considerable activity in farm planning of which 64% of farmers opt for specialisation and 54 % also for forms of diversification. Opportunities for special regional products will be discussed. A comparison of results can be made with some data in The Netherlands.

Key words: dairy farming, planning, choices, specialisation, diversification

Introduction

In this contribution first some developments in the Common Agricultural Policies concerning the dairy sector will be outlined. This includes schemes of assigned quota amounts as well as trends in the livestock populations in Central and Eastern European countries. Then a summary of observations about the developments in and challenges for the dairy sector in Central and Eastern European countries will be presented. Some strategies at farm level will be shortly discussed as well as a case study of small scale dairy farming.

EU Agricultural Policy for Dairy Sector

Objectives of the EU agricultural policies are summarized in the next box. These policies were formulated in 2002-2003 by EU commissioner Fishler.

EU Agricultural Policies

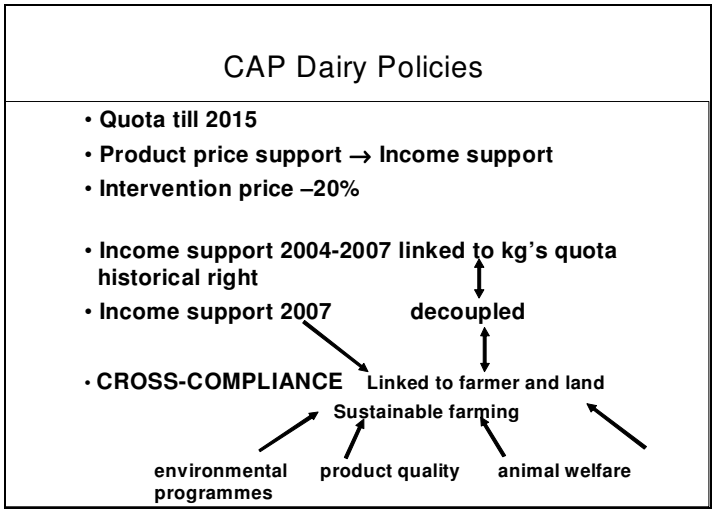
Objectives

- To improve competitiveness of EU agriculture
- To promote a more market oriented and sustainable agriculture
- To give more emphasis to rural development

The Common Agricultural policy for the dairy sector is depicted in Figure 1. Lower prices are accompanied by income premiums. The income premiums are meant to compensate for the lower milk prices which tend to come closer to the world market level. The cross-compliance conditions are introduced to stimulate good farming practices.

The conditions of cross-compliance have to be met to receive the income premiums (the first years paid in the form of a premium per kg milk). The cross-compliance conditions are linked to environmental wishes, product quality and animal welfare issues. In general the CAP policies are these days more directed to support a society oriented sustainable development of the rural countryside. A small part of the available agricultural income subsidies can be devoted directly to the needs of the rural areas. Under the circumstances of the pressure of lower milk prices in Western-Europe and direct subsidies the development plans of farmers in some countries was studied.

Figure 1: CAP Dairy Policy



Observations about Challenges for Dairy Sector in Central and Eastern European Countries

Three workshops were held in 2003 and 2004 to discuss the future of the dairy sector in the Central and Eastern European countries. All eight candidate countries and also Romania, Bulgaria, Albania and Turkey prepared a country report about the dairy sector. The most common challenges mentioned in the country reports are summarized in the box below (see EAAP Technical Series no 8, A. Kuipers, M. Klopcic and A. Svitojus, 2006: Farm management and extension needs in Central and Eastern European countries under the EU milk quota).

Challenges in CEE countries

Opinions in CEE country reports:

- Utilize low cost structure of CEE country
- Reshape downward trend in cattle population
- Support restructuring of sector
- Attract investments in sector (under-financed)
- Shift attention in breeding more to protein and health and longevity characteristics
- Improve milk quality to EU standards
- Improve fodder crop base

- Extension worker should act as business consultant

When thinking about the future the farmer and his adviser can choose from a set of different strategies. The most common general strategies can be described as follows:

Development strategies
1. Specialisation – more cows, higher production
   Emphasis on bulk production
2. Diversification 1 – other animal branches
3. Diversification 2 – special activities
   Emphasis on surroundings and environment
4. Stop farming or part-time farming

To think about a strategy is not simple work. Different levels of management decisions can be identified (see Figure 2). The farmer operates usually in the short run. That means that he is occupied with daily or also said operational work and decision making: when to cut the grass, to-day or to-morrow; what time to fertilize the land, what to do with the sick cow, etc. But very important for developing of the farm business is also to give a bit of attention to tactical and strategic decision-making, that means to think about the future in the medium run (tactical approach) and long run (strategic approach). Especially at small scale farms a session of future oriented thinking may be worthwhile to define the future options. It's already indicated that specialization, diversification and to stop farming are the main streams to go. But, off course, many intermediate steps are possible. For small scale farms diversification represents a likely route to consider. But it's in reality completely dependent on the circumstances.

Figure 2. Decision making in time

Source: Agricultural EconomicResearch Institute LEI, The Netherlands

Case Study Small Scale Farming

To study the developments of small scale farming communities, a case study is being performed in Slovenia. The farmers were asked in winter 2005-2006 about their future plans under the new EU circumstances. For this purpose questionnaires with 27 main questions were distributed to 5,000 dairy farmers out of a total of 10,000 dairy farmers in Slovenia. 1,114 questionnaires were returned anonymously in a closed envelope resulting in a response of 22 %. This group of farmers represent 11 % of the total dairy farm population. Nevertheless, we have to realise that the returned questionnaires are not

fully a representative sample of the complete Slovenian dairy farm population. That is one of the reasons that we included in the complete results a detailed description of the farm and farmers' characteristics of the sample. The sample appeared to represent the relatively larger farms and the more future oriented farmers.

Three types of variables (answers) are present in this study: continuous, categorical and binomial. Most of the associations between variables appeared to be significant because of the large number of respondents.

Some results referring to choices for specialization and diversification are listed in Table 1. More than half of the farmers chose specialization and nearly half of them chose diversification. However diversification meant in most cases that the choice is made to enlarge the farm with another animal species or maize and grain. The interest in niche products and agro-tourism, etc. was limited. This is probably also due to the complexity and consequences of such a choice.

Table 1: Case study development small farm structure

Slovenia – average farm size: 14 cows		
Ambition to develop farm further	49%	
of those choose for:		
• specialisation	64%	
• diversification	54%	of which choose for
↳ fattening bulls	88%	
↳ grassland		49%
↳ grain/maize		48%
↳ forestry		21%
↳ special local products, ago-tourism, etc.		16%
↳ horses		6%

The interest in EU-premiums differ between the farmers who want to develop their business further and the farmers who have no real plans at the moment to increase or diversify their farm. This is illustrated in Table 2. The level of interest in becoming information about CAP and the milk premium is remarkable. Also other relationships can be seen.

Table 2: Association between development plans and interest in EU-premiums

Future development	No. of farms	Milk prem.	Suckl. cow prem.	Beef prem.	Agr. env. meas.	Exten-sificat. prem.	Early retir. prem.	Comp. paym. region.	CAP
		%	%	%	%	%	%	%	%
Farm as now	459	71,5	19,0	30,5	27,5	30,5	31,6	35,7	56,6
Develop farm further	541	77,4	21,6	38,6	29,6	34,0	33,5	45,3	73,0

Also the interests of the farmers in the different farm skills were inventoried by the questionnaire in Slovenia. The answers of the sample of farmers were compared to two samples of farmers in The Netherlands were the same questions were asked (Table 3). The outcome gives an impression of farmers' interests in different dairy farming structures, these being small scale and average scale farms. The differences in interest for: economics, mineral management, breeding work, labor organization and working with machines, are remarkably. In general the farmers in Slovenia express much higher interest

scores for nearly all activities compared to their Dutch colleagues. But it can also be said that they tend to choose less priorities in their work.

Table 3. How much interest do you have for the various technical fields at the farm

Text	Environmental demo farms, The Netherlands	EU pilot farms, The Netherlands	Slovenia
	Score 1 till 10 1 = very important; 10=very unimportant	Yes, big interest %	Yes, big interest %
Feeding of cattle	3.1	68	75
Farming in economical way	3.5	38	61
Grassland management	3.8	67	63
Care for animal health and fertility	3.9	79	77
Milking	5.1	72	79
Mineral management	6.0	22	51
Calves rearing	6.3	52	40
Labour organisation	6.8	37	63
Animal breeding work	7.1	31	60
Working with machine park	9.2	13	61
Protecting nature elements			26
Number of farms	180	153	1.114

Conclusion

This study shows enormous interest in information and knowledge in the new countries of EU and illustrates many questions about the development possibilities of sector and farm. Each region and country has its own characteristics while future plans and interest depend on education level, landscape, culture and the situation one starts from.

PERSISTENCE IN FINANCIAL PERFORMANCE

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Abstract

The purpose of this paper was to examine the persistence of financial efficiency and performance measures for a sample of farms. The profit margin ratio, the asset turnover ratio, and three expense ratios were computed for each farm and year, and for the four-year period. The number of years each farm was in the top and bottom performance quartile was also computed.
Results indicated that it was relatively difficult for a farm to consistently be in the top quartile over time. However, using four-year average data, there was a substantial difference in financial performance between farms in the top and bottom quartiles. Results suggest that using one year of data to benchmark is problematic. However, benchmarking using data for a longer period of time is essential to determining a farm's competitive position.

Key Words: Profit Margin, Asset Turnover, Expense Ratio

Introduction

In production agriculture, farms are diverse in terms of the inputs utilized and outputs produced. Moreover, it is a widely established fact that profitability, efficiency, and per-unit costs vary significantly among farms and ranches (Babcock; Fox, Bergen, and Dickson; Morgan and Langemeier). Are these differences in performance due to random events such as weather or are these differences due to controllable factors such as managerial ability?

The answer to the above question has a direct bearing on benchmarking and the search for a competitive advantage. If performance differences are primarily due to weather, benchmarking is not near as relevant to firms as it would be if performance differences are due to managerial ability or some other resource advantage. An examination of performance differences among farms for different lengths of time (e.g., one-year average, two-year average, three-year average, or four-year average) can help determine the importance of benchmarking.

The purpose of this paper was to examine the persistence of financial performance measures for a sample of farms over a four-year period. Financial performance was measured using the profit margin ratio, the asset turnover ratio, and expense ratios.

Methods

The profit margin ratio, the asset turnover ratio, the total expense ratio, the adjusted total expense ratio, and the economic total expense ratio were used to measure financial efficiency and performance for each farm and year using a sample of Kansas farms. The profit margin ratio represents a commonly used profitability measure. The asset turnover ratio and expense ratios are used extensively to measure financial efficiency or cost control.

The profit margin ratio was computed by adding accrual interest expense and subtracting unpaid family and operator labor from net farm income and dividing by value of farm production. The asset turnover ratio was computed by dividing value of farm production by total assets. The total expense ratio was computed by adding cash costs, accrual adjustments to costs, and depreciation and dividing by value of farm production. The adjusted total expense ratio was computed by adding unpaid family and operator labor to the total expense included in the total expense ratio and dividing by value of farm production. An adjusted total expense ratio below 1.00 indicates that a farm was able to cover accrual expenses, depreciation, and unpaid family and operator labor. The economic total expense ratio was computed by adding the opportunity cost of owned assets to the expenses used in the adjusted total expense ratio and dividing by value of farm production. If the economic total expense ratio is below 1.00 the farm is covering all accrual and opportunity expenses, and is earning an economic profit.

The number of years each farm was in the top or bottom quartile for each financial efficiency or performance measure was computed. Financial performance was also compared across quartiles for each financial efficiency and performance measure.

Data

Data for 1,255 farms in the Kansas Farm Management Association (KFMA) with continuous data from 2002 to 2005 were used in this study. These 1,255 farms represent approximately 82% of the farms with whole-farm analysis data in 2005. To be included in this study, a farm had to have a usable income, expense, and balance sheet data. Income and expense were expressed on an accrual basis. Value of farm production included crop income, livestock income, income from government payments and crop insurance proceeds, and miscellaneous income sources such as patronage dividends and custom work income. Livestock income was expressed on a value-added basis. Specifically, accrual livestock purchases were subtracted from accrual livestock sales to arrive at accrual livestock income.

Table 1 presents the summary statistics for the 1,255 farms. Value of farm production averaged $250,418. The average profit margin was 0.0962 or 9.62% while the average asset turnover ratio was 0.3000. The average total expense ratio, adjusted total expense ratio, and economic total expense ratio were 0.796, 0.964, and 1.147, respectively. As indicated by the percent of farms with an adjusted total expense ratio below 1.00, approximately 48% of the farms covered accrual expenses, depreciation, and unpaid family and operator labor. Only 13% of the farms covered all accrual and opportunity costs. A farm was considered to be financially stressed if it had an adjusted total expense ratio below 1.00 and had a debt to asset ratio above 0.70. Approximately 10% of the farms were financially stressed.

Table 1: Summary Statistics for 1,255 KFMA Farms with Continuous Data from 2002-2005.

Item	Average
Value of Farm Production (VFP)	$250,418
Net Farm Income	$51,100
Interest	$15,187
Unpaid Family and Operator Labor	$42,209
Total Assets	$834,818
Total Debt	$263,680
Total Expense Ratio (TER)	0.796
Adjusted Total Expense Ratio (ATER)	0.964
Economic Total Expense Ratio (ETER)	1.147
Operating Profit Margin Ratio	0.0962
Asset Turnover Ratio	0.3000
Debt to Asset Ratio	0.3159
Percent of Farms with Positive Net Cash Flow	92.51%
Percent of Farms Financially Stressed	9.72%
Percent of Farms with TER less than 1.000	88.92%
Percent of Farms with ATER less than 1.000	48.37%
Percent of Farms with ETER less than 1.000	13.23%
Percent of Farms with VFP less than $100,000	21.91%
Percent of Farms with VFP between $100,000 and $250,000	42.07%
Percent of Farms with VFP between $250,000 and $500,000	26.14%
Percent of Farms with VFP greater than $500,000	9.88%

Source: Kansas Farm Management Association 2005 Databank.

Profit Margin and Asset Turnover Ratio Results

Table 2 presents the number of farms and percent of farms by profit margin and asset turnover categories. Farms in the first category were in the top or bottom quartile for all four years. Only 48 farms or 3.82% of the farms were in the top profit margin quartile for all four years. Approximately 15% of the farms were in the top asset turnover ratio quartile for all four years. The fact that it was relatively easier to be the top asset turnover ratio category than it was to be in the top profit margin quartile is intuitively plausible. The components of the profit margin ratio, particularly net farm income, tend to be more variable than the components of the asset turnover ratio. It is important to note that approximately 51% and 62% of the farms were never in the bottom profit margin and bottom asset turnover ratio quartiles, respectively.

Tables 3-4 present the summary statistics for operating profit margin quartiles and asset turnover ratio quartiles. These tables were creating using four-year average data for each farm. The farms in top profit margin quartile had an average profit margin ratio of 0.2187 or 21.87%. In contrast, the farms in the bottom profit margin quartile had an average profit margin ratio of -0.2132. The farms in the bottom profit margin quartile also had a relatively low asset turnover ratio and relatively high expense ratios. In fact, none of the farms in the bottom profit margin quartile had an adjusted total expense ratio or an economic total ratio below 1.00 and only 62% of the farms covered cash expenses, accrual adjustments, and depreciation. The farms in the top asset turnover ratio quartile had an average asset turnover ratio of 0.6075 while the farms in the bottom asset turnover ratio quartile had an average asset turnover ratio of only 0.1341. The farms in top profit margin and asset turnover quartiles tended to be larger than the farms in the bottom quartiles.

The results in Tables 2-4 suggest that weather and other external factors made it difficult for a farm to consistently be in the top profit margin and asset turnover ratio quartiles over time. However, using the four-year average data, there was substantial difference in financial performance between farms in the top and bottom quartiles.

Expense Ratio Results

Table 5 presents the number of farms and percent of farms by expense ratio category. Farms in the first category were in the top or bottom quartile for all four years.

Table 2: Number of Farms and Percent of Farms by Profit Margin and Asset Turnover Categories.[a]

Item	Number of Farms	Percent of Farms
Top Profit Margin Category		
First Category	48	3.82%
Second Category	109	8.69%
Third Category	214	17.05%
Fourth Category	305	24.30%
Fifth Category	579	46.14%
Bottom Profit Margin Category		
First Category	98	7.81%
Second Category	92	7.33%
Third Category	164	13.07%
Fourth Category	260	20.72%
Fifth Category	641	51.08%
Top Asset Turnover Category		
First Category	189	15.06%
Second Category	82	6.53%
Third Category	73	5.82%
Fourth Category	104	8.29%
Fifth Category	807	64.30%
Bottom Asset Turnover Category		
First Category	184	14.66%
Second Category	74	5.90%
Third Category	83	6.61%
Fourth Category	132	10.52%
Fifth Category	782	62.31%

[a] Farms in the first category were in the top or bottom quartile for all four years. Farms in the second category were in the top or bottom quartile for three of the four years. Farms in the third category were in the top or bottom quartile for two of the four years. Farms in the fourth category were in the top or bottom category for one of the four years. Farms in the fifth category were not in the top or bottom category during the four year period.

Table 3: Summary Statistics for Operating Profit Margin Quartiles.[a]

	Profit Margin Quartile			
Item	First	Second	Third	Fourth
Value of Farm Production (VFP)	$101,069	$221,951	$285,611	$393,497
Net Farm Income	$1,572	$26,324	$56,245	$120,482
Interest	$6,992	$13,757	$16,932	$23,092
Unpaid Family and Operator Labor	$30,113	$37,257	$44,016	$57,497
Total Assets	$510,667	$712,072	$838,516	$1,279,433
Total Debt	$120,636	$231,693	$285,141	$417,742
Total Expense Ratio (TER)	0.984	0.881	0.803	0.694
Adjusted Total Expense Ratio (ATER)	1.282	1.049	0.957	0.840
Economic Total Expense Ratio (ETER)	1.591	1.222	1.112	1.015
Operating Profit Margin Ratio	-0.2132	0.0127	0.1021	0.2187
Asset Turnover Ratio	0.1979	0.3117	0.3406	0.3076
Debt to Asset Ratio	0.2362	0.3254	0.3401	0.3265
Percent of Farms with Positive Net Cash Flow	78.67%	94.90%	98.41%	98.08%
Percent of Farms Financially Stressed	11.15%	18.47%	7.32%	1.92%
Percent of Farms with TER less than 1.000	62.10%	93.95%	99.68%	100.00%
Percent of Farms with ATER less than 1.000	0.00%	19.43%	77.71%	96.49%
Percent of Farms with ETER less than 1.000	0.00%	0.96%	10.83%	41.21%
Percent of Farms with VFP less than $100,000	62.42%	11.46%	7.96%	5.75%
Percent of Farms with VFP between $100,000 and $250,000	32.80%	61.78%	42.68%	30.99%
Percent of Farms with VFP between $250,000 and $500,000	4.46%	21.02%	37.90%	41.21%
Percent of Farms with VFP greater than $500,000	0.32%	5.73%	11.46%	22.04%

[a] The first quartile is represented by farms with the lowest operating profit margin ratio. The fourth quartile is represented by farms with the highest operating profit margin ratio.

Table 4: Summary Statistics for Asset Turnover Ratio Quartiles.[a]

	Asset Turnover Quartile			
Item	First	Second	Third	Fourth
Value of Farm Production (VFP)	$128,948	$239,705	$303,437	$329,836
Net Farm Income	$23,715	$54,995	$65,066	$60,656
Interest	$9,664	$15,044	$18,580	$17,466
Unpaid Family and Operator Labor	$32,236	$42,666	$46,148	$47,803
Total Assets	$961,713	$990,642	$843,059	$542,930
Total Debt	$176,624	$272,945	$315,959	$289,275
Total Expense Ratio (TER)	0.816	0.771	0.786	0.816
Adjusted Total Expense Ratio (ATER)	1.066	0.949	0.938	0.961
Economic Total Expense Ratio (ETER)	1.553	1.188	1.077	1.023
Operating Profit Margin Ratio	0.0089	0.1142	0.1236	0.0919
Asset Turnover Ratio	0.1341	0.2420	0.3599	0.6075
Debt to Asset Ratio	0.1837	0.2755	0.3748	0.5328
Percent of Farms with Positive Net Cash Flow	87.90%	92.04%	95.22%	94.89%
Percent of Farms Financially Stressed	1.91%	5.10%	10.83%	21.09%
Percent of Farms with TER less than 1.000	77.07%	92.36%	94.27%	92.01%
Percent of Farms with ATER less than 1.000	30.25%	46.82%	59.87%	56.55%
Percent of Farms with ETER less than 1.000	0.32%	3.18%	13.69%	35.78%
Percent of Farms with VFP less than $100,000	51.91%	17.52%	9.87%	8.31%
Percent of Farms with VFP between $100,000 and $250,000	37.58%	47.77%	44.59%	38.34%
Percent of Farms with VFP between $250,000 and $500,000	8.91%	26.75%	32.80%	36.10%
Percent of Farms with VFP greater than $500,000	1.59%	7.96%	12.74%	17.25%

[a] The first quartile is represented by farms with the lowest asset turnover ratio. The fourth quartile is represented by farms with the highest asset turnover ratio.

Table 5: Number of Farms and Percent of Farms by Expense Ratio Categories.[a]

Item	Number of Farms	Percent of Farms
Top Total Expense Ratio Category		
First Category	72	5.74%
Second Category	99	7.89%
Third Category	180	14.34%
Fourth Category	307	24.46%
Fifth Category	597	47.57%
Bottom Total Expense Ratio Category		
First Category	51	4.06%
Second Category	102	8.13%
Third Category	200	15.94%
Fourth Category	346	27.57%
Fifth Category	556	44.30%
Top Adjusted Total Expense Ratio Category		
First Category	52	4.14%
Second Category	113	9.00%
Third Category	200	15.94%
Fourth Category	305	24.30%
Fifth Category	585	46.61%
Bottom Adjusted Expense Ratio Category		
First Category	87	6.93%
Second Category	109	8.69%
Third Category	159	12.67%
Fourth Category	263	20.96%
Fifth Category	637	50.76%
Top Economic Total Expense Ratio Category		
First Category	52	4.14%
Second Category	137	10.92%
Third Category	181	14.42%
Fourth Category	271	21.59%
Fifth Category	614	48.92%
Bottom Economic Total Expense Ratio Category		
First Category	133	10.60%
Second Category	102	8.13%
Third Category	109	8.69%
Fourth Category	200	15.94%
Fifth Category	711	56.65%

[a] Farms in the first category were in the top or bottom quartile for all four years. Farms in the second category were in the top or bottom quartile for three of the four years. Farms in the third category were in the top or bottom quartile for two of the four years. Farms in the fourth category were in the top or bottom category for one of the four years. Farms in the fifth category were not in the top or bottom category during the four year period.

Only 5.74%, 4.14%, and 4.14% of the farms were in the top quartile in terms of the total expense ratio, the adjusted total expense ratio, and the economic total expense ratio, respectively. However, there was a substantial proportion of farms, ranging from 48% to 57% of the farms depending on the expense ratio examined, were never in the bottom expense ratio category during the four-year period. Though difficult to maintain a sustained high level of performance, it was possible to avoid substantially below average performance.

Table 6 presents the summary statistics for the total expense ratio quartiles. Farms in the top total expense ratio quartile had an average total expense ratio of 0.625 while those in the bottom quartile had a ratio of 0.997. The farms in the bottom quartile barely covered non-opportunity costs. Approximately 25% of the farms in the bottom quartile were financially stressed.

Summary statistics for the adjusted total expense ratio quartiles are presented in Table 7. Farms in the top quartile had an average adjusted total expense ratio of 0.831 while those in the bottom quartile had a ratio of 1.289. None of the farms in the bottom two quartiles were able to cover accrual expenses, depreciation, and unpaid family and operator labour.

Table 8 presents the summary statistics for the economic total expense ratio quartiles. Farms in the top quartile had an average economic total expense ratio of 0.978 while those in the bottom quartile had a ratio of 1.747. On average, only the farms in the top quartile were able to cover all costs, including opportunity costs. Of the farms in the top quartile, approximately 53% of the farms were earning an economic profit. The economic total expense ratio can be used to measure economies of size. Given the trend in farm size as measured with the value of farm production going from the first to the fourth category or from a low economic total expense ratio to a high economic total expense ratio, there appears to be substantial economies of size in this sample of farms.

The results in Tables 5-8 suggest that weather and other external factors made it difficult for a farm to consistently be in the top quartile over time. However, approximately one-half of the farms were able to stay out of the bottom expense ratio quartiles during the four-year period. Moreover, using four-year average data, there was a substantial difference in financial performance between farms in the top and bottom

Table 6: Summary Statistics for Total Expense Ratio Quartiles.[a]

Item	Total Expense Ratio Quartile			
	First	Second	Third	Fourth
Value of Farm Production (VFP)	$263,122	$284,456	$263,873	$190,262
Net Farm Income	$98,795	$66,329	$38,901	$528
Interest	$9,814	$15,032	$17,956	$17,929
Unpaid Family and Operator Labor	$52,377	$45,604	$39,868	$31,018
Total Assets	$982,289	$919,662	$753,669	$684,124
Total Debt	$200,788	$266,682	$296,607	$290,445
Total Expense Ratio (TER)	0.625	0.767	0.853	0.997
Adjusted Total Expense Ratio (ATER)	0.824	0.927	1.004	1.160
Economic Total Expense Ratio (ETER)	1.061	1.111	1.142	1.326
Operating Profit Margin Ratio	0.2137	0.1257	0.0644	-0.0660
Asset Turnover Ratio	0.2679	0.3093	0.3501	0.2781
Debt to Asset Ratio	0.2044	0.2900	0.3936	0.4246
Percent of Farms with Positive Net Cash Flow	98.72%	98.41%	95.54%	77.39%
Percent of Farms Financially Stressed	0.32%	3.18%	10.19%	25.16%
Percent of Farms with TER less than 1.000	100.00%	100.00%	100.00%	55.73%
Percent of Farms with ATER less than 1.000	87.86%	67.83%	36.31%	1.59%
Percent of Farms with ETER less than 1.000	28.12%	14.97%	9.24%	0.64%
Percent of Farms with VFP less than $100,000	17.89%	14.33%	18.79%	36.62%
Percent of Farms with VFP between $100,000 and $250,000	46.65%	43.95%	38.54%	39.17%
Percent of Farms with VFP between $250,000 and $500,000	24.28%	29.94%	31.53%	18.79%
Percent of Farms with VFP greater than $500,000	11.18%	11.78%	11.15%	5.41%

[a] The first quartile is represented by farms with the lowest total expense ratio. The fourth quartile is represented by farms with the highest total expense ratio.

Table 7: Summary Statistics for Adjusted Total Expense Ratio Quartiles.[a]

	Adjusted Total Expense Ratio Quartile			
Item	First	Second	Third	Fourth
Value of Farm Production (VFP)	$394,500	$296,312	$207,651	$103,668
Net Farm Income	$124,912	$56,306	$24,083	-$664
Interest	$16,138	$17,798	$17,381	$9,434
Unpaid Family and Operator Labor	$58,253	$44,577	$36,787	$29,268
Total Assets	$1,276,926	$853,335	$693,518	$516,903
Total Debt	$318,609	$300,835	$278,142	$157,310
Total Expense Ratio (TER)	0.683	0.810	0.884	1.006
Adjusted Total Expense Ratio (ATER)	0.831	0.960	1.061	1.289
Economic Total Expense Ratio (ETER)	1.025	1.110	1.221	1.566
Operating Profit Margin Ratio	0.2099	0.0996	0.0225	-0.1977
Asset Turnover Ratio	0.3089	0.3472	0.2994	0.2006
Debt to Asset Ratio	0.2495	0.3525	0.4011	0.3043
Percent of Farms with Positive Net Cash Flow	98.40%	99.04%	95.54%	77.07%
Percent of Farms Financially Stressed	0.00%	0.32%	22.61%	15.92%
Percent of Farms with TER less than 1.000	100.00%	100.00%	97.45%	58.28%
Percent of Farms with ATER less than 1.000	100.00%	93.63%	0.00%	0.00%
Percent of Farms with ETER less than 1.000	36.74%	14.97%	0.00%	0.00%
Percent of Farms with VFP less than $100,000	5.43%	6.37%	15.29%	60.51%
Percent of Farms with VFP between $100,000 and $250,000	33.55%	41.72%	58.28%	34.71%
Percent of Farms with VFP between $250,000 and $500,000	37.38%	41.08%	21.66%	4.46%
Percent of Farms with VFP greater than $500,000	23.64%	10.83%	4.78%	0.32%

[a] The first quartile is represented by farms with the lowest adjusted total expense ratio. The fourth quartile is represented by farms with the highest adjusted total expense ratio.

Table 8: Summary Statistics for Economic Total Expense Ratio Quartiles.[a]

	Economic Total Expense Ratio Quartile			
Item	First	Second	Third	Fourth
Value of Farm Production (VFP)	$434,712	$287,576	$187,970	$92,002
Net Farm Income	$112,137	$56,607	$27,676	$8,175
Interest	$24,632	$17,226	$12,976	$5,944
Unpaid Family and Operator Labor	$58,820	$44,664	$36,656	$28,747
Total Assets	$989,041	$876,976	$770,808	$702,939
Total Debt	$443,853	$293,064	$216,887	$101,491
Total Expense Ratio (TER)	0.742	0.803	0.853	0.911
Adjusted Total Expense Ratio (ATER)	0.877	0.958	1.048	1.224
Economic Total Expense Ratio (ETER)	0.978	1.121	1.284	1.747
Operating Profit Margin Ratio	0.1793	0.1014	0.0213	-0.1590
Asset Turnover Ratio	0.4395	0.3279	0.2439	0.1309
Debt to Asset Ratio	0.4488	0.3342	0.2814	0.1444
Percent of Farms with Positive Net Cash Flow	97.12%	97.77%	92.99%	82.17%
Percent of Farms Financially Stressed	6.71%	18.79%	10.19%	3.18%
Percent of Farms with TER less than 1.000	100.00%	97.13%	88.85%	69.75%
Percent of Farms with ATER less than 1.000	91.69%	59.55%	29.94%	12.42%
Percent of Farms with ETER less than 1.000	53.04%	0.00%	0.00%	0.00%
Percent of Farms with VFP less than $100,000	2.56%	3.18%	16.56%	65.29%
Percent of Farms with VFP between $100,000 and $250,000	26.52%	49.36%	60.19%	32.17%
Percent of Farms with VFP between $250,000 and $500,000	43.77%	36.94%	21.34%	2.55%
Percent of Farms with VFP greater than $500,000	27.16%	10.51%	1.91%	0.00%

[a] The first quartile is represented by farms with the lowest economic total expense ratio. The fourth quartile is represented by farms with the highest economic total expense ratio. quartiles. This result stresses the importance of benchmarking financial performance.

Summary and Conclusions

This paper examined the persistence of financial efficiency and performance measures for a sample of farms over a four-year period. Financial efficiency and performance measures included the profit margin ratio, the asset turnover ratio, the total expense ratio, the adjusted total expense ratio, and the economic total expense ratio.

Results indicated that it was relatively difficult for a farm to consistently be in the top quartile over time. However, using four-year average data, there was a substantial difference in performance between farms in the top and bottom quartiles. For example, farms in the top economic total expense ratio quartile had an economic total expense ratio of 0.978 and were on average earning an economic profit. In contrast, farms in the bottom economic total expense ratio quartile had an economic total expense ratio of 1.747 and were thus not even close to covering all of their costs.

Results suggest that using one year of data to benchmark is problematic. However, given the large difference in financial performance using four-year average data for each farm, it is essential that farms benchmark using average data for a longer period of time. The results also suggest that it is possible for farms to have a competitive advantage.

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HOW THE WORLD'S LEADING FARMERS ARE RESPONDING TO GLOBAL CHANGES -A CONSULTANT'S REVIEW

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Abstract

Agribusiness systems (from 'farm to fork') are undergoing enormous changes. This paper first considers the major drivers of change and their dramatic impacts on farmers and farm management systems. Drawing on the authors' experiences working with farmers around the world the paper then considers nine major areas where leading farmers are focusing as they seize the opportunities from the changes .These are: planning (strategic and operational); environmental management; new technologies; co-operation; developing a market-driven focus; business growth; risk management; off-farm businesses and managing people. Examples of successful strategies are given for each of the management areas drawing on case studies from a number of countries. The paper concludes with a check list that managers and their advisers can use to assess how well a farm business has prepared for success in the new world of agribusiness.

Keywords: drivers of change, management systems

Introduction

The world's farmers are managing their businesses in a time of unprecedented change and the pace of change is unlikely to slow. The volatility of production and markets is also likely to increase rather than diminish.

The roles of farm managers have never been more interesting or challenging.

This paper reviews how leading farm managers in a wide range of countries are responding to the changes and positioning their businesses for success in the years ahead.

The paper is not the result of formal academic research. It draws on information obtained during consulting work in Australia, New Zealand, Africa, North and South America, Europe and Asia. The authors have travelled widely in the major agricultural areas of the world visiting farms, learning from farmer presentations and working with leading farmers in executive training programs. They are members of best practice groups, on top farmer panels and deliver presentations and workshops on leading farm management strategies. They are the authors of a book on strategic management for farm managers.

In order to better understand the changes facing farm managers, the authors also constantly review changes in all the other links of agribusiness supply chains – farm input suppliers, transporters, processors, retailers and, most importantly, consumers.

The paper begins with a brief consideration of the major drivers of change. The dimensions of the changes indicate why there is a revolution in the roles of farm managers.

The body of the paper discusses the responses of the world's leading farmers to the changes. Nine areas of managerial focus are considered with inspirational examples of successful strategies.

The areas where the leaders are focussing are summarised in the form of a check list that can be used to assess the strengths and weaknesses of a farm business.

Drivers of Change

A Marketing Rrevolution

Enormous changes are occurring in the way agricultural products are marketed. These include:

- deregulation of most markets
- a change from production-driven to market-driven agriculture
- demands for quality assurance and traceability
- division of many markets into segments, each requiring specific marketing strategies
- global competition with emphasis on the performance of entire supply chains
- pressure from retailers and processors for a smaller number of professional suppliers.

There is a marketing revolution forcing farmers to think in terms of customers, value chains and the requirements of the total food/fibre system.

Declining Terms Of Trade

The ongoing cost/price squeeze in agriculture results in small margins on raw (undifferentiated) commodities. This is driving some farmers to lower costs through increased scale and/or to seek higher margins through value adding.

Globalisation And Consolidation

World markets for agricultural products have become globalised, aided by a transport and logistics revolution. Large processors and retailers shop globally, creating intense competition. World trade is progressively being freed up so there is nowhere for farmers to hide from competition.

A merger frenzy in the food chain is resulting in enormous market power for multinational companies. Many food-based companies are diversifying into related industries (for example, the recent purchase by Nestlé of the weight loss company, Jenny Craig).

New Technologies

New technologies such as precision farming and biotechnology are also driving huge changes in agriculture. Most new technologies require a larger scale for effective implementation and most require higher levels of management.

Management Innovation

Leading managers are discovering that they can operate agricultural businesses very differently from traditional approaches. New business models, often adapted from non-farming industries, are being used. New approaches to management, organisational structure, financing and resource use are now a driver of changes. This is accelerated by the global sharing of knowledge between leaders.

Government Policies (Domestic And International)

Government policies remain an important driver of change. There is ongoing pressure to establish freer world trade through bilateral and multilateral agreements. Governments continue to change regulations on issues such as tariffs, quarantine and environmental management. Knee-jerk reactions to food safety issues can create market shocks. Policies on currency and interest rate settings, farm support programmes and the adoption of new technologies such as genetically modified organisms (GMO's) can have significant implications. The unpredictability and nature of policy changes can create increased risk for farmers and has enormous bearing on the directions agriculture takes (for example, the current policies regarding ethanol in the USA).

Environment Management Challenges

Environmental management issues are in the forefront of the minds of the community and governments. Demands for changes, many with significant implications for agriculture, will be relentless. Key issues are: climate change, water (quality and quantity), energy, environmental degradation, air quality and biodiversity.

Consumer and Community Demands

The demands of consumers and the community at large are constantly changing and expanding, affecting the directions of agriculture. Perceptions, whether based on reality or not, drive the decisions of governments, and food and fibre processors and retailers. Demands for characteristics such as consistency, reliability of supply, food safety and traceability are shaping the nature of supply chains. Health, environmental and animal welfare attributes are important drivers of demand in some market segments as are cultural and religious issues.

Outcomes of Change

The drivers of change discussed above are resulting in four major outcomes for agriculture. The first is structural change favouring larger farms and reducing the number of medium-sized farms (the disappearing middle).

The second is a similar effect on supply chains. The “critical mass” for a viable supply chain supporting transporters, processors and retailers is steadily increasing. In some agricultural areas, difficult decisions on what to give up will be required if industries are to remain viable.

A third outcome is greatly increased vertical coordination in order to satisfy demands for traceability/quality assurance and to increase supply chain efficiency.

The fourth outcome creating both opportunities and challenges for farmers is the demand for farms to be multi-functional. No longer is the role of farm businesses seen to be solely as the providers of agricultural products. Farm businesses are required to provide a range of environmental, landscape and recreational services. Agriculture is being integrated with other industries such as tourism, health and recreation.

Responses of Leading Farmers

Leading farm managers are focussing on nine major areas of their businesses as they respond to global changes.

Planning (Strategic and Operational)

An outstanding attribute of top farmers is their ability to plan both at strategic and operational levels. They are prepared to think strategically and creatively, courageously scanning global developments and positioning their businesses to seize the opportunities from change. They fearlessly analyse the strengths and weaknesses of their businesses, are prepared to question everything they do and to make major changes if required.

A critical factor for success is the preparation of written business, personal and family goals that are regularly modified as circumstances change. Setting goals gives direction and purpose. In the words of one Australian farming family, "setting goals has reinvigorated our whole farming energy".

Business plans are also considered to be an important management tool. These are comprehensive, regularly modified and communicated to key members of the management team.

Leading farmers also focus on the operational side of their businesses. They develop detailed operational manuals for key tasks. By developing and documenting systems, they are able to grow their businesses without losing control. For example, a husband and wife team with a rapidly growing business in Western Australia, has developed detailed manuals for sowing, harvesting and spraying operations. These manuals are reviewed with staff after each season and continuously improved. Delegation is made easier so that managers are freed up from operational tasks. Another farmer in New Zealand who markets over 400 000 lambs each year has developed a system whereby the pasture availability on over 1 000 fields can be monitored each month.

As a result of a comprehensive approach to strategic and operational planning, leading farm managers are able to re-define their management roles, develop appropriate structures for their businesses and focus on the major determinants of business success.

In order to ensure objectivity and excellence in planning and decision-making, an increasing number of farm families are appointing boards of independent experts to regularly review all aspects of their businesses.

Successful farm businesses tend to use more outside expertise than others. They have a philosophy of continuous improvement.

Innovation in Environmental Management

Leading farmers recognise that demands for improved environmental management will increase rather than diminish.

They are beginning to see that there are business opportunities emerging from meeting consumer and community demands. So, rather than being defensive, they are "on the front foot" developing their environmental credentials and seeking innovative ways to improve the sustainability of their farming systems. Strategies such as minimum tillage, integrated pest management and improved water use efficiency are used.

It is recognised that in many situations farms are required to be multifunctional – providing not only products but also ecosystem and other services. For example, a farm in New Zealand runs large sheep and cattle enterprises and also has tourism and hunting enterprises, plus a large government-supported conservation project to maintain biodiversity.

Leading farmers understand that to achieve good outcomes on environmental issues, it is important to involve stakeholders and seek to win their support.

Selecting and Managing New Technologies

First and foremost, leading farmers focus on achieving excellence in their production systems.

When examining the histories of successful farm businesses, it is common to find that early adoption of new technologies has played a critical part in their success.

Top farmers work closely with researchers and often manage projects for researchers on their farms. This way they not only see the results on their farms, but are also better able to adopt new technologies early with lower risk. Many farmers work with researchers in groups (for example, the Birchip and Liebe groups in Australia) and so are better able to have research designed for their needs.

Groups of leading farmers also work together to more effectively learn how to implement new technologies. For example, a group of 16 farmers in South Africa closely monitor one another's experiences with the introduction of precision farming technologies.

New technologies typically require higher levels of management. Leading farmers are all the time learning about potential new technologies, experimenting for tomorrow and positioning for early adoption. They recognise that the benefits from new technologies only last for a short time, so they must be constantly looking for the next opportunities for productivity gain.

Leading farmers often find it best to implement new technologies by outsourcing to expert contractors with state-of-the-art equipment. This also saves farmers capital on new equipment that may be underutilised.

Farmers Working Together

Traditional farmers typically have a strong culture of independence. In a world where scale is increasing in all parts of supply chains, small businesses need to "be small but act big" by working together.

Effective cooperation depends on high levels of trust. Where trust levels are low as in some communities, significant inefficiencies arise.

Top farmers focus on finding kindred souls who are striving for success. They build trust so that a range of working relationships can be developed.

Cooperation can be in the form of purchasing groups (one South African group of 16 farmers claims an average discount of 15 percent over all inputs), information sharing (one group of about 500 farmers in Australia conducts comprehensive benchmarking analyses), marketing groups or management groups.

Many networks of leading farmers are working together to learn from one another, share expertise and develop new management and marketing models.

Cooperation can require a change in mind-set. As one Canadian farming couple have said: "Understand your competitors – they are often your best partners."

Becoming Market-Driven

The marketing revolution in agriculture is opening up huge opportunities for improved profitability, but unfortunately the vast majority of farmers are ill-prepared.

Leading farmers are recognising the opportunities and investing heavily in learning what it is to be a marketer. They are also developing the relationships necessary for success. They are transforming their businesses in line with customer needs and demands. By active participation with customers and constantly monitoring market trends, they can anticipate market changes and achieve rewards.

Top farmers understand that the real competition is between supply chains and that their rewards depend on the performance of all those in their supply chains. They coordinate vertically in supply chains and look for products and services for which they will be rewarded.

They are prepared to implement quality assurance and traceability systems in line with customer demands and as well, look to achieve management benefits by implementing these systems.

They recognise that margins on undifferentiated commodities will remain small and so look to develop special attribute products combined with services that add value for their customers. They also recognise that "today's niche is tomorrow's commodity", and are thus constantly looking for the next differentiated product or service.

With globalisation and consolidation in the processing and retailing sectors, leading farmers are growing their businesses and working together to ensure sufficient volumes for market access.

Through active participation in markets and excellence in risk management, leading farmers are also better able to manage market shocks such as food safety scares or major shifts in product supply (for example, the recent huge plantings of apples in China).

Growing the Business

The drivers of change are putting pressure on farm managers to grow their businesses. But growth is not just about size. "Get big or get out" has been a catch cry of some but others are finding that they can grow their businesses by increasing profit margins and/or developing other businesses in association with their farms without having to increase farm size.

When considering growth, managers need to understand whether the constraints are primarily due to the personal capacity of the manager, the organisational structure, limited resources or a combination of these.

Over the last 30 years or so wealth creation in a typical family farm business has been largely due to capital gain (one New Zealand accountant estimates over 85 per cent of wealth creation from capital gain for that country's farm businesses). Agricultural businesses are typically asset rich and cash poor.

Leading farm business managers are determined to achieve a cash rich balance sheet. They separate their land business from their operating business and ensure that both are profitable. By having available cash, they retain decision-making control and can gain advantage from the fluctuations in agriculture's fortunes.

Very few leading farmers attempt to grow their businesses while retaining ownership of all the assets. Most leverage their capital through strategies such as syndicates, leasing, shared-farming, equity partnerships and franchises.

Many are able to attract outside investor capital through offering business propositions that meet the goals of both the investor and the operator.

As businesses grow, management systems, including excellent records and cost control, are required.

Risk Management

Traditionally the major risks addressed by farm managers have been associated with production and marketing.

As supply chains become much more coordinated and farmers cooperate more with one another, the risks of relationship breakdowns become more important.

Also, with demands for food safety/quality and occupational health and safety, risks associated with the performance of people within and outside the business must be carefully managed.

Strategic risks such as changing government policies, the positioning and flexibility of the business and changes in competitiveness are often ignored. They may have low probabilities of occurrence, but can have big consequences if such events occur.

Leading farmers are becoming skilled at developing comprehensive risk management plans. They recognise that risk is not necessarily negative – volatility can also open up opportunities.

Adding Businesses to the Farm Business

Management of farm businesses now requires the same skills as the management of any other business.

A significant proportion of top farm businesses (for example, more than half of those at a recent meeting of an alumni group of a USA agricultural executive programme) are now associated with other businesses that may or may not be related to agriculture.

This can achieve improved risk management, complementarities with the characteristics of a farm business (for example, greater cash flow) and better use of managerial, financial and physical resources.

Those who develop successful off-farm businesses take care to evolve appropriate organisational structures, including delegation to make sure that the management of their core farm business does not suffer.

They recognise the need to develop capabilities and relationships associated with new businesses. For example, one New Zealand farmer who has developed a “muffin break” franchise business in a distant city, delegated to his wife and children to operate their farm while he spent five months learning how to manage the new business.

With today's communication technologies leaders do not see geographical isolation as a barrier to developing off-farm businesses. For example, the same farmer mentioned above, is able to access real time video images of his “muffin break” store through his computer wherever he might be in the world.

Managing People

The management of people in agriculture is an area for potential major productivity improvement. Most farmers agree that people management is not one of their strengths.

Leading farmers recognise their increased dependence on the performance of people – family members, their employees and others associated with their businesses.

All over the Western world farm managers are concerned at the shortage of suitable employees who can handle the increased complexity, risks and the need for greater horizontal and vertical coordination.

Leaders now regard people as an investment rather than a cost. They focus on effectively employing all their human resources, including themselves, women and young people. They accept the challenge of creating stimulating work places that will attract people of all ages and both genders.

They understand that the best insurance policy for future success is to develop their own capabilities and those of everyone associated with their business. So they have learning plans driven by the goals of their business.

They also understand that with the changes in agriculture it is necessary to develop generic skills – those required to manage any business – skills in information management, marketing, people management, creative and critical thinking, planning, learning, etc. These skills have the added advantage that they are not "perishable" (i.e., they will be useful for a lifetime). Previously most learning in agriculture has been focussed on specialist skills that often become redundant in a short time.

As mentioned in section 4.1 on planning, leaders recognise the importance of clear written goals. If these are communicated to other people in the business, along with the plans for their achievement, then motivation and focus can be improved.

The leaders are adopting many people-management procedures used in non-agricultural businesses such as induction, job descriptions, job instruction and appraisal.

There is more emphasis on work planning, delegation and time management so that managers can spend more time working *on* the business rather than *in* the business.

Succession planning and family teamwork remain amongst the greatest challenges for family businesses and the leaders now regard these as critical management tasks.

Assessing How Well a Business Is Prepared For Success – A Ten Point Check List

The table below summarises ten key areas where leading farmers are focussing.

Table 1: A checklist for success – What leading farmers do?

1. Plan from the outside in, not the inside out (holistic or strategic approach)
2. Have written business, individual and family goals
3. Develop business plans and operational systems
4. Seek and evaluate new technologies
5. Are active in customer-driven coordinated value chains
6. Work together with like-minded people
7. Grow the business using new management models
8. Prepare risk management plans
9. Look for opportunities to add businesses
10. Achieve excellence in people development, management and succession planning

Conclusions

In spite of much gloomy publicity surrounding agriculture, top family farm businesses are making money and achieving other important goals for their owners. They have profitable farm businesses. They often have successful off-farm businesses. They invest early and wisely and perform consistently so that over time, through their operating businesses and capital gain, above average wealth is generated.

Leading farmers understand that best practices are common globally and therefore develop international networks and regard travel as mandatory.

They are "surfing" – riding the waves of change, ever alert to new threats and opportunities.

They question everything, cull sacred cows and are prepared to redefine their roles to seize the opportunities from the new agriculture.

They are passionate about what they do and seek to maximise creativity to benefit from change.

As they read the winds of global change, they especially focus on being great people managers, great marketers, and great learners.

(Note: Further detail on planning processes discussed in this paper can be found in Nell, W.T. & Napier, R.J. 2005. *Strategic Approach to Farming Success.* Published by Wim Nell, Bloemfontein, South Africa)

A NEW APPROACH IN FARM BUSINESS ANALYSIS TO FIT A CHANGING FARMLAND INVESTMENT MARKET

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Abstract

Increasing non-farm demand for land in developed countries is changing the farmland market and the business dynamics of owning it. Farmland's value is now based less on the economic value of farm products it can produce and more on the non-farm characteristics and uses it can provide. This change has implications for farm business management decisions leading to the need for a new approach to the economic analysis of the farm business. This new approach calls for treating farmland as part of an investment portfolio, profit centre, rather than as a production cost input. This changes the traditional approach to cost budgeting and analysis of farm enterprises. Managers need to view the land ownership decision more as an investor in the land than as a producer on the land. This may have implications for developing countries in the future as well.

Key Words: farmland, cost analysis, cash rent, capital gains

Farmland, for most types of production agriculture, is the single largest asset in a farm business. In the United States agricultural sector as a whole, statistics from the US Department of Agriculture (USDA) reveal that farm real estate accounted for 85% of the value of total farm assets in 2006. (1) That percentage has steadily increased over time; in 1950 for example it was 62%, in 1970---73%, in 1990---74%. Similarly debt on real estate dominates the liability side of the balance sheet, constituting 55% of total farm debt in 2006. However, the debt percentage has not risen significantly over time, being 48% in 1950, 56% in 1970, and 54% in 1990. It is not surprising then to find that real estate is increasingly the primary placeholder for equity, accounting for 89% of total farm equity in 2006.

By virtue of farmland's dominant financial position, any management and analysis of a farm business must pay close attention to the effect the farmland asset has upon the balance sheet, net income and cash flow.[2] This effect has not been examined closely enough, as Oltmans points out in his explanation of why farmland cannot and should not pay for itself. *"...there is no long term farm income (profitability) problem, but there is a persistent cash flow problem. The cash flow difficulty is not the result of low returns or high asset costs....Rather, the difficulty is the natural result of the land ownership problem. It is the natural economic nature of land that is a primary cause of the persistent 'farm cash flow problem'.....Farm policies....will never solve the inherent cash flow difficulty of a land-based industry."* (2) Land ownership activity causes severe cash flow and current income problems that, without proper separation from production activities, can distort the economic/financial flow of information, which in turn can cause an incorrect analysis and management of the farm business.

With recent market developments, this distortion is becoming more pronounced and a more serious issue. Increasing non-farm demand for land in developed countries is changing the farmland market and the

[2] Farm real estate includes both farmland and non-land capital assets (buildings, fences, other capital improvements). Farmland has comprised 85-90% of total real estate valuation over the time frame cited above. Thus, farmland alone accounts for approximately 75% of assets and equity.

business dynamics of owning it. Farmland's market value due to the economic value of the products it can produce, i.e., the net profit land can generate in the short run, is diminishing; more of its value is being derived from the non-farm characteristics and uses it can provide. In the U.S. market of the last 4-5 years, for example, farmland prices have been driven upward by an increasing demand to own land for recreation, lifestyle enhancement, development, investment (portfolio diversification), tax deferral, speculation ("safe haven"), and environmental amenities (scenery, viewscape, open space, water and air quality), and other values or uses that individual buyers hold which are exclusive from using the land to produce (i.e., to farm). Land has "place value" as well as productive value. This place value may exceed the productive value, as witnessed in numerous local markets across the U.S. where lower quality, in terms of productivity, land sells at a higher price than land of higher productive quality.

One result of this market change has been a lower rate of current return on investment for farmland. Using cash rent paid as an approximation of the amount of current net income that can be earned from production (i.e. "farming" the land), one can examine this effect. The 2006 farmland survey by the USDA revealed that the average rent-to-value ratio for cropland in the U.S. was 3.3% and for pastureland 1.1%. This author's own state of North Carolina has even lower ratios of 1.4% and .5% respectively. (3)

Inverting the rent-to-value ratio yields a type of price-earnings ratio commonly used in stock market analysis. Thus, the P-E ratio for U.S. farmland in 2006 was 33 for cropland and 91 for pastureland, with North Carolina land at 71 and 200. Stock market investments with these high P-E ratios and/or low dividend yields would clearly be looked upon as growth stocks rather than income stocks and would be managed and invested in as such. Such stocks would be looked upon not for their short term cash dividends return above holding costs but for their long term growth potential above long term costs. Farmland, as an asset owned by the farm business, with these levels of earnings or P-E ratios must also be managed and invested in with a similar view.

But perhaps these ratios represent a recent speculative bubble in the U.S. farmland market and not the long term relationship of rent-to-value. While there may be some recent abnormal market activity, a look over time shows that the rent-to-value ratio has steadily declined from the 6-9% levels of 40-50 years ago. However, the long term total rate of return to farmland, when both current earnings and capital gains are combined as the income generated by farmland, has not declined. This total rate of return has consistently been in the 10-12% range. Thus, over time, the return to farmland has shifted, more of it coming in the form of capital gains (recently at 8-10% per year) and less in the form of current earnings (recently at 2-4% per year).

This shift towards higher capital gains and lower current income has major management implications for purchasing and owning farmland. The economic analysis of farm businesses must now employ a new approach that treats farmland as a profit centre in itself, as part of an investment portfolio, rather than a production cost input only. This changes the traditional approaches to whole farm and enterprise cost analysis and budgeting. Managers need to view the land ownership decision more as an investor **in** the land and less as a producer **on** the land. While the numerical technique for doing this is not a difficult adjustment to make, the change in thinking---from a producer (farmer) to an investor---is major. The results can yield entirely new insights. In hindsight this new approach should have been used long ago since farmland ownership has always presented a "problem" in production analysis. The current and future dynamics of the farmland market simply makes the case for this new approach now even more compelling.

Fundamentally, this proposed new approach calls for removing the ownership costs of land, primarily interest and property taxes, in any farm business analysis, and replacing those costs with a market rate of cash rent opportunity cost. These ownership costs would be assigned to the farmland investing business instead so that the economics of farm production can be clearly separated, seen and analysed apart from the economics of land investing. Farmland investment earnings would be credited with the cash rent as

well as the unrealized capital gains that accrue. All of this would be done for both profitability and cash flow analysis.

A simple illustration of a hypothetical farm business shows how this can be implemented. Assume the following set of financial information on a 500 acre grain farm for a given year:

Assets (other than farmland)	$500,000	
Farmland (500 acres at $4,000/acre)	$2,000,000	
TOTAL ASSETS		$2,500,000
Debt (other than farmland)	$200,000	
Debt on farmland	$1,500,000	
TOTAL DEBT		$1,700,000
Equity (other than farmland)	$300,000	
Equity in farmland	$500,000	
TOTAL EQUITY		$800,000

Market rate of cash rent---3% or $120/acre---$60,000 total
Rate of capital gain appreciation on farmland---7%---$140,000

Table 1 shows a condensed profit analysis of this farm, using a traditional approach inclusive of all costs associated with the "farm" business. With a net farm income of ($-30,000), a negative return to labour and management of ($-90,000) and an ROA of only 3.6%, the profitability of the business looks bleak. Neither of the two major enterprises show a profit, and the prices (not shown) received for corn and soybeans are apparently below the cost of production. A cash flow analysis is not shown, but it is not a stretch to surmise that the net cash flow would be negative as well. The overall economic picture, though dismal, would not be all that unusual for an owner-operator farm in U.S. agriculture, as continual calls for governmental income support over the past 60-plus years indicate. "*You just can't make any money farming*." is an all-too-familiar refrain. Yet, farms keep being farmed, farm life continues, farms expand, and new farms come on board.

Table 1: Traditional Analysis of Hypothetical Farm

	Whole Farm	**Farm Enterprises**	
		Corn (300 acres)	**Soybeans (200 acres)**
Income: Products Sold	$215,000	$150,000	$65,000
Expenses: (except for land)	110,000	85,000	25,000
Net Income before Land Charges	$105,000	$65,000	$ 40,000
Land Charges: Property Tax	$ 15,000	$ 9,000	6,000
Interest on Debt (8%)	120,000	72,000	48,000
Net Farm Income	(-$30,000)	(-$16,000)	(-$14,000)
		(-$53/acre)	*(-$70/acre)*
less Interest on Equity (8%)	$64,000	$38,400	$25,600
Return to Labour and Management	(-$94,000)	(-$54,400)	(-$39,600)
		(-$181/acre)	*(-$198/acre)*
Return on Assets (ROA)	3.6%		

But is money really being lost in the farming operation? Are commodity prices below the cost of production? Is this a case of sub-par production or poor farm management? Or, is this a case of mixed analysis that does not adequately reveal the true economic process at work in this farm operation? The answer is "Yes" to only the latter question, as further analysis reveals.

Table 2 expands on the information in table 1 by including a column for analysing the land investment as a business activity separate from the farm business. It implies that the costs and returns from the decision to own farmland is not a direct part of the farming business. The economic implications of owning land are analysed and justified within the context of an investment decision rather than a production decision. Table 2 establishes land as a profit centre in itself with the costs properly assigned to both "land" and "farming".

Table 2: "New" Analysis of Hypothetical Farm

	Whole Farm	**Farm Enterprises**		**Land Investment**
		Corn (300 acres)	**Soybeans (200 acres)**	
Income: Products Sold	$215,000	$150,000	$65,000	----
Cash Rent Value	----	----	----	$ 60,000
Expenses (Except for Land)	110,000	85,000	25,000	----
Net Income before Land Charges	$105,000	$65,000	$40,000	$ 60,000
Land Charges: Cash Rent	$60,000	$36,000	$24,000	----
Property Tax	----	----	----	15,000
Interest on Debt	----	----	----	120,000
Net Farm Income	$45,000	$29,000	$ 16,000	----
		$96/acre	*$80/acre*	
Net Land Income				(- $75,000)
less Interest on Equity	$24,000	$14,400	$9,600	$40,000
Return to Labour and Management	$21,000	$14,600	$6,400	(-$115,000)
		$49/acre	*$32/acre*	
Return on Assets (ROA)	9%			2.25%
Unrealized Capital Gain				$140,000
Total Net Return to Land				$ 25,000
Total ROA on Land Asset				9.25%
Total ROE on Land Equity				13%

In this process only the amount of cash rent that could be received on the land is charged to the farm operation as a land cost. This rent becomes income to the land investment, which in turn incurs the costs of property tax and interest. This allows the farm business operator to see the profitability of production without being encumbered by a non-production decision to own instead of rent the land. On this basis, one can clearly see that the farm operation, as a whole as well as by enterprise, is indeed profitable with a

net farm income of $45,000, a return to labour and management of $21,000, and an ROA of 9%. A cash flow analysis, while not presented here, would reveal a similar pattern. There is not a farm profitability problem; rather, the profit problem in table 1 was the result of a decision to own land. Commodity prices for corn and soybeans are above the cost of production, and the production management of the farm could be judged as "good". The distinction between a decision to produce (to farm) on the land and a decision to own the land is huge and vitally important to make.

As the last column of table 2 shows, the return from land ownership in the form of cash rent (or alternatively the current earnings that could be expected from production) does not cover the cost of ownership, resulting in a Net Land Income of $-75,000 and a low ROA of 2.25%. The current income loss of owning land however is just that---a current loss while holding an investment---not a loss on farming with that land asset. The stock market investment analogy would be that the dividends earned from a stock are not enough to cover the interest cost (or carrying cost) of owning/holding the stock. However, that is not unusual, and it does not negate the economic wisdom of investing, nor does it imply that the use of assets held by the stock's underlying business operation is unprofitable. There is one last but major piece of the puzzle to consider.

If the only return to land is the current income it can extract from production, or rent, the economic decision to own land, at least in this representative case, is simple. Don't! Land ownership is unprofitable! And the question of whether or not owning land will cash flow is even more simple. It won't! Land ownership will result in negative cash flow. (*Note: this is not the same thing as incorrectly stating that "farming" is unprofitable or that the "farm business" will not cash flow.*) However, the return to land ownership also includes an unrealized capital gain in value. The capital gain component is now more than the amount of current return in the U.S. farmland market, on average twice as much.

With capital gain "income" of $140,000 in this example the net return to land switches to a positive $25,000 above expenses for a respectable ROA of 9.25%. With debt leveraging, the ROE, Return on Equity, is even higher at 13%. The greater economic motivation for owning land is the potential long term increase in value rather than the short term income it can earn. It is to hold land as an investment more than to farm it. Any analysis of the total business should properly reflect this motivation and assign both the costs and income to their proper economic activity and decision point.

The example used in this paper shows a situation where all of the land is owned with a high level of debt on the land. Numerous other examples could be made with varying mixes of the percentage of owned land and different levels of debt. In the case where the land has no debt, for example, a traditional approach where no interest is charged to the farm operation would understate the true cost of production; a debt-free land asset would be subsidizing, numerically, the farm operation, leading to inaccurate production management analysis. In the new approach, debt-free land would not change the farm analysis since it would be charged with a current cash rental rate regardless of the type of financing used on the land. The land investment would show the same ROA whether or not it has debt financing since ROA is not affected by the interest on debt. Thus, a clearer picture can emerge for both the farm business and the land investment business. The same would be true of other examples where the amount of owned land is less than 100% of the land base or where other debt-equity mixtures are in place.

This expanded new approach to farm business analysis more accurately reflects the profitability (and cash flow) of its distinct components. It shows the economics of farm production without the cost burden of a separate and differently motivated decision to own the land, allowing better production management decisions to be made about the farm operation. It highlights and properly assigns to the land investment decision the burden of low returns from farming, allowing better management decisions about investing in farmland, about whether to own or rent. And it reveals the importance of long run as well as short run considerations in evaluating the economic situation of farm operator-owners. For governmental farm policy makers, it could more clearly show where the problems of net income and cash flow truly exist.

Only with the proper identification of the problem(s) can effective policy actions be determined to deal with the economic challenges of the farm sector.
While this analysis has been presented as applicable to U.S. agriculture in particular, it may be equally valid for other countries where the market for farmland includes increasing demands for non-farm use of land and for holding land as an investment. It may also have implications for developing countries, where the value of land is still tied mostly to its current earnings rather than capital gains, but where that may be changing in the future.

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2004 NATIONAL RENEWAL SURVEY: FARM BUSINESS MANAGEMENT PRACTICES OF AGRICULTURAL PRODUCERS

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Abstract

The 2004 National Renewal Survey, undertaken for Agriculture and Agri-Food Canada, provides information on Canadian farmers' knowledge and adoption of various business management practices, use of training, and business and personal goals. The survey was conducted in December 2003 and January 2004. It surveyed 2,112 Canadian producers who were the main decision makers and earned at least $10,000 in gross farm revenues in 2002. Survey information is available on their goal achievement, business plans, financial management, training, and other areas of interest for policy and program development. Information is also available by farm typology (low-income, retirement, lifestyle, or business-focussed), major commodity and region. This survey work is being followed by two types of surveys in 2007. The 2007 National Renewal Survey will measure changes in business practices and training uptake since the 2004 National Renewal Survey. About 2,250 producers from the general farm population will be surveyed. The 2007 Renewal Client Impact Assessment Survey will measure specific program outcomes experienced by Renewal program clients. About 1,050 Renewal clients will be surveyed. This applied paper presents the results of the 2004 survey in greater details and analyzes farm management practices in Canada.

Key words: Farm management practices, Renewal survey

Introduction

Management is an important factor that differentiates one farm from another in terms of profitability. It is skilful management decision-making that empowers farm operators to profitably face numerous opportunities and challenges that have a direct impact on their farm operation. The success of farm businesses depends largely on how well farm operators manage their resources in the face of multiple factors, such as weather, which they cannot control.

Recognizing the importance of management to financial performance and, thus, of empowering more Canadian farmers to apply financial management skills to their long-term and day-to-day decision making, provincial, federal and territorial governments in Canada offer farmers a suite of management products and services. For example, at the national level, the Government of Canada through Agriculture and Agri-Food Canada introduced in 2003/2004 a number of initiatives to help Canadian agricultural producers access skills, knowledge and advice in the field of farm business management. Three of those programs are the Canadian Business Advisory Services (CFBAS) and the Planning and Assessment for Value-Added Enterprises (PAVE), which both provide producers access to consultants for business assessment and planning; and the Canadian Agricultural Skills Service (CASS), which helps participants increase their family income by providing access to skills and knowledge development activities.

To be able to gauge the success of these and other programs, and to fine-tune such programs, benchmarking the level of knowledge and use of management practices by Canadian producers in the early stages of the programs was needed. To that end, AAFC undertook a National Renewal Survey in

2004. The Survey provides information on Canadian farmers' knowledge and adoption of various business management practices and the level of attainment of business and personal goals in 2004. It serves as a baseline benchmark data in order to monitor changes over time and to assess the impact of Renewal initiatives on the adoption of management practices.

Information collected from the 2004 National Renewal Survey is one of the main data sources used for performance target setting and measurement of Renewal's performance indicators, which are the following:

- percentage of producers and farm families who have significant knowledge and understanding of business management practices;
- percentage of producers and farm families who are using business management tools, services, practices, and/or have improved their skills; and
- percentage of producers and farm families who are meeting their business and personal and family goals.

The National Renewal Survey is currently being undertaken again in 2007 and it is anticipated that another survey will be conducted in 2010 to measure the progress in reaching targets.

Methodology

The 2004 National Renewal Survey was conducted in December 2003 and January 2004 by telephone interviews by Environics, a firm contracted by AAFC for that purpose. This report presents the results of the survey based on questions asked to 2,112 Canadian producers. When available, results from other surveys will be presented for comparison and further explanatory purposes. For the purpose of this survey, the following conditions were used to define a qualified respondent:

- the respondent is a farm owner,
- the respondent is one of the main decision makers and also looks after the business side of the farm such as, keeping the books, obtaining loans and paying bills, and
- the respondent earned at least $10,000 in gross farm revenues in 2002.

The actual completion rate was 26 percent based on the number of completed interviews (2,112) divided by the number of qualified respondents contacted directly (8,026).

Once data collection was completed, the results were weighted by province and the main farm production type to reflect the distribution of the producer population reported in the *2001 Census of Agriculture* from Statistics Canada.

The margin of error for a true probability sample of 2,112 is +/- 2.1 percentage points at a confidence level of 95 percent. A margin of error of plus or minus 2.1 percentage points at this confidence level means that there is a 95 percent chance that the responses of the target population as a whole would fall somewhere between 2.1 percentage points more or 2.1 percentage points less than the responses of the sample. Margins of error are larger for regional and other subgroups, varying from a low of 2.1% to a high of 14.6% in the province of Newfoundland and Labrador.

Results

Results of the survey have been summarized at the national level. Detailed statistics are also available by province, farm type and farm typology.

To determine the farm type, respondents were asked which agricultural product produced on their farm contributed the most to their gross farm sales. Results were tabulated for Grain and Oilseed, Cattle, Hog, Dairy and Eggs, and Horticulture.

Factors such as age, experience, business intentions, and sales class have been used to categorize farms into farm typology. The AAFC typology groups are:
- Retirement: farms managed by an operator 60 years of age or older receiving pension income with no children involved in the day-to-day operation of the farm.
- Lifestyle: small farms (revenues of $10,000 to $49,999) managed by families with off-farm income greater than $50,000. This category excludes the retirement category.
- Low income: small and medium farms (revenues of $10,000 to $99,999) managed by families with total income less than $28,000. This category excludes the retirement and lifestyle categories.

All other family farms are separated further, based on total revenues:
- Small business-focussed: Revenues of $10,000 to $49,999
- Medium business-focussed: Revenues of $50,000 to $99,999
- Large business-focussed: Revenues of $100,000 to $499,999
- Very large business-focussed: Revenues of $500,000 and over.

Goal Achievement

Producers were asked to rank their most important business goal and their most important family and personal goal from a pre-selected list of goals established through producer focus groups.

For approximately one-third of survey respondents (31%), "paying off debts" was the most important farm business goal. The second and third most important farm goals were "maximizing return on investment" (26%) and "producing the best products possible" (23%). "Maximizing productivity" was selected by 15% of respondents. Very few respondents (<5%) chose "expanding the farm" as their most important farm business goal.

Two-thirds (64%) of respondents ranked "providing a reasonable income for my family and myself" as their most important personal and family goal. The second and third choices were "providing a good place to raise a family" (20%) and "providing a heritage to the next generation" (11%). "Being part of the community" and "learning new things" were selected each by 2% of the respondents.

A large number of producers reported that they were achieving either their business or family goals:
- almost 51% of Canadian operators reported fully or mostly achieving their top business goal, and a further 36% reported somewhat achieving it, and
- almost 57% of survey respondents stated that they have achieved fully or mostly their top personal and family goal, and a further 32% reported somewhat achieving it.

Plans And Financial Records

In the 2004 National Renewal Survey, responses indicated that 22% of Canadian farm businesses had a written business plan for 2003. This percentage is slightly higher than the percentage reported for Canadian farm businesses in a 2001 survey conducted by Ipsos Reid on the state of farm business management practices in Canada, the United States and Australia. However, the percentage reported for the 2004 National Renewal Survey for Canada is slightly less than the percentage reported in the United States (25%) and Australia (29%) based on the result of the same 2001 survey (*Ipsos-Reid, 2001*).

While not all producers indicated that they have a written business plan for their farm operation, many may have some components of a business plan or other type of plan in place. Some of the elements of a business plan or other type of plans used by the 2004 National Renewal Survey respondents included:

- a financial assessment (52%)
- a production plan (35%)
- an environmental plan (30%)
- a food safety and quality plan (21%)
- a succession plan (18%)
- a marketing plan (18%)

Few operators indicated that they used a risk assessment plan (11%) or a human resource plan (13%).

Although not many producers have a full food safety and quality plan, over half of Canadian producers reported having step-by-step procedures in place to enhance product safety (S*tatistics Canada, 2003 Farm Financial Survey).*

In 2005, the Canadian Federation of Independent Business reported that only 7% of Canadian small and medium sized enterprise owners have a formal succession plan. However, the sooner one expects to exit the business, the more likely that he or she will have a succession plan (*CFIB, June 2005*).

The 2004 National Renewal Survey confirmed that most respondents kept financial records. The most common record kept was the balance sheet with 84% of respondents reporting they have one completed. This compares to 79% in the U.S., 85% in Canada and 86% in Australia in 2001(*Ipsos-Reid, 2001).*

Other types of records kept by Canadian operators are:

- a written annual budget (48%), listing expected revenues and expenses for the farm;
- a break-even analysis (47%), which outlines the minimum revenues needed to cover expenses;
- a cash flow statement (44%), that tells producers when they can expect to get money and when they will spend it; and
- an enterprise budget, which separately calculates the revenues and expenses associated with the various products a farm business produces (40%).

Regionally, there is a higher percentage of producers in Quebec that have plans developed or kept financial records than in other provinces. Quebec government has been encouraging the development of producer management clubs for many years which may account for the higher use of plans and records.

Benchmark Comparison

A total of 52% of survey respondents reported using production benchmarking (comparing their farm's production performance with other farms of similar region, size and specialization). However, fewer farm operators compare the financial performance of their farm with that of other farms, with 34% of Canadian operators having reported using financial benchmarking. Larger farms were more likely to use benchmarking data of either sort.

Innovation

According to the 2004 National Renewal Survey, 60% of producers used a computer for business purposes and 53% of Canadian farm businesses were connected to the Internet. Regionally, Newfoundland and Labrador, and British Columbia have been taken the most advantage of this technology.

Producers use their computer for business purposes to keep financial records (75%), access marketing information (59%), keep production records (51%), do financial planning (43%), do cost of production analysis (38%), purchase inputs via the internet (18%) and market their products via the internet (14%) *(Statistics Canada, 2003 Farm Financial Survey).*

In terms of being connected to the Internet, producers use their connection for accessing marketing information (73%), production information (72%), or weather information (65%); for communicating with suppliers (49%) or with other producers (40%); for making farm related purchases (38%); for banking (37%); for selling farm products (23%); and for investing (23%) (*Ipsos-Reid, 2001).*
When asked about their level of innovation, 22% of the 2004 National Renewal Survey respondents stated that they were "among the first to try something new" when new products and techniques were introduced. A majority of producers said they wait until a few operators have tried the new products and techniques first (44%). About 76% of the producers who stated that they were among the first to try something new have less than $50,000 in net farm income and are over 44 years old.

In the past five years, 65% of survey respondents reported undertaking some new business venture through expanding, diversifying, introducing value-added products, or starting a non-farm business. A total of 48% of producers reported that they had expanded their operations, 31% had diversified their operation, 11% had started a non-farm business, or introduced value-added products in their operation.

Canadian producers are exercising due diligence when it comes to making these changes to their operations. Before making any changes to their operations, survey respondents:

- did an assessment of the impact on net income (86%);
- analyzed the financial feasibility of the project (78%);
- identified a market for a new product (68%);
- consulted an accountant, lender, or other financial expert (61%);
- identified possible conflicts with their farm's limited resources (56%);
- consulted an agrologist, input supplier, or other agricultural specialist (48%);
- consulted other farm operators (47%); and
- analyzed consumer trends (44%).

Networking
Two types of networks were covered in the 2004 National Renewal Survey: farm groups, where members come together to exchange ideas, and collaborative arrangements, where a group of producers make arrangements to reduce costs or increase revenue.

About 47% of Canadian operators actively participated in a producer association or a farm organization. Some operators actively participated in a mentoring or peer group (14%), or a management or marketing club (13%). About 31% of respondents stated that they had a collaborative agreement with other producers in sharing equipment. Other collaborative arrangements included group purchasing (14%) and group marketing (11%).

Marketing

In 2003, 6% Of Survey Respondents Directly Exported Products To Other Countries. Another 16% Of producers sold value-added products.

Statistics' Canada reports that 8% of all small and medium enterprises had revenues from exports, representing about 33% of their total revenues generated *(Statistics Canada, Survey on financing of small and medium enterprises, 2004).*

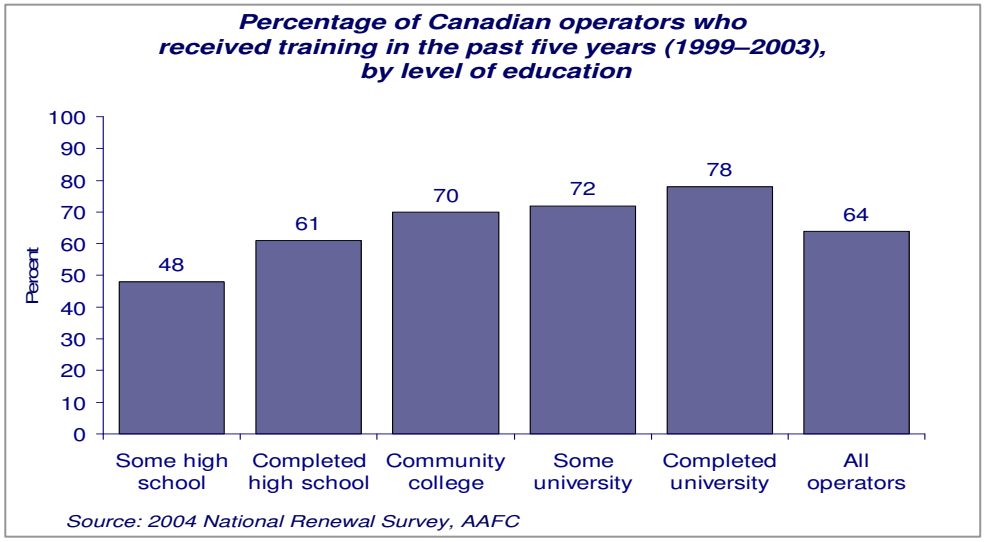
Education And Training

In 2003, 52% of survey respondents reported having completed some form of post-secondary education: 32% had attended community college, and the remaining 20% had attended university. This is similar to the general population aged between 25 and 64 *(Statistics Canada, 2001 Census of Agriculture).*

Ipsos-Reid reported in 2001 that Canadian producers were more likely to have technical or post secondary education (27%) than the producers in Australia (18%) and the U.S. (12%). However, producers in the United States (32%) were significantly more likely than producers in Canada (10%) or Australia (13%) to have a university degree (*Ipsos-Reid, 2001).*

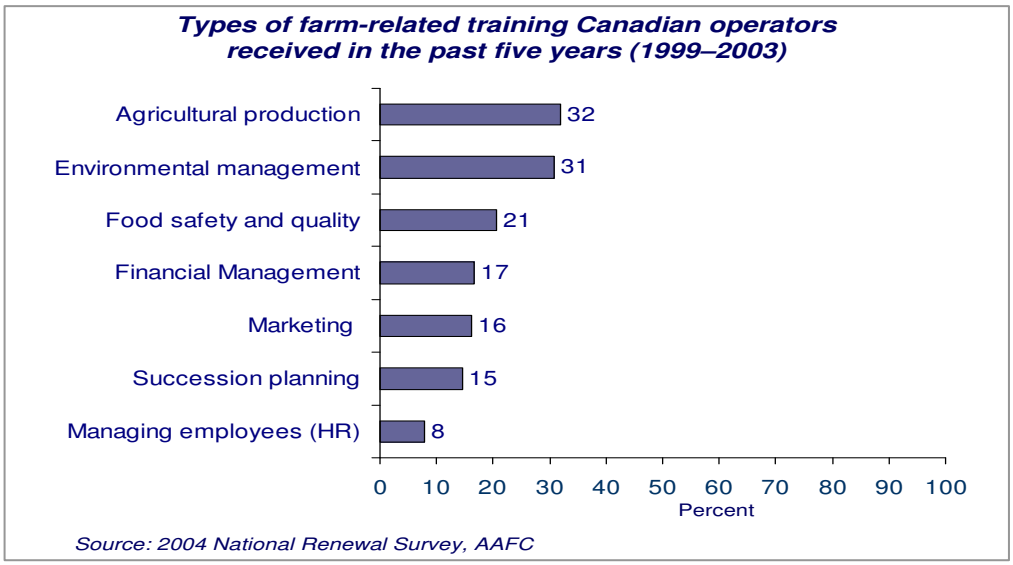
Of the two-thirds of respondents who reported taking training in the past five years, operators with university education were more likely to have done so. Operators with "some high school" education were less likely to have taken training (Figure 1).

Figure 1: Percentage of Canadian operators who received training in the past five years (1999-2003) by level of education



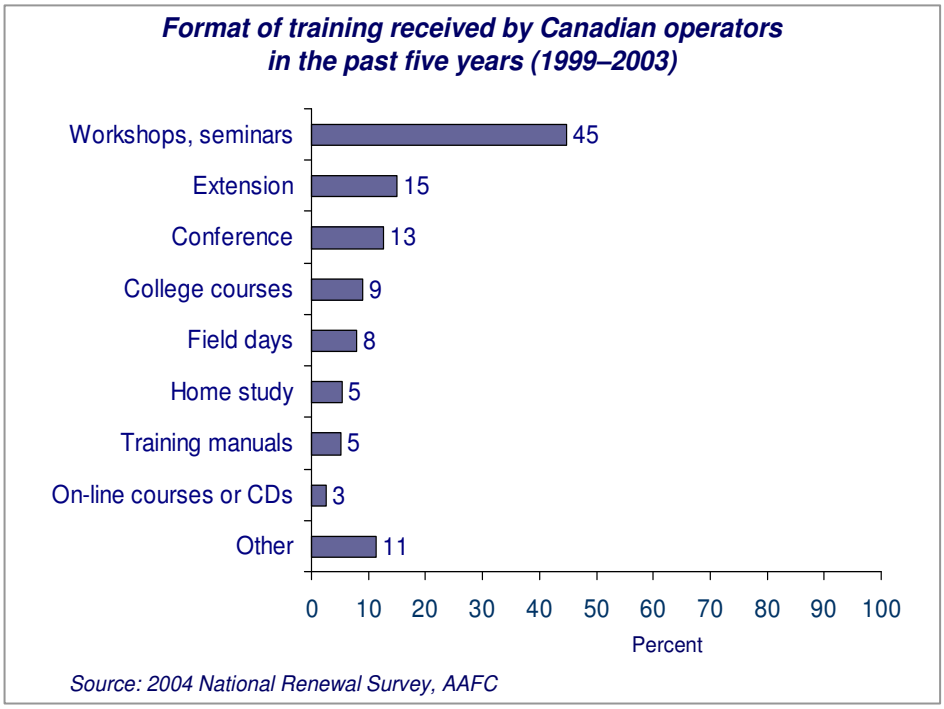
Farm-related training was chosen by 59% of Canadian farm operators, with the most popular course topics being agricultural production, environmental management, and food safety and quality training (Figure 2). Another 21% of Canadian operators took non-farm related training in the past five years.

Figure 2: Types of farm-related training Canadian operators received in the past five years (1999-2003)



As shown in Figure 3, the farm-related training method chosen by most producers was "workshops and seminars", extension courses or short classroom courses following a distant second with 15% of respondents reporting this format of training.

Figure 3: Format of training received by Canadian operators in the past five years (1999-2003)



Over one-third of producers in Canada reported facing challenges taking training to improve skills. Lack of time, cost, length to travel, and lack of replacement labour were cited as major challenges (*Statistics Canada, 2003 Farm Financial Survey).*

Demographics

According to the 2004 National Renewal Survey, the majority of farm businesses in Canada were sole proprietorships. In 2003, one half of farm businesses in Canada were sole proprietorships, one-quarter partnerships and one-fifth corporations. In comparison to businesses in general, Statistics' Canada reports that about 36% of small and medium businesses are sole proprietorships, 11% partnerships and 53% corporations *(Statistics Canada, Survey on Financing of Small and Medium-Sized Enterprises, 2002).*

In the 2004 National Renewal Survey, one-third of farms reported generating gross revenues of $100,000 to $249,999, while slightly over one quarter of farms received $250,000 or more in gross revenues.

Two in five producers specialize in grain and oilseed production. One-third of producers specialize in the production of beef cattle, and one-tenth in dairy production.

Less than 5% of farm operators are younger than 35 years. The average age of farm operators in Canada is 52. In comparison, Statistics' Canada reports that 9% of the majority owner of small and medium-sized enterprises is under 35 years *(Statistics Canada, Survey on Financing of Small and Medium-Sized Enterprises, 2002).*

Almost half of farm operators operated a large farm (revenues of $100,000 to $499,999) and almost one-fifth operated either a small (revenues of $10,000 to $49,999) or very large farm (revenues of $500,000 and over).

Conclusion

Like farm business management practices themselves, federal, provincial and territorial governments supplied or sponsored products and services which must also adapt to changing circumstances and needs to remain effective. To that end, government needs performance indicators against which to measure the success of their programs and services. The 2004 National Renewal Survey provides such benchmark data. Governments in Canada are refining their programs to provide as many farmers as possible with the management tools that they need to increase profitability, to make choices about sources of income, and to meet market and consumer demands respecting not just type of product, but also food safety and the environment. The information provided from the 2004 National Renewal Survey provides policy-makers and program designers of farm management and skills training alike with the base for the measurement tools that they need to gauge the success of current programs in these areas and alter them as required.

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THE SIX NUMBERS THAT SHOW IF YOU'RE MAKING A PROFIT; OR WHY WE NEED TO BE GRATEFUL TO KEN LAY

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Abstract

All farm firms, big or small, must manage four different and often intertwined conflicting parts. These are production, marketing, human relations and finance. It's probably fair to say that in most farms, production is the fun part and finance is the stuff that's left to bookkeepers. This is unfortunate because the financial part of the farm plays a larger role in firm success than ever before. This is largely due to the increasing importance of timeliness in the decision making stemming from the farm's financial performance in an increasingly competitive environment, both domestically and overseas. It is also sad, but typical, that the essential financial numbers tend to arrive back from accountants long after the owners should have acted on them. The main reason on many farms is that accountants tend to concentrate on taxes, while owners should focus on financial management decisions, which usually require different numbers. This paper attempts to clarify the mystery of, and ignorance about, all those essential financial statements, by selecting six simple financial management numbers that are timely, that owners can follow easily and therefore improve both their farm decision making and their competitive advantage. The numbers are subjectively ranked in the authors' views of their importance. These ranked numbers are 1. the firm's ***cash*** *and its availability. Cash pays the bills and is the fuel that drives the farm's finances. 2.* ***net income*** *and how it is used. Net income, or profit, pays for new farm investment, retires principal and provides salaries to the farm's owners. 3.* ***earnings before interest and taxes****, otherwise known as EBIT. This indicates whether the farmer should reduce debt now and therefore lower future interest payments, or invest in a depreciable asset to reduce taxes, or simply accept the number. 4.* ***leverage****, which helps in debt management, and shows how much debt the farm owes for every $1 that it owns. 5. the farm's* ***main cash costs****. There are rarely more than five major expenditures on any farm, and these account for at least 75% of the farm's cash costs, and therefore perhaps 60% of the farm's total costs. 6.* ***sales****, rather than total revenue. Sales provide cash and total revenue may, and often, does not. The paper emphasizes the simplicity of firstly finding these numbers and secondly, using them as trends for decisions. It illustrates the types of decisions in each of the six categories and shows their importance in subsequent firm management.*

Keywords: Finance, decisions, timeliness, cash, profit, costs

Introduction

The late Kenneth Lay, of Enron fame, probably did small business owners and investors like us a favour. We all would rather concentrate on producing things, which we understand, and gloss over the firm's financial numbers, which we usually don't. Mr. Lay illustrated just how dishonest these numbers can be, simply by juggling some of them around and altering and ignoring others. The result was that everyone, including overpaid market experts at banks and brokerage houses, assured us that Enron was doing well when it was doing precisely the reverse. So, if smug experts can be wrong, why should that be reassuring to us?

Simply because it should encourage us to look at some of the numbers a little more critically to see what they really are telling us. The purpose of this paper is to emphasise what we should look at and thus what we might sometimes ignore. For it is fair to say that several of our accountants' numbers are often not that useful to those operating a firm, particularly when we get them nine months or more after we sent the data in. What we do need are quick and easy numbers that show the firm's progress now and from these numbers, whether we are doing things right or wrong now. This gives us time to change directions if we need to. Therefore we probably need to get these numbers ourselves rather than rely solely on experts, sluggish, dishonest or otherwise.

These quick numbers give us a focus and obviate the need to peer vaguely at a plethora of stuff we don't understand. Accountants' numbers are, of course, useful. They fulfil legal requirements, produce coherent, uniform financial statements and handle our tax burdens clearly and concisely. But they, unavoidably, use terminology that occasionally tends to obfuscate rather than clarify firm management. So, often to our detriment, vide Kenneth Lay, we skip over them.

The Basic Indicators

There are certain numbers, which we will call "indicators" here, that tower in importance over the rest. All of them should be considered as they appear in trends. So we would look at the trend rather than the stand alone number. Finally, no one indicator can stand alone as the definitive sign of firm success, if other numbers are bad. I will use simple numbers to illustrate these indicators as they are usually easier to follow than realistic ones.

Cash Indicator

The most important number in the firm is the amount of cash that the firm produces. Cash is to the firm as blood is to the body. It is that simple. We need to emphasise cash and exclude receivables, which are not cash, although they hopefully will be eventually. Agribusiness is notorious in allowing receivables to run far longer than other firms allow. In fact, it is an excellent idea to increase the firm's cash by encouraging early settlement through discounts as most industries do. A fairly common one is to discount the bill 2% if it is settled in 10 days and to impose penalties if it is not settled within 30 days.

Cash does six things or, more properly, shows whether we have enough cash to do all or some of these six things. (1) Cash pays bills, or the payables in accounting parlance. It also pays (2) taxes. It meets (3) debt payments of principal and interest. It also pays (4) owners' salaries, shows whether we can afford to (5) replace used up assets and (6) to expand the firm by investing in new assets that increase the firm's size. It is the single most important indicator of business success. Having cash allows the firm to do things that it could not do otherwise.

Look at the six uses again. They are basically listed in order of necessity. We have to meet payables (1), to stay in business. Likewise we settle taxes (2), to remain legitimate. We can postpone or re-schedule debt (3), if we have to, but will eventually have to pay it off. If there is a cash shortage, owners must reduce their living standard by cutting back on salary (4), something that Mr. Lay was not good at. Similarly, if we don't have much cash we cannot replace assets (5), nor expand by investing in new ones (6). If we do have cash then (3) through (6) can make us all feel good. Thus cash is the number one sign of success.

The amount of cash in a firm is shown as part of the current assets in the latest balance sheet and its future inflows and outflows should be detailed in the firm's cash flow for the next year. But perhaps the simplest way to count it is to keep the check book and savings account up to date and see if this total is similar to what the cash flow shows for that time.

Net Income, Or Earnings

The second basic number is the net income, which also means earnings, or profit. The bigger this is, the better, and the faster it grows, the better the firm is doing. It is found as the bottom line on income statements and is therefore considered as accumulative, which it is. So, if earnings are listed as $100, the conception is that there is $100 available to collect. This is not true. Being accumulative does not mean that it just sits there. Nearly all of it has been allocated to one or more of the three things that earnings are spent on during the time the income statement represents. This is usually a quarter, and most of our earnings have been spent during that quarter, so $100 represents what has been spent *and* what is left over.

Earnings go on (1) principal, (2) re-investing and (3) owners' salaries only. All other expenses have been settled earlier in the income statement. Assume that the $100 earnings are allocated 20% to principal, 40% to re-investing and 40% to owners' salaries respectively. Principal is usually paid monthly so at least two if not all three months' principal has already been met. Therefore most of the $20 has already been spent on paying principal. Owners need living expenses regularly rather than waiting for a lump sum every quarter, so some more of this has also already been spent. Thus most of its $40 allocation is no longer available.

Re-investing is the amount of earnings that are spent on new assets that increase the size of the firm. For example, if we buy a third truck when we only had two before, the firm's size has increased by one truck and this is classified as re-investing. Replacing one truck is not. Buying additional land also is re-investing. So is keeping re-investment money in cash because it increases the amount of cash we have. Thus, with the $40 available, we bought a truck for $10, land for $20 and kept $10 as cash. All three items are re-investing, because the firm grew in size.

The allocation of earnings often separates the good from the poorer manager. It is not easy to do because we have to essentially decide before we know how much profit the firm will earn. But there are a few commonsense guides. The more that goes on one item the less there is available for others. So, we should pay ourselves first and principal last, leaving the remainder for re-investing. It obviously depends on the firm's situation and the ages of the owners, but the allocation portrayed above of 40% to owners, 40% to growth and 20% to principal is often a good guide.

Earnings before Interest and Taxes, or Ebit

EBIT is a useful decision tool. It is found just above the net income line in the income statement. The larger it is the better, and the faster it grows, the nicer for the firm. It shows what the firm has left to pay in interest and taxes before earnings. For example if EBIT is $120, there are $20 available for these two items, before the earnings of $100.

If EBIT seems high then we may decide to pay off our debt faster, i.e. increasing principal payments from earnings, thus reducing future interest charges. Or we could buy a depreciable asset that we need and thus reduce our taxes by the depreciation of that asset. We should emphasise the word "need." It is rarely sensible to buy something that just reduces taxes but is not particularly useful for the firm. Either or both actions will affect subsequent earnings, so see what earnings need to be before taking action.

We also need to know if we are already managing our debts well and realize that if we are paying taxes, we are also making money. So it could be sensible to simply continue with what we were doing, pay the $20 and pass the remaining $100 on to earnings. This is as much of a decision as the two former are. Looking for tax reductions qua reductions only, is usually a poor way to invest.

Leverage

This is an extremely useful and simple tool to check on debt management. It is calculated by dividing the firm's total debt by its equity. Both these numbers are found on the balance sheet. Debt shows what we owe and equity shows what we own. So if the ratio is 2 to 1, this means that we owe $2 for every $1 we own. The actual number will probably depend more on the age of the owners or the firm than anything else, but it is still useful. An increasing trend shows a firm with increasing risk.

We expect that younger folks will have higher leverage ratios than older ones. Young owners usually need relatively large amounts of debt capital to start and run their firms. Older owners generally wish to reduce their debts to perhaps zero. So it would not be a good trend for owners in their sixties to see their leverage increase, while this may be perfectly ok for owners in their 20s. Thus the decision is, what do the owners want it to be? Having decided, they should then monitor their progress to attaining it.

As a generalization today, established agriculturally based firms would not want their leverage to be much above 1. However, in today's volatile markets, one disaster can change this significantly. So, follow leverage regularly. Trends in leverage indicate the firm's debt direction, which should be the same that the owners want it to be. If not, take action. Debt is very much a two edged sword. It rewards you when things go well i.e. when returns are greater than the costs of borrowing money, at, say 12% and 7% respectively. But it will slay you when things reverse e.g. when the costs (6%) outweigh the returns (-5%).

Cash Costs: The Big Five

Cash costs are the costs we pay for with cash. They are by far the majority of practically all firms' costs in both number and percentage of total costs. In a typical agribusiness firm they will account for 75% or more of all the firm's costs. Examples include hired labour wages and FICA, interest, fertilizer, chemicals, fuel, repairs, insurances and licences, seed, feed, rent and other cash expenses. All of them are found in the income statement and in the cash flow. This may seem a rather large bunch of costs to combine together but there are two good managerial reasons for doing so.

The first is simply because we pay cash to settle these items and we have already established the importance of cash for the firm. That's why the cash flow is the most important financial tool for the manager. It shows when cash comes in and when it has to leave the firm. The above items are examples of cash leaving the firm. So we need enough cash at the right time to settle these bills.

The second is that in any agribusiness firm there are probably four or five cash costs that add up to 70% to 80% of the total cash costs. Thus we should focus on these cash costs rather than trying to cover them all equally. For example, row crop farms will probably name fertilizer, chemicals, feed, seed and fuel as their main ones while vegetable growers might select labour, utilities, chemicals and machinery operations as theirs. If we are trying to reduce costs, knowing the main ones and their trends as a percentage of all cash costs, will help our focus. So, if chemical usage grows from 20% to 25% to 30% over a three year span we should either be able to justify its increased importance, or ask why, or think of ways of reducing it.

In summary, cash costs are by far the most important of any firm's costs. There are a few of these costs that dwarf the rest and we should concentrate on these. The easiest way is to express them as a percentage of all the cash costs and track variations in these percentages over time. Look for an explanation before acting. Labour costs and fuel costs have risen for reasons outside our control and, if we are already pretty efficient, there may not be much we can do about them, beyond substitution. For example, introducing mechanical harvesting rather than hand picking, that will reduce labour but increase energy costs.

Sales, Not Total Revenue

If a firm's sales are increasing this is almost always good news. The same cannot be said for total revenue, also known as gross output, although it is commonly utilized as a sign of good news. Both are listed in the firm's income statement. Total revenue is the sum of sales, other firm income, changes in inventory and changes in receivables. Sales normally dominate this entry and in agribusiness firms, they are often 90% of total revenue. But not always and that's where the problem lies. The above changes refer to the difference between the values of the items at the beginning and the end of the quarter. This is the source of the problem and why we must concentrate on sales.

For example, suppose that the income statement shows inventory change over the quarter to be $30. This means that either the value of the existing inventory or the increased amount of inventory, or some of both, increased value by $30. This sum increases total revenue by $30. The same argument applies to receivable changes. Now suppose that there were no sales during the quarter, so that all the production went into unsold inventory. Our total revenue is therefore $30 (assuming no receivable changes or other firm income). If the total revenue from the previous quarter was $20, our revenue has increased by $10 or 50%, which looks like good news, without any help from Ken Lay.

But it is not good news. None of the inventory is sold so we have received no cash for a quarter. Inventory costs will increase and nothing is coming in to meet these increased costs. The scenario is not fanciful, particularly in the ornamental and nursery firms, which, almost by definition, carry inventories that often match their sales. The message is to follow sales, with perhaps a corollary that we should follow inventory accumulations at the same time. Inventory management is not an easy science, especially in a small business. Just realize that inventory does not pay any bills. Sales do.

Conclusion

Financial statements, like balance sheets, income statements, statements of owner equity, proformas and cash flows are very useful statements to report firm performance and anticipate future performance. But there are a few short cuts that can help busy owners keep up with what's been happening in the firm, what should be monitored regularly and, with the cash flow, aid considerably in where the firm may be in the future. These have been discussed above and presented in preferential order. They are cash, earnings, EBIT, leverage, the main cash costs and sales. If we follow these regularly, we shall be sufficiently informed for the majority of our daily operations in running the firm. And this, in most cases in small agribusinesses, is a great change over what normally happens, which is simply operating and marketing and generally neglecting the firm's finances. For an even shorter cut, think and follow cash and we will probably succeed. If Kenneth Lay had, Enron would still be operating today.

ASSISTING PROPERTY OWNERS WITH WEALTH TRANSFERS: ANECDOTAL EXPERIENCES FROM THE UNITED STATES AND NEW ZEALAND

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Abstract

Anecdotal experiences are discussed relative to efforts assisting property owners with wealth transfers. The author draws from his work in the United States and while on sabbatical in New Zealand. Initially focus was given to the technical aspects and details of asset transfer: organizational structures, ownership of assets, percentages of annual transfer through gifts, etc. Experience led to a redirection of emphasis in dealing with property owners. Efforts were redirected to hard issues of economics (can the farm afford succession) and to soft issues of management, such as mission and vision statements, articulation of values by the property owners ultimately leading to establishment of goals and plans. The transition of wealth, consistent with owner plans, is then executed incorporating business plans, gifting, sales, and bequests all sensitive to tax constraints if any. The most difficult issue often times, is the gathering around the kitchen table to begin the discussion.

Keywords: wealth/business transfer, taxation, goals

Introduction

To live cash poor and die land rich is often the case with farmers and other primary producers in the rural sector. Generally, as is well known, land acquisition and subsequent appreciation of land creates the wealth of farm families. As commercial farms in industrially developed countries decline in number, but conversely gain in size and scale, transfers to subsequent generations can be a challenge for these families. This paper discusses change in the methods and focus used by the author in assisting farm families with this process. These anecdotal experiences are gleaned from private meetings with farm families across kitchen tables, to public extension meetings conducted as workshops, to address in a broad fashion the issues of wealth transfers (the family farm in many cases).

This discussion includes the following topics: goal setting, economic reality, business structures, tools used to address these issues. Recent emphasis of the author has focused on the "soft" issues of family wealth transfer as compared to "technical" issues. The author discusses his experiences from the perspective of his professional career as an extension specialist in two Cooperative Extension Services in the United States (Kansas and North Carolina) and a six and one half month sabbatical as a visiting farm advisor in Ashburton, New Zealand.

Workshops begin with asking participants three questions: 1) what is your definition of success, 2) what is your definition of succession, and 3) what motivates you (gets you up in the morning), money or the game of business? Often, these questions begin the task of simply talking, listening and learning between family members either attending a workshop or sitting around the family table.

Goal Setting

The simple overriding goal relating to wealth transfers is that it, the accumulated wealth, "goes to my family". That is simple if one has only one child, and that child desires to continue "the tradition of

family farming or the family business". However, reality is much more difficult. Yes, the encompassing goal, with family business transfer is to keep it in the family, but to or with whom in the family? When the author opens the topic of succession planning three general questions are asked. First, what is success; as defined by the participants? A working definition of success, being the root from which the word succession is taken, is necessary for the participants to focus as a beginning to goal setting. Overwhelmingly, in New Zealand (10 locations) and in the United States (8 locations in North Carolina) the author observed that participants listed family values as primary indicators of success. Time with family, to experience family events, to participate in activities of children either at school or extra curricular events such as athletic competition, camping or religious activity was ranked consistently in the top two to three categories. Yes, business success can "afford" the flexibility to allow for these enjoyments. Articulation of financial success was generally rated number five or six on lists created in descending order of importance. This is consistent with results of employee surveys that rank employee satisfaction or motivational inputs where salary or compensation is ranked sixth. The importance of goals, preferably written, allows for the planning, implementation and control of family business activities so that the business owner's definition of success, generally inclusive of family, can be attained.

Formalized goal setting can be difficult; a tool used to formalize the process can aid in the recognition of important issues in the wealth (business) transfer process. Such a tool is illustrated below. The goal setting acronym SMART: where **S** represents **specific**; **M** represents **measurable**; **A** represents **attainable**; **R** represents **rewarding**; and **T** represents **timed,** helps focus the process (author unknown). Other practitioners of farm consultancy use other like words when using this acronym. Articulation of a goal using this methodology may look something like this:

Specific (I want to purchase family farm land)
Measurable (I want to purchase the 100 acre Moore Farm)
Attainable (I can purchase this farm with a 35% down)
Rewarding (Buying "grand dad's" old home place)
Timed (I want to close by September 15, 2007)

Each member of the family, involved in the firm or not, may influence any ultimate outcome of transition planning. It is important for all parties to recognize their individual goals, even if difficult to articulate, in this wealth or business transfer process. For the patriarch, commonly the driving force of family businesses, is there a view point change that needs to be addressed? Namely is there a sense of "being put out to pasture" or is there a recognition of movement to a new phase of life; either being a mentor to the successor(s) or a curmudgeon? For the matriarch, has her family life been one of "nurturing the children" and being "family peacemaker" versus being an esteemed business partner? For the supposed successor(s) is this viewed as an offered opportunity or an entitlement? For non-successor family members is the transfer of family business wealth [possibly disproportionately to successor(s)] viewed with honest recognition of contribution to the past growth of the firm or with envy? Lastly, for this discussion, what about the spouses of the successor generation; are their perspectives received as *bona fide* family members or not included in this process? Attention, therefore, to the permutation of family inputs should lead wise family business owners/managers to be aware of the complexity of the human dynamic of the wealth transition process. Articulation of goals, business and family, should be paramount in the beginning of the process of wealth transition. Operators of these businesses must balance many objectives in the successful transition of accumulated wealth: retirement cash flow, equitable wealth transfer to desired recipients, business successor(s) with sufficient resources to have a chance at success, and a host of other issues.

For family business owners one of the most difficult decisions to be addressed and ultimately made is asset distribution to heirs. This decision must include who gets what; when they get it; and finally, how do they get it. It is the author's observation that this question is the most difficult because of the emotional component often drives objectivity out of the window. Workshops have enjoyed a measure of

success in bringing light to the difficult questions families must address. Observations of workshop participant groups indicate that questions can be raised in the supported environment of others dealing with the same or similar issues. After discussion of the emotional topics a transition is made to the feasibility topic: what is the affordability of the present business enterprise regarding wealth transfer or succession?

Can the Family Business/Farm Firm Afford a Successor?

Importantly, when addressing the family objective of continuity of the family business, the issue of affordability, or more pointedly, the economic reality of successful family wealth (business) transfers must come into play. Increasingly, in production agriculture, business owners must address the question, are they the managers of a commodity production unit within the context of a the "national farm" (Lisa Jack, NCSU guest lecture March 29, 2007), or, are they entrepreneurial mangers within the primary production sector striving to differentiate their products produced for either market niches or niche markets. The family business/farm must continue to be profitable and sustain the families that it supports. As parents live longer, the demands on cash flow are increased if there are no off-farm income sources such as social security payments, equity investments or pensions. David Kohl, Virginia Tech professor emeritus, indicates that businesses in the primary sector must plan to grow five to six percent per year for business sustainability. If the firm's income is to support more than one generation, the growth factor may indeed need to be higher to allow for continuing success. Therefore, analysis of firm profitability and capital structure can provide fundamental groundwork in the success of wealth (business) transfers. This analysis can be performed by the accounting/tax professional engaged by the firm. Further, use of production and economic benchmarks by various categories: scale, farm business type, capital, etc. can provide family business owners with direction as to feasibility of the transfer. Likewise, the successor to the farm business can begin to chart the path of success as they see it with the resources that are available to yield the profit necessary to afford the transition. Obviously, if the elder generation has made off-farm investments and thereby has an income stream to fund its retirement needs, chances of the success of wealth transfer is heightened. The author observed this to be the case in both the United States and in New Zealand.

Tax Considerations and Business Structures

Both the United States and New Zealand have their law rooted in English Common Law. The expression and practice of each country's national law and state laws for the United States differs by cultural and structural construct of their respective jurisdictions. Each country has laws governing taxation policy and business ownership; however New Zealand's tax laws are wealth-transfer friendly.

The author observed that in New Zealand, tax laws made wealth (business) transfers easier to accommodate family goals of business succession. Namely, New Zealand does not have a capital gains tax and presently, by statute, the estate tax rate is zero. (NZ Inland Revenue) Therefore, parents wishing to "cash up" can sell the family business to the successor generation with little to no tax cost. Upon death, if cash remains in the decedent's estate, it can be transferred to beneficiaries with little to no transfer cost as well. (NZ Inland Revenue) The absence of these two taxes allow for New Zealand family-owned businesses to be "offensive", relative to business succession and for providing income to the former business operators.

In contrast, the United States taxes capital gains as income but at a preferential capital gains tax rates. Presently 15 percent is the maximum marginal tax rate on capital gains. (Internal Revenue Service) Farm businesses selling depreciable capital goods such as tractors must recapture any depreciation taken in prior years at ordinary income tax rates, the maximum rate of which is 35 percent. (Internal Revenue

Service) Further, the United States has an estate tax (wealth transfer) of 45 percent for estates which have assets valued greater than US $2,000,000. In the United States estates of US $2 million or less do not pay federal estate tax, though some estates may pay estate or inheritance tax to the revenue or taxation department of the individual State in which the decedent lived. These two tax issues are important to farm business managers in the United States as they must be "defensive" in their wealth transfer strategies. Frequently, for many farm business owners, these two taxes establish a large disincentive to wealth transfers and can require large cash outlays by the decedent's estate to pay these taxes upon transfer. Regardless, plans should be developed by business owners for this taxing potential as part of the wealth transfer process. Ultimately then, for farm business owners in the United States, the tax consequence of wealth transfer will occupy a greater role than for their counterparts in New Zealand as plans are developed.

Business ownership structures used in the two counties are similar. Nuances exist relative to application and legal construction that may have operational implications for preferred ownership structures between the two countries. But for the purpose of this discussion, the structures used in both countries are flexible tools for wealth transfer. Fractional ownership can be transferred to the successor(s) with transfers of family-corporation stock shares or ownership interests of limited liability companies or partnerships. Business continuity, an assumed family goal, can be facilitated by partial transfer of ownership interests over time. However, the use of gifts as part of a transfer process is available in both countries but expressed differently.

In the United States an annual gift exclusion of US $12,000 per donee is available to use as a business ownership transfer mechanism. In practice, the Internal Revenue Service allows a discount for minority interest and non-marketability of closely held companies ranging from 20 to 38 percent from the interest's fair market value. (Internal Revenue Service) Business owners with a relatively long planning horizon may transfer US farm businesses to accomplish family goals.

In contrast, New Zealand has a total gift limit of NZ $54,000 (2005) per year. Donors may choose to gift this amount to one or several donees. Similar to the United States, business owners with longer planning horizons can transfer wealth to successors. The major difference between the two countries gifting allowances is that in the United States gifts of an annual tax free amount can be made to unlimited donees, while in New Zealand there is an annual total amount that can be gifted to a donee(s). For owners of businesses the task of planning for the transfer of business wealth must in some way address any tax consequences of the transfer process. These tax issues often become psychological obstacles bringing the transfer process to a crawl or full stop.

Workshop Tool: A Case Farm for Small Group Discussion

Use of a case farm is a successful way for large and small groups to address the issues of goals, which family member gets what, how, and when balanced by economic reality and tax considerations of wealth transfer. The use of a case study in the farming context allows for participants to identify with a common issue, wealth transfer of family businesses, but in a not threatening and personal way (disclosure of personal financial data). The case study can be constructed with "red herrings" for highlighting issues that may occur in family businesses or to force recognition of "life events" that demand non-traditional plans, such as a child born late in life and the only one that truly desires to be the successor farmer, but is to young to carry on when parents want or need to exit farming. An example of such a case farm is included in the appendix to this paper.

As a part of the workshop in which wealth transfer of farm businesses is the focus, the case farm tool is used to discover strategies that can be explored by the participants in the workshop with their own personal plans. In the following sections the author discusses observations relative to the workings of the

small groups. When conducting these workshops, the author splits the attendees into small groups of no more than 6 persons. Further, these groups are segregated to separate family members so that each person is able to express personal opinions without familial influence. Additionally, when possible, the author segregates participants by sex, attempting to have at least one female-only small group. After a group discussion period, each group reported to the entire workshop the group's suggestions and observations of the case farm. Obviously groups often reported the same or similar suggestions to succession and wealth transfer issues. However, each group would typically identify a unique discussion point.

Male Participants

The point of the exercise was to come to some conclusion or group consensus formulating a plan for succession based on the given facts in the case farm. Observations made of the small group dynamics, in which male participants were either the entire population or majority of the group; indicate that the males try to "farm" themselves into a solution or out of the perceived problem. The males were driven by their drive to produce product. To be fair, a few groups both in New Zealand and the United States did investigate and pose ideas utilizing the capital resources as a means to continue to generate income through passive means such as rents or restructuring the asset portfolio to include off-farm opportunities to generate income. Overwhelmingly, the males exhibited sharper financial analysis skills across all groups. New Zealand participants seemingly were more willing to exploit off-farm business opportunity ideas (using farm-based equity) than their counterparts in the United States. The proposed solutions coming from the male groups did recognize the difficulty of the process, but the males generally left themselves in the picture of "running the business", thereby deferring action on succession.

Female Participants

At four of 18 workshops, two each in New Zealand and the United States, sufficient numbers of participants were female to allow for female-only groups. Observing these groups produced an interesting contrast with the all male or male dominant groups. First the females tended to follow more closely the charge of the activity to seek succession strategies relative to wealth transfer in the case farm. Second, the women were more apt to define "fair" as equal, but struggled with the concept of "fair" as it related to the case farm scenario. Small female groups vocalized this difficulty to the entire workshop group; the men likewise concurred, but did not spend as much time on this issue in their small groups. Third, the author observed that in three of the four female only groups, understanding of financial statements, basic business operations planning, and estate and wealth transfer issues was greatly lacking. These observations raised questions regarding intra-family communications and transfer of knowledge: business, production or otherwise among spouses or partners. Since women generally outlive men this lack of understanding by the likely surviving spouse or partner may have grave consequences for successful business and wealth transfers in the rural sector.

Summary

The purpose of these extension workshops was to assist or prod participants into beginning the process to think about, discuss and formulate or review personal plans toward successful wealth/business transfers. The case farm is a useful tool to help participants, male and female, to recognize issues similar to their own circumstances, without disclosure, and begin the conversation. Men, driven by their production work ethic, attempted to produce the case farm out of the perceived problem solvable by more profit. Women tended to express solutions that were nurture focused, as being equal in distribution of wealth to heirs, regardless of the business implication. An observation of the female groups indicated that understanding of business analysis and production practice was lacking on the part of female participants. If this observation is indeed true, then future extension work needs to be developed to assist with broader understanding of these topics.

The overall goal, to bring owners and operators and their spouse or partners of rural and farm businesses together to discuss and explore transfer of wealth/business issues was accomplished. Several participants left with knowledge confirming already established plans, or, those that needed to begin the process left with lines of communication open, but knowing that conversation must continue for ultimate success.

Appendix: Case Farm Example

Case Farm: Dusty and Bumpy Furrow

Dusty (51) and Bumpy (48) have three children: James (25), Jennifer (23) and Timothy (14). Dusty and Bumpy have been in contact with their farm advisor about doing a farm succession/transition plan. They provide information (see supplement) from which to make a frame work for the decision making process.

James is entering medical school and has no interest in the farm. Jennifer is interested in farming as she is a recent graduate of an Eastern State University, but is in a budding relationship with a Californian who lives on a cotton farm in the southeastern part of California. Tim is really keen on farming in his father's footsteps. Dusty and Bumpy are in somewhat of a quandary.

Family living expenses:	$65,000 per year
Life Insurance:	$15,000 per year
Annual family car capital cost:	$8,500
Aid to James in med school:	$10,000
Aid to Jennifer	$5,000

Dusty and Bumpy remember the struggles that the family had when Dusty's father died unexpectedly in a bar room brawl (he was truly an innocent bystander as he was asking for directions…). Dusty had to buy out his siblings and only in recent years has had the means to develop the farm. Dusty feels that he was taken advantage of and doesn't want that to happen with his children. Bumpy wants to treat all the kids equally. Dusty is not so sure seeing some issues can not be resolved, but recognizes a plan needs to be in place. At 51 years of age, Dusty does not want to be on the farm every day as he currently is doing, he and Bumpy want to be able to take planned holidays.

They have come to seek advice as to options they should consider.

Farm Financial and Production Factors
NC Crop Farm Example: Dusty Furrow

YEARS

Physical Production Factors	1	2	3	4	5
Farm Area (acres)	1766	1766	1766	2150	2150
Effective Farm Area (acres)	1,501	1,501	1,501	1,850	1,850
Cattle: head	98	98	98	115	115
Crop area: acres	1,370	1,370	1,370	1,685	1,685

Financial Factors	1	2	3	4	5
Cotton Income	$154,852	$138,936	$164,350	$158,560	$185,625
Corn Income	$53,394	$44,777	$38,659	$51,503	$42,367
Cattle Income	$34,096	$38,965	$45,975	$69,850	$77,625
Wheat Income	$15,685	$10,768	$18,680	$24,350	$27,680
Soybean Income	$36,785	$39,757	$42,568	$61,536	$72,652
Other Income	$4,377	$5,369	$3,726	$5,782	$5,354
Gross Farm Income (GFI)	$299,189	$278,572	$313,958	$371,581	$411,303
Farm Working Expenses (FWE)	$171,658	$165,373	$193,894	$246,070	$258,750
EBIT (Excluding Depreciation) (Earnings before Interest and Taxes)	$127,531	$113,199	$120,064	$125,511	$152,553
Fertilizer & Lime/a	$72.48	$114.97	$169.60	$43.97	$292.24
R & M /a	$26.24	$41.80	$49.00	$56.45	$44.52
Animal health/head	$4.56	$4.36	$3.77	$3.96	$4.47
GFI/a	$199.33	$185.59	$209.17	$200.85	$222.33
FWE/a	$114.36	$110.18	$129.18	$133.01	$139.86
EBIT/a	$84.96	$75.42	$79.99	$67.84	$82.46
Cotton GI/ total acre	$113.03	$101.41	$119.96	$94.10	$110.16
Corn GI/total acres	$38.97	$32.68	$28.22	$30.57	$25.14
Cattle GI/total acres	$24.89	$28.44	$33.56	$41.45	$46.07
Wheat GI/total acres	$11.45	$7.86	$13.64	$14.45	$16.43
Soybean GI/total acres	$26.85	$29.02	$31.07	$36.52	$43.12
Other Income / total acres	$3.19	$3.92	$2.72	$3.43	$3.18

Depreciation averages $17,000 per year

Balance Sheet

Land: 1112 a at $2,150/a		$2,390,000
Equipment:		$250,000
Irrigation:		$250,000
Livestock:		$105,000
	Total Assets	$2,995,000
Non-Current Debt		$950,000
Overdraft (Operating loan)		$50,000
	Total Liabilities	$1,000,000
	Equity Position	$1,995,000

LABOUR PRODUCTIVITY IN SOUTH AFRICA

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Abstract
Research shows that worker output is not a constant and that labour productivity is internationally an important component of agricultural production. Labour productivity plays a prominent role in creating the competitiveness of a specific farming business and even the whole economy. This situation became a concern for farmers as the pressure to increase minimum wages escalated in recent times. In 2006, the South African Government announced a total increase in wages of 34, 59% over a three year period (2006–2008). It is basically impossible to increase productivity of labour to the same extent over this period. This paper examines labour productivity, the influence of increasing labour costs on profitability and sustainability, as well as how farmers must take this issue into account when production planning is done.

Keywords: Labour productivity, minimum wages, profitability, competitiveness

Introduction

This paper focuses on the improvement of labour productivity to the same percentage that minimum wages are increasing. It also focuses on how to improve worker productivity. Kendrick (1993) defines productivity as the ratio of output to inputs of labour and other resources, in real terms. This means to increase productivity output grows faster than the increase in inputs used in the production process (Kendrick, 1993). Labour productivity must increase according to the extent of the competitiveness of a farming business measured against that of other farming businesses of the same enterprises. In other words, if R1,00 is spent on labour input, it must generate more than R1,00 worth of output (Nell, 2007).

The problem in South Africa is that at the beginning of 2006 the Minister of Labour, Mr Membathisi Mdladlana, announced an increase of 34,59% in minimum wages to be implemented over a three year period. The increase in minimum wages in the country will have far-reaching effects on the profitability, competitiveness and sustainability of commercial agriculture, and specifically emerging agriculture. It is basically impossible to increase labour productivity to the same extent as the percentage that minimum wages has to be increased over this period. This increase in minimum wages will force the farmer to consider mechanisation in order to be sustainable. Mechanisation means more time for management and less time for things to go wrong. It will especially have a big influence on labour-intensive farms, such as cash crop, vegetable, fruit and vineyard farming, of which the product prices are under pressure in real terms (Nell, 2007).

Globally the remuneration of labour is supposed to be based on the productivity of labour. This means the income generated with every rand spent on labour. When this ratio becomes too high, it has a negative effect on the profitability of a farming business, with accompanying long-term financial difficulties. The

long-term financial difficulties will result in a disadvantage on competitiveness to other similar farming businesses (Nell, 2007).

Approach Methods of Measurement

As farmers strive towards world-class performance and face rapid change, the traditional methods of measuring labour productivity become a hindrance (Maskell, 1994). These methods no longer apply; they measure the wrong aspects of labour productivity (Nell & Napier, 2005). Farming businesses need a new approach to performance measurement. The traditional methods of measuring labour productivity refer to the following:

- Labour productivity can be measured by unit output obtained from unit input of labour. Many businesses, however, use this method for the measuring of labour efficiency (Pratten, 1976). The term *labour productivity* is reserved for measurement of output per unit of labour input (Pratten, 1976).
- Julia Kedrova (2004) measured labour productivity in the relative amount of output to hours of labour input. The output of production can be subdivided in different segments to productivity or efficiency of labour. In practice, farming businesses compare output and productivity in diverse ways, though these measures only provide approximate indicators of the real differences in labour productivity.
- Some businesses measure output in terms of the units produced per worker or per worker hour (Pratten, 1976). For example, a small stock farmer calculates the kilogram meat produced per worker per hectare or per production period.
- Some farming businesses only estimate direct production worker hours required for the manufacturing of the products (Pratten, 1976). For example, a grain farmer that calculates the number of workers needed for planting one hectare a day, and the number of hectares that must be planted in a specific time.
- The majority of the methods used, measure labour productivity in relation to the production cost (Pratten, 1976).

This paper focuses on measuring productivity to the income that is being generated by the input spent on labour. This means the income generated by every rand spent on labour. It is transformed to a percentage of the total gross production value (GPV) of the enterprise. This ratio must be within certain limits. When this ratio trend becomes too high, it has a negative effect on the profitability of the farming business, with accompanying long-term financial difficulties.

These ratios (labour cost as percentage of GPV) have been informally researched by Nell and Napier (2005) for different types of farming businesses in the important agricultural countries (Australia, Brazil, Canada, Europe, New Zealand, South Africa and the USA), and these ratios are applicable to all these countries. These ratios are presented in Table 1:

Table 1: Norms for Labour Cost Ratios

Type of farming business	Labour cost: farming income
Livestock farming businesses	6 – 8%
Cash-crop farming businesses	8 – 10%
Irrigation and other labour intensive farming businesses	10 – 15%
Dairy farming businesses	10 – 11%

Source: Nell & Napier (2005).

Studies that have been done by Nell and Napier (2005) over 30 years showed that if the ratio is higher that the above norms, the farming business can aspect to experience financial difficulties, but when the

labour cost ratio is within the above norms, the business's financial position can be improved over time.

When looking at the labour cost ratio in South Africa, the rand:dollar exchange rate has a big influence on the profitability of the farming business. For example, if the rand:dollar exchange rate improves, most of the businesses outside agriculture that produce for the export market, will either retrench workers or start with a four- or three-day workweek. This cannot be done in agriculture; because if a four- or three-day workweek is instated, it can lead to major losses because farming businesses need to operate continually.

The question can now be asked what effect the increase of minimum wages in South Africa will have on the labour cost ratio. If the example of a mixed farming business (50% livestock and 50% cash crop) is used and different price levels of products are used, it will have the following effect on the labour cost ratio as illustrated in Table 2.

Table 2: Effect on Labour Ratios

Price levels of maize, soybeans & wheat[1] (R/ton – farm price)	Labour cost ratio before the 12,63% increment of 2006	Labour cost ratio after the 12,63% increment of 2006	Labour cost ratio after the 11,75% increment of 2007	Labour cost ratio after the 10,21% increment of 2008
1 100, 2 000, 1 600	9	11	12	13
850, 1 450, 1 400	11	12	14	15
600, 1 350, 1 300	12	14	16	17

Source: Nell (2007)

1 Maize is used as main crop, but the price of soybeans and wheat is adjusted accordingly. Sheep and beef prices are kept constant at levels of R14,00/kg for lamb en R13,00/kg for weaners.

It is clear form the example above that the increase of minimum wages will have a big influence on the profitability of a farming business. This kind of influence on the profitability will force the farmer to invest more into mechanisation to employ less labour if they want to stay sustainable.
What is the effect of minimum wages on labour intensive businesses (vegetables, fruit and vineyards) over the next three years if the price levels stay at the levels of early 2006? The effect is shown in Table 3, with the exchange rate remaining the same as at the beginning of 2006.

Table 3: The Effect of Labour Cost on Labour Intensive Businesses

Ex-change rate	Labour cost ratio before the 12,63% increment of 2006	Labour cost ratio after the 12,63% increment of 2006	Labour cost ratio after the 11,75% increment of 2007	Labour cost ratio after the 10,21% increment of 2008
R6,80:$	28%	32%	35%	39%

Source: Ferrandi (2006)

This example is based on a tablegrape farm situated in the Northern Cape Province of South Africa. Every labour intensive farm (vegetables, fruit and vineyards) will experience the same effect on the labour cost ratio. From the example above, it means that these farming businesses spend about a third of their total income on labour cost, and at the end of 2008 it will be close to 40% due to the increase announced by the South Africa government. There is no farming business that will survive these circumstances if the business is not going to increase labour productivity by the same percentage. Most of

the labour intensive farmers are making more and more use of seasonal labour to combat this trend of uneconomical wage increases.

After looking at the influence that labour cost has on profitability and sustainability, it is clear that labour in a farming business must be productive to generate more value than every rand that is spent on labour. Labour productivity must increase according to the extent of the competitiveness of a farming business, measured against that of other farming businesses with the same enterprises. In other words, if R1,00 is spent on labour input, it must generate more than R1,00 worth of outputs (Nell, 2007). Labour cost contributes only to a percentage of the total production cost ratio of an enterprise. The total cost ratio can be divided in different components, for example, labour cost, fuel cost, feed cost, medicine cost and other miscellaneous costs.

Improvement of Labour Productivity

There are different methods to improve the productivity of the workforce to maintain a competitive advantage in production. The skills required to improve productivity are much simpler than people think. The main phrase is "time is money", and money can make things happen. Businesses always speculate on how to earn more, save more, manage it better and how to get more value out of the money that they invest. The phrase "time is money" refers to the fact that businesses should be more efficient with labour time in order to spend their labour money more efficiently.

The motivation of workers comes down to one thing: it is about the money that each worker expects to be paid for a day's work. On the one hand, the farmer wants to spend less on labour cost, but on the other hand, he expects from their labourers to be more productive. When an increase in minimum wages is forced down on farmers such as the minimum wages announced by the South African government in 2006, the only solution is that productivity must be increased by the same percentage as the minimum wage has increased.

Example 1

The first example is based on a vineyard farmer in the Northern Cape Province of South Africa producing raisins. The farmer, Ms Coetzee, managed to improve the productivity of her labour during harvesting, as she managed to do the same work later in the harvesting season with less workers than at the beginning (Personal communication, 12 April 2007).

During the first season of involvement in the production of raisins, Ms Coetzee employed 40 workers to do the harvesting (23 in the vineyard, 5 tractor drivers, 5 at the dipping tray and 7 at the drying trays). These workers harvested five tons (or 125 kg per labourer) of grapes on the first day. The norm for all vineyard farms in the area is ± 600kg per labourer per day. When she calculated the labour cost ratio, she realised that she would experience a financial crisis as this labour cost ratio was much too high. She then decided to do an observation of the workers in the vineyard to identify the unproductive workers. At the end of the first day she dismissed 20 of the workers that have not worked efficiently during her observation period. She dismissed 9 that work in the vineyard, 2 of the tractor drivers, 4 at the drying trays and 5 workers at the dipping tray, because the tractor drivers are now doing the work at the dipping trays.

The next day the remaining 20 workers (14 in the vineyard, 3 tractor drivers and 3 at the drying trays) harvested seven tons of grapes per hectare. By dismissing the unproductive workers, she inspired the others to work harder, bringing the fact to them that if they were not doing their work efficiently, they may lose their jobs. She, however, saw that her labour cost ratio was still too high. The workers were observed again and it was noticed that they walked too far for drinking water during the day, so she decided to supply them with cold water in the morning and again later during the day in the vineyards. It

was also noticed that the workers were wasting a lot of time by smoking during working hours. The workers were not allowed any more to smoke during working hours. During her observation she also noticed that there were some workers that harvested more crates per day than the others. By the observation a movement study was done on the most productive worker. The walking distance of the workers were then structured such a way that the minimum distance be covered in the vineyards to accomplish more work in less time. After three days, another eight workers were dismissed from the vineyard and only 12 workers (6 in the vineyard, 3 tractor drivers and 3 at the drying trays) were used for the rest of the harvesting season. They were now also paid per crate harvested per day. These 12 workers harvested between six and 10 tons per day or 500 to 833 kg per labourer per day. This means that the farmer managed to improve labour productivity by between 400% and 666%.

This approach can only work with high quality control. The farmer must know her or his business by heart and know where a control system can be side-stepped by workers, because when workers have side-stepped a control system once, they will always do so and improve on it. If the farmer pays them by the number of crates harvested per day, there must be a system in place to control it and also that the crates are full. The example farmer has structured her own controlling system for the farming business that works the best.

Ms Coetzee also allowed the workers to become more part of the business. After each day's work she let them calculate how much they must be paid for the day's work. She also asked them what they have learned and whether everything was still in order. At the end of the day she compared her wages to what they have said they must be paid. By paying the workers per crate they could decide what they want to be paid by the end of each day. Many of them could see by Wednesday that they were not going to make their targets for the week, so they had to work harder for the rest of the week. She also subtracted money from their wages if they did not reach their target for each day that she has set according to an hour's observation of each worker's ability. So every worker must achieve his or her target to be paid enough at the end of the day. This keeps the productivity of each worker on a higher level.

Influence on the Financial Part

Uncontrolled labour cost that is not within the set ratios that as given in Table 1 can put pressure on the financial position of the farming business over time. It is necessary that the farmer does not have too many workers for the work that has to be done. That is why it is important that the farm manager does a labour planning for every enterprise of the farm. This planning will help the farm manager to see whether there are too many or too little workers for the work to be done. A labour and kilowatt planning for your farming business can be obtained on the website: www.ufs.ac.za/agriman.

Example 2

The second example explains how a too high labour cost ratio influenced a sheep farmer over a period of 10 years. This farmer's labour cost ratio was too high (12%) and ran into a financial problem. The farm consists of 7 000 Merino sheep which was kept on different farms over an area of 90 km. The farms were big enough to be managed by one worker each. The problem was that the workers did not want to stay alone on a farm with his family. This forced the farmer to employ two workers on every farm, but there were not enough work for both of the workers. This caused that the labour cost was 12% of GPV instead of 6%, an over-spending of R60 000 per year, which gives an amount of ±R1,5 million (future value) at 15% interest compounded over 10 years. This continuous cash flow problem on the farm's cheque account caused that the bank started to return the farmer's cheques. The situation was rectified by means of a restructuring of the land. The farmer had half of the labourers retrenched and after four years the cheque account was running within the limit set by the bank.

From this example one can see the influence of over-spending of the labour costs on the finances of a farming business. Every percent that the labour cost ratio is too high, is a percent off the profit that is over-spent on labour because of productivity that is too low.

Conclusions

Labour cost is not supposed to exceed the prescribed percentages in Table 1. Otherwise it is taking some of the farming business's profit and after some time the business will encounter financial problems. It is very important that the farmer works out his labour productivity so that it can be seen on which days the productivity is lower. All of these things can only be achieved if the control system of the farming business is in place. Control is the most important factor to improve labour productivity. Every aspect of the worker's activities must be controlled, namely his or her needs for accomplishing the work, the workplace and understanding between worker and the employer. Then, finally, the productivity must be calculated in terms of expressing labour cost as percentage of GPV and not as percentage of total inputs. In other words, if R1,00 is spent on labour input, it must generate more than R1,00 worth of outputs.

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VIBRANT AGRICULTURAL MANAGEMENT MESSAGES FROM AFRICA

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Abstract

Sub-Saharan Africans are often frustrated by bad news emanating from their continent, including mismanagement stories and prognoses of agricultural failure. While acknowledging the huge challenges facing Africa, this Paper (widely illustrated from several African countries) seeks to identify key factors involved in a range of agricultural management practices and contextual realities which are actually successful and offer further potential. Innovative and sustainable management practices are pursued in Africa with vigour in many places, affecting soils, crops and animals through mixed cropping, conservation farming, groupwork, multiprofessionality, part-time farming, use of mobile telephones in farm produce marketing and various strategies for food security through strengthening local Food Chains.

Keywords: Africa, sustainability ,management

Introduction

Too often, Africa is perceived as a target for management messages rather than a source of them. However, in addressing 'the challenge for balance' in the quest for 'a vibrant rural economy' this Paper argues that Africa has much to teach us. Africa's Economy has a long and distinguished history (Batchelor, 1993; Hugon, 2004) predating much of that in Europe, despite the substantial blot on both records of slave trading, officially abolished two centuries ago (1807) by the British parliament. It remains a huge challenge that 32 of earth's 37 poorest nations are in Africa.

Mebrahtu (1984) recognised the need to learn from Africa and compiled evidence of positive lessons from Africa, including those from agriculture (Wibberley, 1984). Based on their agricultural experience in Africa, Joy & Wibberley (1979) compiled lessons drawn from African agriculture, Omara-Ojungu (1992) described wider rural resource management, while Gwaivangmin & Wibberley (2004) presented a case for agrarian advocacy in sub-Saharan Africa. Real progress is not equated with growth and materialism but with stability and sustainability achieved by equitable management of natural resources from generation to generation (Tevera & Moyo, 2000). Examples to show that such progress is attainable exist throughout sub-Saharan Africa and some of them are presented here to illustrate the management messages they convey. An accompanying 'powerpoint' presentation provides visual evidence.

Biodiversity, Energy-Efficiency & Integrity of African Farm-Household Systems

Experience of the author in the 1970s in West and East Africa showed the importance of mixed cropping as a risk-reducing, biodiversity-encouraging strategy of tropical farmers. It indicated that sustainability from intercropping favoured in Nigeria (Norman, 1974; Okigbo & Greenland, 1976; Joy & Wibberley, 1979) conflicts with the tendency towards monocultures favoured for simplicity of analysis by development agronomists – as previously noted by Masefield (1949).

Farmers' stated management reasons for adopting mixed cropping are various but include:-

- better use of the soil environment – water, rooting and multi-storey aerial space
- reducing negative factors – weeds, pests, diseases - through biodiversity
- soil protection against erosion by leaf canopy cover and root-binding activity
- complementarity – e.g. legume N-fixing, shade provision, positive root exudate effects
- better return on labour by shared cultivations, less weeding need
- more dependable returns from season to season than from sole cropping
- extended supply period for perishable foods
- obtaining a crop while long-term crops establish e.g. *taungya* (vegetables in young teak)
- provision of a site for minor crops which would be vulnerable in pure stands.

No or low cost disciplined management of crops also plays a vital role. Data from field trials conducted in 1975/6 in Northern Nigeria on *Sorghum* with and without weeding, showed the impact of proper weeding management coupled with the adoption of an improved variety; the local tall variety (*Farafara*) showed a 74% response to weeding three times, while the improved dwarf variety (Short *Kaura*) gave a 38% response to proper weeding and gave a 13% better yield with weeding than did *Farafara*.

Referring to the Kano close-settled zone of Northern Nigeria more than a century ago, Morel (1911) wisely commented "the fields themselves are protected from incursions of sheep and goats by tall, neat fencing of guinea-corn [*Sorghum*] stalks, or reeds, kept in place by rope of uncommon strength … Equally astonishing are the irrigated farms … on the banks of water courses … plots marked out with mathematical precision … divided by ridges with frequent gaps permitting of a free influx of water from the central channel, at the opening of which, fixed in a raised [bird-scaring] platform, a long pole, with a calabash tied on the end of it, is lowered into the water and its contents afterwards poured into the trench … conditions … technique … and industry displayed by the farmers of one district vary a good deal from the next. In the northern parts of Zaria and in Kano, the science of agriculture has attained remarkable development. ***There is little we can teach the Kano farmer. There is much we can learn from him*** [emphasis mine] … every scrap of fertilising substance is husbanded by this expert and industrious agricultural people. Instead of wasting money … 'teaching modern methods' – a deluded notion – to the northern Nigerian farmer, we should be better employed endeavouring to find an answer to the puzzling question of how it is that land which for centuries has been yielding enormous crops … can continue doing so. What is wanted is an expert ***agriculturist who will start out not to teach but to learn***; who will study for a period of , say, five years the highly complicated and scientific methods of [indigenous] agriculture, and base possible improvements and suggestions, may be for labour-saving appliances, upon real knowledge." King (1910) drew similar conclusions in the Far East. Mortimore (2005) confirms contemporary wisdom among other dryland farmers in West Africa. Farmers are likely to learn new techniques when they see them in practice on other similarly resourced farms rather than on abundantly equipped research stations.

Survival capabilities are astounding among nomadic pastoralists in the vulnerable environments of Turkana & Karapokot in NW Kenya. Respect for farmer survival & communal solidarity grows with increasing appreciation of the supremacy of wisdom over literacy for survival.

Energy-efficiency is perceived to be a key factor for sustainable farming systems – and exemplified by those found in the Tropics, including Africa (Rappaport, 1971). African Sustainable farming systems justify analysis, promotion and improvement rather than being jettisoned and replaced by high input dependent, high-risk 'imported' systems.

Farmers Together: Mutually Strategic Management

African societies think and act communally much more naturally than do those of Western nations (western Europe and North America) and yet it is the literature and thinking of western nations that dominates world media. However, '*The pot starts boiling from the bottom*' (Ibo proverb, Nigeria). Village ecological & farmer surveys were conducted in Benue and Plateau States of Nigeria during the mid-1970s as a prelude to work among farmers and a book resulted (Joy & Wibberley, 1979). A survey of 145 farmers in Benue and Plateau States by the present writer in 1975/6 revealed that farmers co-operated considerably:- 73% in harvesting, 69% in planting, 57% in buying, 55% in selling and only 9% not at all. The top aspiration of these farmers was to produce enough food to sell some, or at least to achieve complete family food security – and two-thirds of them practised mixed cropping. Direct experience in well over 50 countries now shows that farmers everywhere prefer to learn from other farmers – ideally from those similarly placed as to soil, climate, land size and market opportunities, but evidently managing their resources better than most farmers. The care and consequent appearance of landscapes is principally the result of farming activity – much of it good and capable of emulation by other farmers if encouraged.

Southern African work of the author during the 1980s confirmed the crucial role of farmer motivation and group work benefits – and the greater propensity to work communally for mutual benefit which is more characteristic of African than of European rural cultures. Extension education via Farm-Households and the perception of the Farm as a Farm-Household System is still mirrored more evidently in African small-scale agrarian structure than in Europe, Australia and North America (FAO, 1989; Moris, 1991).

More concern on equity issues in extension/agricultural development has emerged. Also of growing importance are participatory, farmer-interactive approaches in local problem-solving & extension – such as the ***FARMS*** (Farm Asset Resource Management Study) Groups long advocated and catalysed by the author for over 30 years (e.g. Wibberley, 1995,1999). Many African farmers have faced the challenge of livelihood survival in recent years and need to assess all their farms' assets as potential resources for improved management in order to gain a sustainable livelihood. In Africa as elsewhere, it appears that farmers prefer to learn from other farmers (practitioners of any kind prefer to learn from other practitioners). Therefore, on-farm study together in a practically-focused, farmer-led group with a farmer-chosen agenda provides suitable opportunity for this and for trust to grow. Without trust, any sort of collaborative business co-operation cannot work. Such future collaboration may be in the interests of group members but farmers themselves must decide if this is to be so *after* they have come to know and trust each other - which occurs most naturally during learning together. Farmers who learn together may decide to earn together. From reciprocal trust, other mutually beneficial co-operation may arise later, such as buying inputs, sharing equipment or selling outputs together.

The Africa Co-operative Action Trust (ACAT – www.acatkzn.co.za) began in South Africa in 1979. ACAT provides training and a means of setting up Savings Clubs among farmers within which they also learn and share improved management practices. Over 4000 of these have been set up across South Africa and Swaziland. They have led to a host of other development initiatives in rural communities –including shared processing and selling of agricultural produce based on mutual trust developed through group work in the Savings Clubs. ACAT has improved resource management by emphasising sustainable agriculture, the crucial role of enterprise and the community-building value of engendering mutual interdependence.

Conservation Farming (CF): The Case of Zimbabwe & Zambia

Conservation Farming (CF) is variously described as reduced cultivations, minimal tillage, zero tillage or no-till. These refer to the principle characteristic of the system. Briefly, it also involves early planting at the onset of the rains, disciplined spacing, correct depth of planting, careful nutrient placement (compost

manure or fertiliser) and regular weeding. According to ACT (2003) CF has three chief characteristics, which describe the main features recognised for centuries by wise African farmers as crucial to survival, viz. the simultaneous practice of:-

a) minimal soil disturbance; b) permanent soil cover; c) crop rotations/associations.

Oldreive (1993) developed it both on a mechanised field scale and for small-scale hoe farmers in Zimbabwe, where it has proven successful on all but the sandiest of soils. Its recent uptake in Zambia, catalysed by Zimbabwean experience, has been dramatic (Haggblade & Tembo, 2003) since it has been encouraged there by both the Ministry of Agriculture and the National Farmers' Union (CFU, 2003). Keys to CF success in Zambia are that it is practical farmer led with a motivated extension team, adequate fertiliser is used to get good yields (Wibberley, 2006a), adaptive technology is introduced, biodiversity is fostered and farmer-to-farmer adoption is encouraged – already some 15% of all farmers are adopting some CF for maize, cotton and other crops. There is ongoing endorsement from the Zambia National Farmers' Union and the Government of Zambia. In particular, they have kept their focus on agronomic management and extension (liaising with other organisations regarding storage, marketing and nutrition issues).

In the Genetic Modified (GM) organisms debate *pros* and *cons*, Zambia has declared its intention to remain GM-free (Rees, 2006)[1], while other countries such as neighbouring Malawi have announced their intention to pursue GM biotechnology.[2] A key issue is corporate control of GM seeds and other organisms and the loss of farmer flexibility and independence. The case for and against GM crops is briefly summarised by Wibberley (2007).

The Baobab: Africa's Symbolic Multi-Purpose Tree – A Case Study Inspired in Tanzania

Indigenous African species are often underutilised, and neglected by western agriculturalists. Among animals, the guinea fowl and the ostrich are relatively unfarmed, while among plants both *Artemisia* and Baobab offer largely untapped potential. Trees are particularly strategic for multiple uses in African villages (McNamara & Morse, 2004). African farmers have used their own creatures imaginatively over centuries, as shown by a brief review of the Baobab inspired by field studies mostly in Tanzania.

The French name for the Baobab is '*L'arbre de mille ans*' (the tree of a thousand years). It is indeed reckoned that the Baobab (*Adansonia digitata* of the Family *Bombacaceae* with cousins including both Kapok and Balsa trees) can live for1000 years or more - perhaps as long as 3000 years. Being fire-resistant, Baobabs remain as relict trees after bush fires. The Baobab has other names reflecting its many uses, such as 'Monkey Bread' and 'Indian Cork'; in Arabic it is *Tebeldi,* in Hausa *it is Kuka* and in Kiswahili, *Mbuyu.* It is symbolic - perhaps notably when called 'the upside-down tree' and in many ways parallels the Biblical tree description (Gen.2:9) being both 'pleasant to the eyes and good for food'.

Baobabs thrive in seasonally dry areas throughout sub-Saharan Africa from sea-level up to around 1250 metres. Though drought-hardy, they prefer well-drained soils of high water table. Their appearance when mature is unmistakeable with a wide girth - up to 9m diameter - and squat appearance (only 12-20m tall), having the branches bare for up to 9 months of the year and spreading to give the impression that they are roots heading skywards instead of groundwards; hence 'the upside-down tree'. It does not grow steadily from year to year and can even shrink, which probably accounts for its adaptation to seasonal drought and to areas with high coefficients of variation in annual rainfall.

[1] It is also of interest in the context of IFMA16 in Cork that Ireland also declared some 1,000 GM free areas in 2005.

[2] Reuters, 14th December 2004 on Zambian biosafety legislation; Malawi Formulates National Biotechnology Policy Rebecca Chimjeka, *African News Dimension* 16.8.'06.

The typically 5-leaflet compound palmate leaves when young are cooked as a tender vegetable, as are young shoots, which are vitamin and protein rich. Elephants eat whole saplings of up to 3 years old. The large (around 12cm diameter) creamy white flowers provide bee forage and the tree is commonly used as a place to suspend both traditional and improved beehives. Especially at nightfall, they also attract pollinating fruit bats through their rather sickly-smelling nectar. The mature flowers are eaten by livestock, notably goats. The large yellow-green to brownish, velvet-coated fruits hang on stalks. They are used for human consumption; the dry pinkish-white pulp around the hard acid seeds is rich in vitamin C and tastes rather like slightly soapy sherbet. The seeds are ground to add to stews; they also serve as raising agents for bread-making, probably owing to yeasts living in association with them. A thirst-quenching, syrupy juice is also expressed from the fruit. There are some 100 seeds of about 1cm size each per fruit, which weigh out at around 1500-2500 per kilogram. Seeds are very tough-coated and of poor germination capacity. Seeds can be harvested around September/October in East Africa, light ones floated off and those remaining should be scarified and soaked in water for 24 hours prior to planting. Saplings should grow to around 2m in 2 years. Many seeds are wasted, but good farm household management results in them being planted in raised beds to grow as leafy shoot vegetables.

The wide trunk is described as 'pachycaulous', having low density and thus very soft timber unsuited as fuelwood but with potential for pulping to make coarse paper or to use as mulch with the leaves or as livestock bedding prior to compost-making. The trunk holds water well, especially when young, and it is easily hollowed out to make water pipes, gutters, water-storage containers, trays/platters, floats, canoes, carved craft items and even dwellings. House, school, prison, post-office, latrine and meeting room for worship are among the recorded purposes of Baobab trunk-rooms after hollowing out! The bark can be up to 10cm thick and has a useful cork underlayer. The bark fibre is used to make sturdy ropes, baskets, strings for local musical instruments and lines for snares, or it is woven into bark-cloth from which waterproof hats and other useful and craft items are made. The bark is harvested in panels over a number of years and, if well managed, this process does not kill the tree. Together with the roots, the bark is also a source of medicines and dyes. The wood yields gums and resins. It is an important shade tree, planted by farmers to mark land divisions. In short, apart from being an ornamental symbol of Africa, the Baobab is thoroughly useful. Traditionally, creative African rural resource management has been applied in the case of this tree but knowledge of its comprehensive uses is being lost in the wake of ‘progress’ which urges specialisation in monocropped commodity crops.

Resource Management & Food Security in Africa: The Case of Malawi

Respect is merited for farmers as resource managers and for the key role of farmer-interactive extension in Africa (Wibberley, 1999). ‘Food Security’ is a challenge for management and a relative rather than an absolute concept (Devereux & Maxwell, 2001). Food Security is about each person having more rather than less of their food locally available, accessible, affordable, and avoiding undue risks and unnecessary waste in getting it from land to mouth. It is not about eliminating trade, but it is about optimising locally grown food products everywhere. ‘Food Sovereignty’ (Windfuhr & Jonsén, 2005) is about each nation having greater control over its own food policies in order to enable such food security to be attained as a key in national and international security. Malawi has a challenge to ‘tame hunger’ (Kanyama-Phiri, 2005). Excellent work has been done to connect food and nutrition in Malawi by Stacia Nordin and published under the World Food Programme (Nordin, 2005).

Attaining Food Security requires a comprehensive management strategy involving appropriate technology as recommended for Malawi (Wibberley, 2006b)[3]:

1. More ***FARMS*** (***F***arm ***A***sset ***R***esource ***M***anagement ***S***tudy) Groups, locally-owned

[3] Also, Wibberley, E.J. (2005) Globalisation, Farming & Food Security: addressing the challenges. Paper for Public Lecture, Malawi – given at the British Council, Lilongwe & Bunda College, UNIMA (September, 10 pp.)

2. Model **Primary Schools** with farms using locally appropriate technologies can be crucial
3. Support College, University & **Extension/Advisory links** with Communities/Schools[4]
4. Consider training/supporting '**Key Farmer Trainers**' for Schools/Communities
5. Support short **field workshops** to catalyse improved existing **resource management**
6. Support national construction of village **dams, springs & roof-water catchment tanks**
7. Encourage village/community shared **treadle pumps** to dry-season garden
8. Support the extension of **appropriate-scale replicates** of existing good practice
9. Support the extension of the '**Starter Pack**'[5] project until other improvements are there
10. Support survey, research and development of '**Conservation Farming**' as in Zambia
11. Promote local processing (esp. **solar drying**) and improved household **storage** of foods
12. Support the further development of '***Switch***' cards for secure food trading
13. Support the development of **mobile telephone masts** for better **food pricing 'infonet'**
14. Support **Radio listening groups** in communities for sharing of food security experience
15. Support subsidised (but NOT free) tree/plant seedling/seed **banks** e.g. *Moringa*, *Artemisia*
16. Support media-driven household **2-tree planting campaign** (1 fruit + 1 fodder/fuel-wood)
17. Dig shallower (but beware high W-T) **pit-latrines** & subsequent planting/care of banana
18. Support **compost-making** training, including use of human urine to enrich it
19. Support the use of **natural pesticides,** and of plants for medicinal/veterinary purposes[6]
20. Properly **house goats, pigs & poultry** (link to feed-rationing, better breeding, compost)
21. Encourage the use of **draft animals** for cultivations and haulage of farm goods
22. Promote locally-made termite-mound clay **fuel-efficient stoves** to at least double heat capture
23. **Add value** to farm produce :- solar-dry; juice fruits; make sauce, jam, cakes/biscuits, yoghurt
24. Promote **household hygiene** with plate-drying racks and use of tip-taps
25. Promote **bee-keeping** with trees and other attractive crops
26. Promote best kept farm, household and village **competitions**, with polythene litter removal
27. Encourage formation of **'Junior Conservation Societies'** for environmental management
28. Encourage **fish pond** construction to diversify diets and to save pressure on lakes & ocean[7]
29. Encourage **environmental monitoring and maintenance** groups in communities
30. Promote good resource management/information via **church demonstration compounds**.

Apart from Malawi, food security and environmental management issues have been addressed in Africa by the author and colleagues – together with catalysing *FARMS* groups - including, Ghana, Nigeria, Kenya, Uganda, Tanzania, Zambia, Zimbabwe and Sierra Leone (Wibberley, 2004).

A Southern Nigerian Case Study

Nigeria, as Africa's largest oil-producer and most populous nation has exerted some pressure to maintain rather more control over its own agricultural policies than some smaller WTO members have been able to muster. However, its 'food security crop' (Babaleye, 1996) cassava is now not only used as fuel to cook imported far Eastern Rice in some villages but also is apparently the focus of biofuel planning on quite a large scale. There is an obvious moral dilemma of generating large scale fuel for automobiles – as in Brazil and increasingly elsewhere - rather than food for the hungry from cassava (*Manihot utilissima*). Policy needs to be adjusted to accommodate this concern (Umeh & Asogwa, 2005). Meanwhile, small farmers continue to leave their farms (Oduyoye, 1973) but others, such as Dr Mike Oye of Oshogbo in Osun State, develop integral resource management strategies on their farms and disseminate them to

[4] Kanyama-Phiri,G. (2005) Taming Hunger: the answer is in the soil. 9th inaugural lecture, UNIMA, Malawi 58pp.
[5] Levy, S. – ed. (2005) *Starter Packs: a strategy to fight hunger in developing countries?* (CABI publishing, Wallingford, UK, 295 pp.)
[6] See Hirt, H-M & M'Pia, B. (2001) *Natural Medicine in the Tropics* (ANAMED, 158 pp.) www.anamed.org
[7] Clover, C. (2005) The End of the Line: how overfishing is changing the world & what we eat. (Ebury Press, London, UK, 314 pp.).

others (Fig.1). Nigerian farmers can conduct worthwhile on-farm experiments (McNamara & Morse, 1996).

Fig 1. '**CAMP AGGAMMAL**' symbolises for RURCON Chairman Dr Mike Oye the integral use of readily available resources for sustainable tropical farming to stem hunger, as follows:-

C*rotalaria* (sunn hemp) a marvellous legume cover crop to alternate with cereals and other crops.
Ash - to add to compost, poultry feeds and use as protectant dip over planted yam segments
M*oringa oleifera* - tree makes good live fence, leaf/pod vegetables, root powder spice, oil seeds
P*ueraria* - cover crop which also gives good seed yield when grown on a supporting trellis
A*cacia - A. albida (Faidherbia)* intercrop 100 legume trees/ha + maize/sorghum for <300 kgN/ha
Granite dust – nutrient source for compost and poultry rations
G*liricidia* - N-fixing 'mother of cocoa' tree; live fence, termite resistant, durable, fuel-wood tree
A*zadirachta* - neem tree; multiple uses timber, fodder, de-wormer, insect-repellent pesticide
Mulch - crop residues to protect soil from moisture loss & to suppress weed establishment
Manure (FYM) - to replenish soil nutrients and to add to compost
A*geratum* - goatweed; natural pesticide and parasite-deterrent source
L*eucaena* - valuable, fast-growing legume fodder, shade and fuel-wood tree; it coppices well.

Enterprise Management, Private Extension & Training : A Case Study from Ghana

During the 1970s, Ghanaian farmer Tom Ahima worked in the north of the country promoting the use of draft oxen among farmers (Ahima & Ogborn, 1995). Since 1978, he has developed his own farm as the Ofuman Agricultural Project – for which he gained the first National Best Farmer Award in 1987, and many awards since. A key enterprise has been egg plants (aubergines, *Solanum melongena*). Ahima's wife Agnes collected some aubergine seeds in northern Ghana and tried them at Ofuman in Brong Ahafo district in 1978. Since then, they have grown three crops per year, two largely rain-fed and one irrigated. They have shared their knowledge of egg plants with neighbouring farmers via voluntary private extension work and by now around 1000 small-scale farmers have formed their own independent co-operative to grow and market the egg plants to Kumasi and other towns. Not only is diet greatly improved in the dry season but so is farmers' morale and confidence in their own management abilities. Ahima has also set up a network of some 250 out-growers of seed maize and contributed to the National Food Security programme through these strategic management arrangements. Primary cultivation work is shared among the members giving some of the smaller seed maize growers access to tractors at the strategic stage for early cultivations before the onset of the rains. Concerned by the lack of managerial confidence of agricultural graduates in Ghana which deters them from starting farming, Ahima has also set up a Graduate Farmer Training Scheme at Ofuman to mentor a new generation of farmers. The integration of enterprise, extension and training overcomes some of the constraints in managing agricultural extension described by Amalu (1998) and is a good example of the servant leadership advocated by another Ghanaian (Osei-Mensah, 1990).

Farm Livelihood Impacts of Improved Management : A Ugandan Case Study

Uganda as a nation has adopted an enterprise culture during the past two decades, the first of which was reviewed by Museveni (1997). Uganda's present population of around 26.7 million is projected to rise to some 93 million by 2050. Thus, sustainable natural resource management will be crucial in the context of Uganda's currently strong agrarian structure of many small farms. Uganda faces the classic tension between the temptation to go for large-scale businesses for short term gain against the wisdom of maintaining as many farmers as sensibly possible. Better resource management at Farm-Household level

is the key both to the feasibility and to the desire of people to stay farming and caring for their rural landscapes.

Kinengyere-Mango & Wibberley (2006) reported their independent impact evaluation of Send-A-Cow Uganda work among 122 farmers in two farmers' associations - AWA in Masaka District and BMW in Iganga District. Adoption of improved **farming techniques** e.g. zero-grazing, collecting urine and manure, making compost, using natural pesticides, was over 75% for almost all new techniques, resulting in better yields of crops and vegetables. This led to improvements in **nutrition and health** of farm families. Impacts on **households** and **livelihoods** included key home improvements such as latrines and kitchens. Food storage losses have reduced greatly. Incorporation of improved animals, (cows or goats) into the farming system, combined with adoption of new farming techniques, has resulted in some increase in the ability to save. The range of farm products for sale has improved. Many women reported feeling richer, and some reported buying better clothing or a bicycle.

Learning together has resulted in farmers adopting on average between 3 and 4 new farming techniques, and 65% to 85% of farmers now find it easier to share and learn from other farmers. Farmers reported being very empowered, and nearly all said that they have started, or continue to pray about their farming. Most women and men are now working together better. Women have greatly increased their influence and feel their status is noticeably higher. Fuel-efficient stoves have been adopted by over 75% of farmers, and tree-planting has increased also protecting the **environment**. Over 75% of households hold responsibilities in **community** organisations demonstrating their capacity to get involved in civil society. Members of f**armer groups** value their groups very highly; the main impacts of membership are the ability to seek advice, to network, and to visit other farmers, thus improving their own Farm-Household management.

The ***Kulika*** **Uganda Trust** led by Elijah Kyamuwendo has promoted sustainable agriculture and encouraged farmers' study groups in Uganda. Hundreds of such groups have been formed by farmers, leading to various collaborative enterprises. Some Ugandan farmers are using often wasted crops – such as surplus mangoes and tomatoes - then exporting items such as solar-dried organic mangoes and tomatoes, thus significantly adding value to their produce.

Conserving & Building Local Food Chains In Africa: A Case Study in The Gambia

Connecting and building Food Chains is critical: 'local food is miles better everywhere' (Lang & Heasman, 2004; Wibberley, 2004). The importance and common sense of seeking local produce is particularly obvious in the case of fresh fruit and vegetables, where there is currently considerable scope for improvement in the Food Chain linkages (van der Stichele, *et al*, 2006).

Concern Universal, a UK-based international NGO works in several countries, including The Gambia. Among its projects there is 'Gambia is Good' (GIG). The management abilities of Gambian farmers and the capacity of soils there to grow vegetables and fruits are recognised by GIG. However, farmers'management can beneficially respond to the reality of high dependence upon tourism within the Gambian economy (it forms the leading component within 'service industries' which account for some 52% of Gambia's GDP). This means that farmers require particular logistical and technical management strategies to provide the consistency of supply and of quality demanded by the hotel trade. At present, many vegetables and fruits are imported in bulk via Europe, at unsustainably high environmental and human cost. Substituting local produce requires new management skills. These are being shared in a pioneering partnership with fruit and vegetable farmers from the UK, led by Angus Davison of *Haygrove*, based in Herefordshire. Gambian farmers and hoteliers are responding with alacrity to the developing local food chain initiative and it is anticipated that this will also influence policy with other foods, including poultry products, and be extended to other consumers – such as those in the public sector in

government ministries, schools, hospitals and prisons. Adama Bah, who has led many initiatives in responsible tourism within Gambia, is actively involved in managing the development of GIG.

Climate Change & African Agricultural Management

Global warming is perhaps the biggest challenge facing the world, and there is an imperative to treat the earth as an interdependent whole living system (Lovelock, 2006). Global temperatures will probably rise by between 1.1°C and 6.4°C by the year 2100. For Sierra Leone, for example, the rise will probably be 3.0-3.5°C. Rainfall belts are moving further northwards and southwards from regions like the Sahel and within southern Africa, making droughts more likely. *The Africa Commission* (2005 – Penguin, 184 pp.) proposed three main 'pillars' for action:- a) debt cancellation, b) action on global climate change and then, c) a trading 'free-for-all'! This last point is unsustainable for farming and inimical to counteracting adverse climate change. Furthermore, land misuse – mainly deforestation – is estimated to account for some 18% of global greenhouse gas emissions (UK Report of Sir Nicholas Stern, December 2006). Mortimore and Manvell (2006) assert – based on an analysis of 105 UK DFID-funded Renewable Natural Resources Research Strategy projects - that climate change threatens the livelihoods of many poor people. Helping poor people to adapt (through research on adaptive crop cultivars, appropriate technologies, strategies and institutions) is imperative, they argue. The Kyoto protocols of 1997 provide an international management framework to guide practical responses towards mitigating negative effects of climate change, to which Africa is also required to respond (Ogunseitan, 2003). International agriculturally-related management is vital.

Discussion & Conclusions

Globalisation impacts the sustainability of African agriculture in both positive and negative ways. A positive arises from the fact that Africa leads the world in growth of mobile telephone ownership in view of the general shortage of land-lines. The use of mobile telephones in farm produce marketing can be strategic in several ways. Firstly, in accessing countrywide market prices to reduce inappropriate, distorting differentials. Secondly, in conjunction with account *Switch* cards, in enabling credit to be accrued into bank accounts without the use of cash. This allows women to receive money directly and use it for the benefit of their children whereas some men may waste it on excessive alcohol. Negatives arise from the fact that there is international upheaval of labour, capital and produce of the land in relatively unregulated movements, coupled with farmer losses on an unprecedented scale. NEPAD (the New Partnership for African Development) offers various opportunities to promote progress (Evbuomwan, 2004).

Trading: The WTO (World Trade Organisation) policy encourages non-discrimination against imports with consequent unregulated movement of agricultural staple products to countries where they can perfectly well grow locally. This has negative impacts in Africa and raises questions of ethics and equity in itself, as well as through the commoditisation of agricultural products. For example, when any crop or animal product is reduced to the status of a commodity, least cost methods of producing it can be more easily legitimised in common thinking. This can lead to compromising soil conservation, jeopardising animal welfare, improper workforce treatment and damaging the environment through excessive movement of goods and people – harming both the origin and the destination of such produce in various ways. Some sort of *Highway Code* framework for agricultural trading is imperative to set boundaries regulating the excessive movement, especially of staple foods (Wibberley, 2005).

Agrarian advocacy for sub-Saharan Africa, as proposed by Gwaivangmin & Wibberley (2004) involves arguing the ***integral*** case for:-

- sustainable farm livelihoods

- natural resource conservation and management
- food security, and
- land heritage (the recognition, celebration and care of 'entrusted place').

From policy-makers to grass-roots farming communities, such advocacy is needed. There are links between agrarian advocacy and:-

- environmental protection
- community and individual health
- reconciliation and the avoidance of conflict, including resource-wars
- national security in an increasingly volatile world.

The delivery of a sustainable system of agriculture in sub-Saharan Africa requires the simultaneous implementation of the following:-

- Farmers in place, conserved and respected as **professional managers** with means to retain them and to value their **multiprofessionality,** including respecting part-time farming;
- **Good Agricultural & Environmental Management Practice** – sound husbandry, as it used to be called - for biodiversity, equity and long-term environmental care;
- Trading ***Highway Code*** protocols in place to provide a **management framework** within which viable livelihoods can be sustainably pursued internationally for food security (Wibberley, 2005);
- Mobilising Civil Society consumers to value local food and their own food cultures more such that they support food sovereignty in principle and by their purchasing practice. This requires better **management of public relations** by farmers to persuade consumers of its importance.

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CAP REFORM POLICY ALTERNATIVES AND FARM DECISIONS' OPTIMIZATION - THE CASE OF SLOVENIA

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Abstract

The 2003 reform of Common agricultural policy to be implemented in Slovenia in 2007 could have significant impact on the economic position of some agricultural sectors in Slovenia. Out of economics sight one can expect a drastic impact especially in sectors like beef, where percentage of pre-reform production coupled direct payments was very high - up to 70 % of gross margin achieved. This leads farmers to seek new production plans. For this purpose detailed specified static linear programming model has been developed and applied to the hypothetical agricultural holdings in order to find optimal production plans by maximizing total gross margins. Model results confirm that the reform should have unfavourable impacts on farms with intensive production practice, especially those with high livestock density. Obtained results indicate that the negative impacts can be mitigated by combining different production activities and technologies under given constraints on resources available. Model results also confirm the growing importance of CAP rural development payments, among them particularly inclusion into agri-environmental measures.

Keywords: CAP reform, farm decision making process, linear programming, Slovenia

Introduction

Direct payments are an important element of Common agricultural policy (CAP) which could significantly influence decision making process at the farm level. After accession to European Union direct payments became one of the most important income sources for farmers also in Slovenia (Volk *et al.*, 2006). Economic conditions are relatively similar with old member states, since in pre-accession period Slovenia introduced CAP like agricultural policy and consequently results of pre-accession negotiations allowed progressively providing funds from national budget to the level of old member states reached in 2007. After accession the policy changed significantly in 2007 as result of the implementation of 2003 CAP direct payments reform. Second pillar payments under CAP are becoming more important.

Changing environment leads farmers to make new decisions about which sector to choose, what to produce and by which technology. There exist many techniques of decision making that could help farmers to solve such problems (Boehlje and Eidman, 1984). One of them is undoubtedly linear programming that basis on mathematic techniques for solving optimization problems. Linear programming models and optimization techniques have also been successfully used in recent years for estimation of potential impact (on different levels) in changing agricultural policy. Majewski and Was (2005) exposed some analyses based on this method that had been created in connection with current CAP reform, focusing mainly on economic situation and production structure. Such models could be found for Germany (Kleinhans *et al*., 2000, cited by Majewski and Was 2005), Ireland (O'Connell, 1998, cited by Majewski and Was, 2005) and Poland (Berg *et al*., 1999), in the latter case the linear model has been used to assess the impact of implementing CAP in this new member state. Majewski and Was (2005) use both farm and sector model to optimize farm and production structure within a region in this changing policy environment.

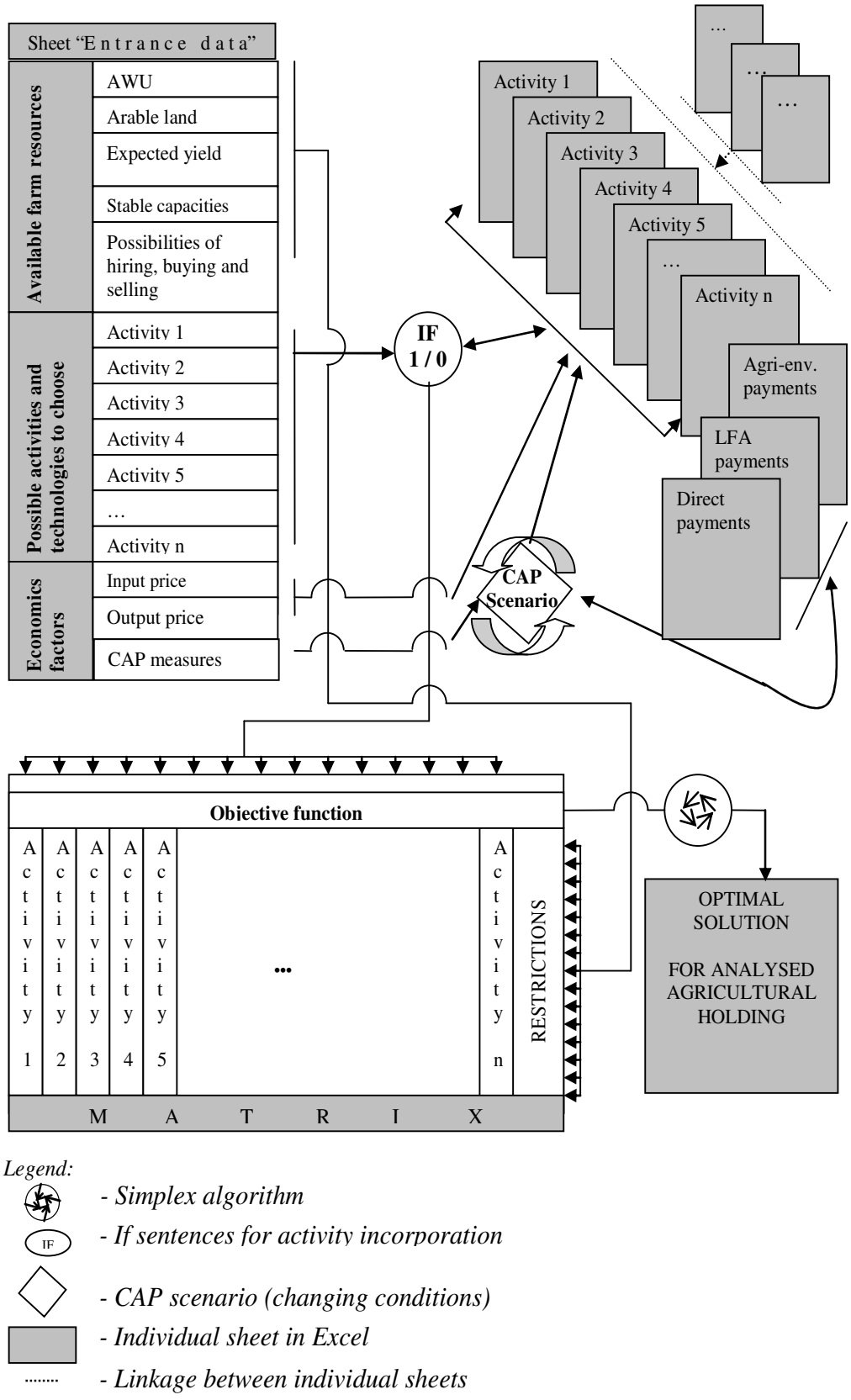
The paper aims to present developed linear programming model that can be utilized on Slovene agricultural holdings with the objective to find the optimal production plan on economic basis (maximising total gross margin). We are going to represent importance of CAP in Slovene agricultural area and consequently also the impact of current reform in different agricultural sectors. The new economic environment caused by reform presents farm managers with a new range of solutions to improve economic outcome.

Material and Methods

The model has been developed in Microsoft's Excel framework. In its basic version, it includes a macro called solver that is capable to solve linear and also non-linear problems. If we assume linearity the optimizer employs the simplex method to find an optimal solution and give us sensitivity information. The "free" bundled version of the Excel Solver supports just up to 200 decision variables (Microsoft Excel…, 1999). This is the main reason why we have chosen only a few activities from the numerous interesting in Slovenian agricultural sector. Therefore we decided to focus on those sectors in Slovene agriculture where one can expect significant impacts of actual CAP reform in the field of direct payments. Previous research (Rednak *et al*., 2005) shows that this reform will have the most significant impact in the cattle sector.

Developed linear model is shown schematically in Figure 1. The figure shows interactions between different calculations with corresponding data, placed on separate sheets. Such structure enables easier overview and any further improvement including simulation procedure is much easier. Another reason to put emphasis to this complex structure lies in user-friendly input for analysing individual farm case. The most elegant way to solve such problem is to gather all input data on one sheet and make links to each calculation (Figure 1). This makes analysis for different agricultural holdings simple and fast. Consequently the possibility for mistakes is also much reduced.

Figure 1: Organization scheme of developed optimisation model based on linear programming method



Included Activities and Restrictions

An important step in building a linear model is to define activities (processes) with technological (input - output) coefficients. Depending on the basic platform used (in our case Excel) the complexity of the model is constrained. For this reasons the spectrum of included activities in comparison with interesting activities in Slovene agricultural sector is limited. Consequently the model is useful only for agricultural holdings dealing with activities included in the model. The main part of model database, especially input-output coefficients, is taken from Gross Margin Catalogue (Jerič, 2001). Since this catalogue considers prices from the year 2001 they are updated to 2005 values. We applied average prices and costs that are annually calculated for the needs of model-calculations (KIS, 2006).

Included activities could be classified in four groups:

2. The first group comprises livestock activities (different technologies and purposes of cattle and sheep breeding).
3. Second group includes forage production on arable and grass land.
4. A very comprehensive part presents crop production activities. Their main purpose is covering livestock nutrients' requirements in relation to intensity achieved on analysed farm, and surplus for selling on market.
5. In the last group we can classify all other activities (purchase, commodity selling, hiring of land and labour and transfers within farm household). This group is the most heterogeneous, as it connects and completes all other three groups at different stages.

To get more realistic model we decided to construct sets of production activities according to possible technologies and similarly also to different potential harvests achieved. One part of production activities is divided further into sale and production (field harvests and hay). Just the opposite is in livestock production activities where selling is assumed. Model is organized in the way that only one technology could be selected at once. So the developed model is not meant in the first place for searching the best technology or the optimal intensity, but to find the optimal solution within pre-selected activities, defined by the user.

Among livestock activities cattle sector is presented by activities of dairy cows, suckler cows, beef and veal production. Other livestock activities are not included yet.

The second activities group joins all kinds of forage conservation like preparing hay, silage etc. on arable and grass land and also grazing. Several technologies of cereals production like maize, wheat and barley are in the third group. The last group includes buying and selling produced fodder, labour hiring, arable and grass land renting, storehouse balance, demand and supply of milk quota and of several premium rights.

The model includes only the most important constraints that must be satisfied to find the optimal solution. We can separate them into four major groups:

6. zootechnical constraints (herd size, animal nutrition requirements)
7. agrotechnical constrains (land available (arable, grassland, pastures), crops rotation, mineral nutrition balance, share of cultivation)
8. policy (milk quota, premium rights for suckler cows, premium rights for sheep headage payments; maximum livestock density allowed)
9. specific farm constraints (labour capacities, harvesting technology, storehouse capacity)

For all crop and livestock products full utilization of produced quantities is assumed.

Characteristics of Analysed Agricultural Holding

Developed linear model is capable to analyze different types of agricultural holdings, i.e. specialized or those with mixed production plans.

The model was tested on a hypothetical farm, situated in the hilly part of Slovenia possessing 5 hectares arable land and 10 hectares grassland. Half of this area is located in less favoured areas. On the land available farms produces forage mainly for their own use and in the case of surplus also for sale. By searching the optimal crop production on the arable land also crop rotation was considered (maize up to 70 %, cereals 60 % and at list 20 % clovers). We assumed that farm was specialized in dairy and suckler cows. The farm owns 120 tones of milk quota and 20 premium rights for suckler cows. In searching for optimal production plan it is possible to include other livestock production activities (beef, calves and sheep). The labour available equals to 1.6 annual working units (1 AWU equals to 1,800 hours). When additional labour is necessary it is possible to hire it.

Scenario Analysis

The developed model includes three different direct payments' schemes: (i) until 2006 valid standard scheme assuming EU-15 pre-reform level of payments, (ii) combined scheme to be implemented in the period 2007 to 2013 and (iii) regional scheme that is likely to follow after 2013. According to given conditions and constraints of each scheme we analyzed their effects on optimal production plans. It was taken into consideration that within each scheme it is possible to combine different types of CAP measures dependent on livestock density. Except in the fourth scenario (KP0) where no budgetary support is assumed, all other scenarios envisage payments for less favoured areas (LFA) and some of them also payments for implementing agri-environmental measures. On the basis of these conditions (types of subsidies and livestock density) eight different policy scenarios were analyzed (Table 1).

Table 1: Scenarios Analyzed

Scenario abbrev.	*Scenario specification (type of direct payments and inclusion into agri-environmental measures (SKOP)*)*	*Maximum livestock density (GLU/ha) ***
SS	*Until 2006 implemented standard scheme; farm not included in Slovene agri-environmental scheme (SKOP)*	*2.5*
SSSKOP	*Standard scheme; farm included in SKOP*	*1.9*
SSSEKP	*Standard scheme; farm included in SKOP; farm eligible for extensification premiums*	*1.4*
KP0	*Liberal-market (no budgetary support is in place)*	*No restriction*
RK	*Combined scheme, implemented during 2007-2013; farm not included in SKOP*	*2.5*
RKSKOP	*Combined scheme; farm included in SKOP*	*1.9*
RR	*Regional scheme with single area payment; farm not included in SKOP*	*2.5*
RRSKOP	*Regional scheme; farm included in SKOP*	*1.9*

**Model includes level of agri-environmental payments (SKOP) from the period 2004-2006*

*** Maximal gross livestock units per hectare of agricultural land (for some payments utilized agricultural area, for the other agricultural land for forage production)*

Results and Discussion

Developed linear programming model was employed to find optimal production plan under different conditions (i.e. specializations) for analyzed hypothetical farm. The main results are summarized in table 2.

Table 2: The Main Results for Different Specializations 0n Analysed Farm Household

	Agricultural policy scenarios							
	SS	SSSKOP	SSSEKP	KP0	RK	RKSKOP	RR	RRSKOP
Specialization (GLU)								
Dairy cows	33	28	20	33	33	28	33	29
Bulls fattening	16	16	14	16	16	16	16	16
Suckler cows	19	19	19	12	19	19	12	17
Calves fattening	38	29	14	55	37	28	37	28
Sheep breeding - milk	15	15	9	15	15	15	15	15
Sheep breeding - meet	21	21	14	21	21	21	21	20
Total gross margin (EUR)								
Dairy cows	29,791	33,321	27,925	20,677	31,673	35,507	29,661	33,433
Bulls fattening	22,509	23,727	23,794	9,765	18,499	19,592	14,138	15,315
Suckler cows	14,501	18,628	20,560	5,654	12,748	16,875	10,320	14,751
Calves fattening	23,869	21,224	15,636	15,089	21,532	20,385	17,581	16,433
Sheep breeding - milk	27,120	29,644	27,491	20,614	23,744	26,281	25,138	27,704
Sheep breeding - meet	16,203	18,716	16,199	7,833	11,830	14,342	12,999	15,482

The highest total gross margin is attainable with dairy farming. This seems logical since a predominant part of utilized area is grassland where farm can produce only voluminous forage. The optimal solution under standard scheme (SS) includes 33 dairy cows, while their number is reduced proportionally with livestock density constraints in scenarios SSSKOP and SSSEKP. Almost the same herd size and slight economic improvement in all reform scenarios show that economic interest for dairy production on the analyzed farm will not significantly change under the assumption of constant commodity and input prices. Stability of this solution is most dependent on achieved milk price. Significant improvement is noticed in all schemes if farm includes in agri-environmental measures (SKOP) and just the opposite holds for farming without any subsidy (KP0).

Already on the basis of area available (low proportion of arable land) one can expect that bulls fattening is not competitive compared to dairy production on analyzed farm, except if this is an additional activity on the holding (therefore farming does not represent the main source of income). For the optimal feed ration of animals essentially higher percentage of arable land would be necessary on the farm (current share only 33 %). Since this share on hypothetical farm is assumed to be fixed, it could be expected that herd size is more or less the same for all scenarios. The number of fattened bulls is reduced only in the third scenario of the standard scheme (SSSEKP), where the reduction is imposed by lower livestock density (1.4 GLU). In this case extensification premiums efficiently compensate the deficit of revenue caused by lower livestock density.

Bull fattening is one of those sectors, where CAP reform will have the most negative impacts on economic outcome. This is the consequence of total or partial reduction of production coupled direct payments. More than 4,000 EUR better economic outcome is obtained under combined scheme compared to regional one, since the former keep one part of direct payments coupled and another one in form of historical payments.

Suckler cows optimal herd size is more or less constant in all standard and combined scheme scenarios. Slight decrease in number of suckler cows is indicated in KP0 and both regional scheme scenarios, where no coupled payments are in place. Economic outcome in comparison with dairy and beef production is not stimulative, but it has to be kept in mind that extensive organization in this case brings lower harvests and consequently also lower labour demand. Suckler cows seem interesting especially when farming represents only a supplementary source of disposable agricultural household income. Under the standard scheme farm could improve economic result with involvement into agri-environmental measures and managing under limits of 1.4 GLU per hectare to get additional payments (extensification premiums). From 2007 it is undoubtedly sensible to adapt agricultural practice in compliance with CAP rural development program conditions (LFA and agri-environmental payments). In the analyzed case this means up to 4 thousand EUR increase of total gross margin. The importance of subsidies confirms also the fourth scenario (KP0) where result is in general halved compared with actual policy environment.

Even though calf fattening is not very frequent specialization on Slovene farms, we simulate it. What is interesting in this sector is that breeding is actually not connected with land, because it is possible to purchase all forage. Linkage to land is required through allowed livestock density. In all scenarios with exception of KP0 (where the main limited factor is forage), area is the most limiting factor. Except small amounts of hay all other farm harvests are sold. In standard scheme scenarios (SS and SSSKOP) high level of direct payments are considered, especially slaughtered payments that are cancelled with CAP reform implementation. This fact will not have an important impact on the optimal herd size, but in worsening economic situation of the sector.

Sheep specialization was also tested with the model. If we focus on sheep for milk production with further milk processing and direct sale of dairy products at farm gate, it demands very high labour input.

This leads to lack of household labour supply and consequently all scenarios include hired labour force (more than half needs).
In all scenarios herd size is the same, except in the scenario with more restricted livestock density. Anyhow, adapting management to conditions of SSSEKP scenario would be irrational since no extra payments are on disposal for sheep. The optimal financial plan would be achieved with involvement into agri-environmental measures (SSSKOP). Comparing with other livestock sectors this is the only one where regional scheme would lead to better outcome. Difference between combined and regional scheme is approximately 1,000 EUR and both results can be improved for 2.5 thousand EUR by agri-environmental payments.

Less intensive in terms of working hours is lamb production. Scenario results utilise only around third of household labour available. The farm would improve obtained results by substitution of 5 hectares of fields for meadows. Even though the farm has to purchase individual premium rights in scenarios SS, SSSKOP, RK and RKSKOP, herd size does not reduce compared to other scenarios. From this fact we can conclude that the most limiting factor for herd size increase is forage produced on grassland. A regional scheme improves economic outcome compared to a combined scheme. The reason can be found in very low livestock density achieved in optimal solutions. But in both reformed schemes result deteriorate significantly compared with standard scheme.

Conclusions

The model results confirm the hypothesis that the reform will have negative economic impacts on farms with intensive production practice, especially those with high livestock density. But in many cases it is possible to improve the economic outcome of farming just with more efficient production plan.
In analyzed livestock sectors the high importance of subsidies is shown, ranged between 23 % and 73 % of total farm gross margin. In both CAP reform schemes this percentage is reduced. In a combined scheme it remains between 26 and 60%, depending on farm involvement in agri-environmental measures. The regional scheme would bring drastic change in achieved total gross margin compared with this year's implemented combined scheme. Nevertheless, the share of subsidies in total gross margin remains comparable to those in combined scheme. Model results confirm that calf fattening specialization is most dependent on subsidies (in standard scheme) and consequently this sector experiences the highest shock. Just the opposite holds for dairy farming - both cows and sheep, where share of subsidies in farm gross margin will remain stable. The highest share of budgetary support is noticed in suckler cows (65 % - 82 % of gross margin).

The model results also confirm growing importance of CAP pillar II payments, among them particularly agri-environmental support. In all three schemes observed direct payments enable farmers to improve financial results and in both reform schemes they alleviate economic impacts of CAP reform.

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FARMERS AND ADVISORS ATTITUDES TOWARDS THE ENVIRONMENTAL STEWARDSHIP SCHEME

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Abstract

Attitudes of 25 farmers and 9 advisors towards the Environmental Stewardship Scheme (ESS) in North Norfolk are reported. Simplicity and ease of entering the ELS is contrasted with difficulties associated with applying for the HLS. Advisors rank environmental improvement less important than farmers, and their advice tends to reflect their specialist training. FWAG was the exception. There was support for an intermediate scheme to bridge CSS and ELS, and HLS: this would assist smaller farms and those participating in the CSS. This may increase "people additionality" – which should become a key measure of success for agri-environmental schemes (AES).

Key words: agri-environment schemes, stewardship, advisor(s), farmers, attitudes.

Introduction

In December 2004 the Environmentally Sensitive Area Scheme (ESA) and the Countryside Stewardship Scheme (CSS) closed to new applicants. They have been replaced by the Environmental Stewardship Scheme (ESS). Opening on 1st January 2005 it has attracted 3.4 million ha under 25,000 separate agreements, with first year payments of £123 million (DEFRA 2006). The ESS has two levels: an Entry Level Stewardship (ELS) which has relaxed the principal of environmental additionality and the Higher Level Stewardship (HLS) which has maintained it. Environmental additionality requires agreements to add to the existing stock of environmental capital. Allowing existing environmental features to be entered in an application helps to increase participation rates, a crude measure of "people additionality" (Carey *et al.* 2003), but which is better considered as developing positive attitudes to conservation because this "will in the long-term be more effective than policy measures that do not, since a positive shift in attitudes will increase the output of conservation goods at any specified level of budgetary cost" Colman *et al.* (1992: p.69). The ESS remains a voluntary scheme which is why analysis of farmer's environmental decision making is of great importance (Wilson 1997; Porter, 1998; Wilson and Hart 2000; Buller 1999).

Brief Overview of Environmental Stewardship Scheme (ESS)

Each ELS option selected by the land manager has points attached and farmers need to select options with at least 30 points/ha. Options are recorded on the farm's Farm Environmental Record (FER) which is a map of the land farmed. Acceptance into ELS is guaranteed if all scheme requirements are met. The HLS is a competitive, differentiated scheme. Applicants must be enrolled in the ELS. A large list of

additional options is available within the HLS[1], but only those options outlined in the Targeting Statements attached to each Joint Character Area (JCA) Guidance Notes are awarded points.[2] The sum of points must surpass a funding-threshold and options are recorded on the Farm Environmental Plan (FEP). If so, a Project Officer will decide if the proposal will be accept – but acceptance is still not totally guaranteed (DEFRA 2005a: DEFRA 2005b). Existing agreement holders (in CSS, ESA or Habitat Scheme) have barriers to entering ELS and HLS. However, when the oldest CSS agreement expires the agreement holder will normally be invited to terminate all their existing agreements and apply to enter into a new HLS agreement (DEFRA 2005c). Other changes allow CSS participants to switch to the ESS under prescribed conditions (NFU 2006).

Brief Discussion of Participation Decisions and the "Information Environment"

A recent review of 160 publications and research reports from six EU member states (Finland, Germany, Hungary, The Netherlands, Spain and the UK) into the current state of knowledge on factors affecting farmer's attitudes to biodiversity conservation by Siebert *et al.* (2006) concludes that economic considerations are a primary, but not sole, driving force for farmers to participate in AESs. Other influences can broadly be divided into scheme factors (duration, payment levels and structure, application process whole- or part-farm), policy factors (voluntary nature, source of finance, environmental goals), farm factors (size, ownership, landscape), farmer factors (age, wealth, attitudes, education, attitudes to civic duty) and the farmer's information environment (Wilson 1997; Siebert *et al.* 2006). The latter includes the dynamics within the farming region, such as whether neighbours are participating, the influential behaviour of community leaders and the pace of innovation diffusion within a district (Jones 1963; Wilson 1992). However, the information environment has been regarded as a neglected factor in the literature (Wilson 1997) and is a focus of this study.

Research Methodology

The survey involved farmers and farm advisors who work in the ESS's Northwest Norfolk Joint Character Area (JCA), an area not previously designated an ESA. The survey questionnaires are available in Cross (2006). Five farmers were initially selected at random, each gave details of neighbouring farmers who were then approached. All major farm business/agri-business advisors (FBAs) and major agronomy companies in the area were contacted. Of 29 farmers approached, 25 (86%) agreed to participate, the high participation rate supports the survey approach used. Of the ten advisors approached, all initially agreed to participate but one later withdrew.

Findings of the Survey of Farmers

Key results of the research only are presented here, further details are available from Cross (2006). Table 1 shows 12 of the 16 farmers previously in the CSS are currently either applying for or intend to apply for HLS, therefore participation in the CSS is a good, but not exact, predictor of intent to apply for the HLS.

[1] There is a list of over 180 possible features, along with their condition and management prescriptions.

[2] A JCA (of which there are over 150) is defined as an area that has common characteristics in which the environment faces similar threats and opportunities: it has a similar landscape, heritage characteristics and therefore conservation goals. ESS booklets list options and activities that particularly benefit these common conservation goals.

Table 1: Actions and intentions towards joining Higher Level Stewardship, by experience with CSS (N=25).

	In or have been in CSS	Not/never in CSS
Total (N)	16	9
In HLS	0	3
Applying to join HLS	4	0
Intend to apply for HLS in the future	8	2
Do not intend to apply for HLS	4	4

Source: Environmental stewardship: ELS

All those interviewed were either in the ELS or in the process of applying to join. 56% reported mapping problems during application, 36% had waited more than a year for their map, a similar proportion 6 months. Two farmers said that if the problems persisted they would discontinue the process, posing a threat to targeted participation rates if these results are more widely applicable. The main reason given for enrolling in the ELS was to recoup lost income: farmers did not believe they were profiting from participation, but rather simply recouping money that had been "taken away from them" through modulation (Table 2). Some were worried about the inflexibility of the payments. 'Already doing most activities' and 'new activities easily implemented' scored highly for the ELS. "Ease of management"/"goodness of fit with existing practices" was also important – the appeal of relatively undemanding changes to management practices is clear. Environmental improvements and benefits were of little importance in selecting ELS options.

Table 2: Table of descriptive statistics for the whole farmer sample and the groups within the sample. (N=25).

Group	Number in group	Mean age	% with off farm income	Mean farm size	% with previous CSS enrolment	% that are land owners*	% in or applying for HLS
		years	%	Ha	%	%	%
All farms	25	48.5	52	861.2	64	64	28
Those who are/have been in CSS	16	47.4	62.5	959.9	100	62.5	25
Those never in CSS	9	50.3	33.3	685.6	0	66.7	33.3
Farmers with over 800ha	13	50.1	53.8	1223.8	76.9	84.6	38.5
Farmers with less than 800ha	12	46.8	50	468.3	50	41.7	16.7
Those that use AES advisors	21	49.7	52.4	769.1	71.4	57.1	28.6
Those that do not use AES advisors	4	57.5	50	1112.5	25	100	25

* Landowners were often tenants as well.

Source: Environmental stewardship: HLS
Three farmers had enrolled in the HLS and four were actively applying. Of these, 4 stated the major advantage of the HLS over the CSS was higher payments - most described the levels of payment as 'more than fair'. All three currently enrolled in HLS believed that enrolment and implementation was more problematic than for the CSS because of the complexity of submitting applications - nevertheless, all said they would enrol again. Unlike the ELS, all these farmers believed the HLS would improve the environment. Improving shooting was a primary or secondary motivation for 72% of the 7 in or applying proving it to be a particularly important motivation.

Farmers' Information Environment And The Role Of Advisors In Aes Decisions

Discussion with peers plays a significant role in providing information, all farmers said they took notice of the activities of "exceptional local farmers" and would actively seek them out to discuss agricultural issues. 21 (84%) said they had used advisors for AES advice – of these 18 allowed the consultant to strongly influence the content of the agreement. 13 (67%) used FWAG, 8 (40%) used FBAs and 6 (28%) used agronomists.[3] Farmers noted that advisors had become more environmentally based.

Findings from the Survey of Advisors

Nine advisors were interviewed, all offered advice on the ELS[4] and all but one (an agronomist) advised on the HLS even though none of the agronomists and only one FBA had given AES related advice 5 years ago. All said that the proportion of their firm's clients requesting AES advice to had more than doubled within five years; the representative from FWAG said the organisation's workload had doubled. All advisors believed payments were sufficiently high for both ELS and HLS and were happy to encourage participation. Expected 'environmental improvement' (for both ELS and HLS) was of <u>little</u> importance for either group (but particularly among the agronomists). The FWAG spokesperson on the other hand gave 'environmental improvement' as the main reason for enrolment in either level - with 'profitability' and 'improving other enterprises' secondary concerns. Most believed AESs had an important role to play. Agronomist noted the possible negative impact in the long-term: promoting weed growth and transmitting disease.

Overall, advisors placed less importance on 'environmental improvement' in the HLS than farmers generally had, reinforcing the motivation to fulfil business goals, and highlighting a lesser concern for the environmental aims of the ESS. FBAs unanimously believed that profitability was the main reason for enrolment, with ease of implementation also important. All stated that 'already doing most activities', 'new activities easily implemented' and 'little impact on the rest of business' as important reasons for participation. All three agronomists also believed profit was a key reason to enrol – but it was not unanimously a primary motivation. An equal number gave 'raising yields' as a primary reason, stating that the removal of less productive areas meant average yields increased and total inputs decreased.

Further Analysis of Results

Table 1 shows that 4 of the 16 participants in the CSS do not intend to apply for the HLS but 5 of the 9 not previously in the CSS have or intend to apply. Considering the relatively high demands and inflexibility of the HLS, it is perhaps not surprising all previous CSS participants do not intend to apply.

[3] We have classified advisors as primarily Farm Business Advisors (FBA) or mainly agronomists based on their principle training and advice offered. We also interviewed a spokesman for FWAG who advises farmers and trains FWAG advisors.
[4] One of the interviews was with a representative of FWAG, 5 had backgrounds farm business advice and 3 in agronomy.

But it is a measure of some success to have attracted farmers not previously in the CSS in its first year of operation.

The smallest farms (<500ha) have the lowest proportion enrolled into the CSS and the highest percentage with no intention of applying for the HLS, yet all have used advisors for AES matters (in contrast with the largest farms). Smaller farms put greater importance on management and activity implementation, with 6 (86%) noting 'already doing activities' as a primary reason for enrolment compared to 4 (36%) of medium and 4 (57%) of large farms. Interestingly, *smaller farms also noted the importance of environmental improvement more often*. This evidence suggests it is not a lack of motivation that stops participation by smaller farms but an inability to reasonably accommodate the scheme. For these reasons, the ESS, as currently drafted, disadvantages smaller farms.

5 (63%) farm advisors believed that some ELS options were open to too much interpretation. 7 advisors (including FWAG) thought HLS needed changing, believing it to be too elitist and too difficult to submit successful applications. FWAG, 3 of the 5 FBAs and 1 of the 3 of agronomists believed there was room for an **intermediate scheme** between the ELS and HLS, particularly if the HLS was not going to be relaxed.

Discussion

The ELS appears to have overcome the resistance to AESs in this predominately arable area. It is taking over from the CSS in providing income for poorer land but allowing agricultural production to continue elsewhere relatively unaffected. Financial issues appear the key driver with both farmers and advisors. But there is an implication that actions motivated by this belief mean the scheme is not perceived to be voluntary – rather a survival necessity. There are also concerns that the substantial enrolment in the ELS will reduce funds available for the HLS which implies the rate of national modulation will need to increase. The findings suggest that the ELS must be better designed to help farmers prepare farmers for the more demanding HLS. Economic gain is still an important factor in HLS entry. Yet the criticisms of farmers and advisors suggest revisions are necessary to increase participation rates.

There is evidence, albeit within a small sample, that the three categories of advisors offer similar advice but based on different motivations. There are indications that the advice given by the FBA and agronomists reflects their traditional training and former principle areas of advice. Notwithstanding their own views of their improved ability to offer environmental advice, most do not believe the ESS will achieve much in the way of environmental improvement. Without more consideration being given to the environmental aims of the schemes FBAs and agronomists reasons for application are not compatible with many of the farmers' belief that agricultural and conservation achievements can occur together.

A greater level of environmental training is needed to create a more balanced approach in the advisory sector. The majority of advisors point clients to FWAG for information and nearly all use FWAG as a source of advice themselves. FWAG thus plays an important role in helping participants move from the CSS to the HLS and this role is likely to grow as agri-environmental measures and environmental legislation become more important, yet we were told it is unable to keep up with present the demand for its services.

This survey has highlighted a group of CSS agreement holders and farmers of smaller farms who feel they are will not be able to apply for the HLS. This represents a potential loss of willing individuals from the agri-environmental participation. An **intermediate scheme**, helping to transfer current CSS holders and small farms into the HLS, could;

- Incorporate activities currently available within the farmers current CSS agreement(s);

- Increase the number of options available within the JCA's Targeting Statement;
- Specifically include options that support current farming activities, such as shooting, hunting and livery services;
- Reducing areas/lengths attached to each option or reduce the number of points needed per ha for smaller farms (other CAP programmes offer concessions to smaller farms).
- Allow smaller farms to join together to submit a joint application to the HLS such that combined they achieve the target threshold (points/ha) even if individual farmers within the group do not.

These changes will improve transition from the CSS to the new scheme and help smaller farms participate, retain farmers who have experience in environmental management gained under the CSS, and in increasing participation rates. Together, these changes will increase the likelihood of delivering "people additionality".

Conclusions

Although based on a small sample, the research findings should not be dismissed on this basis alone. They indicate areas of particular interest which could be followed up by a larger survey. Enrolment into the ESS is predominately an economic decision based on profitability and productivity so reductions in payments would present a threat to participation. The ELS is not likely to instil a change in attitude toward farming or conservation, partly because advisors (excluding FWAG) share the farmer's opinion that farming comes first in deciding to participate in ELS agreements.

The HLS was criticised for being too demanding - particularly for small farms and to a sub-sample of those currently enrolled in the CSS. This provides support for an intermediate scheme. This would most likely improve the "people additionality" associated with ESS - the voluntary over-delivery of environmental goods – which should become a key measure, along side the change in total stock of environmental benefits, of the successfulness of the ESS.

Advisors have an influential role on ESS applications. FWAG is particularly important in this regard – advising both advisors and farmers. Its environmental background means it gives consistent and reliable advice. There appears some justification for enhancing the funding available for FWAG so it can adequately deal with its influential role and growing workload.

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LEADER - THE BOTTOM-UP APPROACH TO RURAL DEVELOPMENT: AN IRISH PERSPECTIVE

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Abstract

In the late 1980's the European Commission led by President Jacques Delors undertook a review of the performance of the member states of the EU. This was prompted by decreasing levels of economic growth, increasing unemployment rates and social issues. There were indications that rural areas were performing particularly poorly, partly because of the decrease in employment from agriculture. Also regional and national policies had tended to focus on the development of infrastructure and services in urban areas. This was exacerbated in peripheral regions such as Ireland as growth, in a stagnant economy was limited primarily to Dublin. Thus as young people left rural areas, villages, towns and smaller cities there was limited availability of opportunity to remain part of their community. In the early 1990's a range of measures were introduced to promote competitiveness in different ways across the European Union. In 1991 one such measure was introduced to specifically focus on the competitiveness and sustainability of rural areas. This was called the LEADER Programme. The principle behind this programme was to provide finance to locally formed, autonomous groups who were encouraged to invest in initiatives to bolster the local economy based on the group's plans and strategies, formulated from local knowledge. In effect each group could prioritise and invest in sectors that they deemed to be most appropriate for their area rather than taking a more standardised regional or national approach. These Groups, known as Local Action Groups (LAGs) were allowed flexibility in how they operated as long as their investments were not seen as a duplication of what was offered by state supported bodies or other state initiatives. Innovation therefore became a central characteristic of each LAG plan. The overall focus was to use LEADER to seed a 'Bottom-Up' approach towards Rural Development to complement and connect with regional and national 'Top-Down' support measures.

Keywords: rural, economy, local, autonomous

Introduction: What is the LEADER Approach, Where did it Originate and How has it Evolved?

In the late 1980's the European Commission led by President Jacques Delors undertook a review of the performance of the member states of the EU. This was prompted by decreasing levels of economic growth, increasing unemployment rates and social issues. There were indications that rural areas were performing particularly poorly, partly because of the decrease in employment from agriculture. Also regional and national policies had tended to focus on the development of infrastructure and services in urban areas. This was exacerbated in peripheral regions such as Ireland as growth, in a stagnant economy was limited primarily to Dublin. Thus as young people left rural areas, villages, towns and smaller cities there was limited availability of opportunity to remain part of their community. In the early 1990's a range of measures were introduced to promote competitiveness in different ways across the European Union.

In 1991 one such measure was introduced to specifically focus on the competitiveness and sustainability of rural areas. This was called the LEADER Programme.

The principle behind this programme was to provide finance to locally formed, autonomous groups who were encouraged to invest in initiatives to bolster the local economy based on the group's plans and strategies, formulated from local knowledge. In effect each group could prioritise and invest in sectors that they deemed to be most appropriate for their area rather than taking a more standardised regional or national approach. These Groups, known as Local Action Groups (LAGs) were allowed flexibility in how they operated as long as their investments were not seen as a duplication of what was offered by state supported bodies or other state initiatives. Innovation therefore became a central characteristic of each LAG plan. The overall focus was to use LEADER to seed a 'Bottom-Up' approach towards Rural Development to complement and connect with regional and national 'Top-Down' support measures.

This process was driven by the European Commission from the outset with National and Regional Authorities (and in some cases Local Authorities) somewhat sceptical of the capacity of this type of approach to impact on rural economies. None-the-less the LEADER Programme was launched as a 'pilot or laboratory' project from 1991-1994 operating in 217 areas across Europe. Based on the success of this 'pilot' it was extended into a larger programme, LEADER II, from 1994-2000 expanding to 906 areas. The approach continued to expand over the past six years with many more areas being included across the EU with the introduction of the LEADER + Programme from 2000-2006. In parallel with this a number of National Authorities including the Irish Government also introduced a 'National Rural Development Programme' (NRDP) to complement the funding received under the LEADER + Programme, the result of which has been that all areas and parts of Rural Ireland has access to the LEADER Approach. By the end of the current phase of LEADER anecdotal evidence suggest that LAGs will have supported up to 250,000 full time jobs across Rural Europe. Also, the LEADER approach has provided the platform for investment into community services, amenities and issues that challenge the quality of life of Rural Communities.

The European Commission has had a very high regard for the LEADER Approach. It operates in different ways in different regions but each LAG shares common features (see later). The programme has been formally reviewed throughout its development highlighting the success that it has had in different regions. The LEADER Approach taken in Ireland has consistently been identified by the Commission as one of the most effective examples in the Union.

What are the secrets to the success of LEADER in Ireland? A Practitioners Perspective

A Tradition of 'Meitheal'

'Meitheal' is a word in the Irish Language (Gaeilge) that describes the process of volunteering, coming together as a community to deal with a common issue, a type of 'self-help' approach. Irish communities have long had a tradition of establishing and operating volunteer groups for a variety of purposes. In the 1960's and 1970's 'Integrated Rural Development' groups began forming across the country to attempt to address the growing economic and social issues impacting upon their areas. The 'drivers' behind these groups were the volunteer and community based bodies in rural communities. Communities were becoming increasingly frustrated with the lack of action being taken locally. The Irish bureaucracy was heavily centralised in and around Dublin. The Local Government Process in Ireland never developed in the same way as it had in other economies and outside of maintaining basic infrastructure such as roads, they were relatively powerless to deal with the broader requirements of the community. Thus, local communities began to organise to identify local needs and opportunities. The limiting factor for these Integrated Rural Development Groups was the lack of resources to implement their plans. When the LEADER Programme started and gathered momentum it provided a spark to ignite the flame of a new form of investment into rural areas.

The 'Community' as the Primary Partner

One of the common features of the LAGs implementing LEADER across the EU is that they are formed around the principle of 'Partnership'. Typically this partnership will consist of four main pillars: Community Representatives, Statutory Body Representatives; Local Government Representatives and Social Partners (local business and trade unions). Irish LAGs differ from many of their sister groups in other parts of the EU in that the primary partner is the 'Community and Voluntary Sector'. The community and voluntary sector is typically more organised and developed than many of its counterparts in other regions in Europe. Smaller volunteer based groups are also part of community and area based networks which allows for a democratic link to be made from the local volunteer to their representation on the LAG. This provides a platform for the LAG to be closely linked to local circumstances and empowers local communities as they can see real results from the efforts that they put into supporting the LAG to develop. A typical LAG in Ireland will have a Board of Management elected annually with at least 50% of the Board Members representing community interests. They are joined on the Board by State Bodies, Local Government and Social Partners deemed to be most relevant to the focus of their Area Based Plan.

Growing Within 'Natural Area's of Development'

The area of operation varies from one LAG to another. Each LAG operates in its own distinctive geographic area with European Commission Guidelines stating that the minimum population should be 10,000 inhabitants and a maximum of 100,000 people within the LAG area (with exceptions allowed if agreed). Typically a LAG area will be made up of a number of rural communities, small villages and towns. In Ireland LAGs were formed around 'natural areas of development' – these are areas which are culturally, economically and socially linked. In some cases they correspond with Local Authority or other State Service boundaries, in other cases they don't. The key principle in all LAG areas is that people within the area understand the link between their LAG and its area of operation. LAGs will therefore operate in areas that have common issues, common opportunities, common agricultural practices, and with communities that are connected to each other at a number of different levels. This has proven beneficial as it allows the LAG to develop a clear focus in terms of the issues it can address and how this will be achieved. It is beneficial for the user of its services as there is an understanding of why and how the LAG operates and it is beneficial for the area as it reinforces the sense of identity and achievement that can be gained by working together.

The Integrated Approach

Another common feature of the LEADER Programme is the principle of supporting the development of the rural economy in an integrated manner. This can be narrowly defined in some regions as an integrated approach towards the development of sectors such as Tourism, Craft, Food and Services which generate new employment opportunities. However in Ireland, with LAGs being driven and owned essentially by the community, the development of integrated plans and strategies has focused on the overall position of the community, its sustainability and an integrated economic, social and environmental approach. This allows for participation and input from the larger community and encourages more of a strategic emphasis in terms of how and where the LAG invests. It also provides a platform for the LAG to operate outside the LEADER Programme (see later).

The Support of Government

The Irish Government quickly identified the LEADER Approach as one which could provide an important and effective tool in supporting rural development. Initially the programme was fostered through the Department of Agriculture & Rural Development who were the overall managing authority

for the programme in Ireland. In 2001 a separate Government Department was formed to deal with Community, Rural and Gaeltacht Affairs under Minster Eamon O' Cuiv. This development has had a profound impact on the positioning of the LEADER Programme nationally. Since forming this Department there has been a greater level of debate around the 'The National Cabinet Table' on rural issues leading to greater levels of investment into rural initiatives and in turn providing opportunities for LAGs to access these funds to invest in their areas. There is very close liaison between LAGs and the Department with monthly review meetings hosted by The Irish LEADER Groups Network (Comhair LEADER na hEireann) and senior officials from the Department of Community, Rural & Gaeltacht Affairs, with the Minister consulting with the Network on a regular basis. There are also events promoting the LEADER Approach jointly hosted by Comhair LEADER na hEireann and the Department such as the 'Food and Craft Villages' that have over one hundred new food and craft producers each year promoting their products at the National Ploughing Championship which attracts over one hundred and fifty thousand visitors. The Department have clearly stated their preference of working with LAGs as their 'platform of choice' for investing into rural communities and actively encourage a similar approach be taken by other Government Departments with provision for community based investment.

Budget Base and Leverage

The combination of having a broad based plan and the support of a Government Department that encourages direct investment through the LAG beyond the LEADER Programme has ensured that the core budgets for each group has increased substantially over the years. The average LEADER/NRDP budget over the past six years per LAG in Ireland was circa €3m. Most LAGs however will have directly invested over €6m into their local areas through a combination of LEADER, other national initiatives and community based programmes and through partnership with other LAGs and Authorities across the EU in accessing European Wide Initiatives. An example of a National Initiative is the Rural Social Scheme which provides an additional income source for low income farm and fishery families based on part-time work made available through the LAG in the community. An example of other National Programmes include the Local Development Social Inclusion Programme which is currently delivered by 30% of LAGs and is targeted at supporting the most disadvantaged in the community through a range of confidence building community, family and employment based actions. In the coming years all LAGs in Ireland will deliver this programme in parallel with the LEADER Initiative. A number of European Initiatives can also be accessed by LAGs to bolster local budgets.

A key principle applied by LAGs is to maximise the levels of matching finance that can be generated through its investments from other public, private or community investors. This is known as the groups 'leverage capacity'. At times the LAG is not the direct financer into projects but can facilitate local and national partners to work together. Where the LAG needs to provide finance it will normally be as a percentage of the overall costs, thus the funding is utilised to 'seed' a partnership approach towards developing the project. This leads to a multiplier effect for the investment made by the LAG – although this has not been measured it is estimated that the 'multiplier' for LAGs is in the order of attracting three euro for every one euro invested by the LAG. This ability is of particular importance in supporting social and community based investments and the capacity of Local Groups to maximise its 'leverage capacity' has been formally recognised by the Irish Government and Social Partners in its current National Development Programme 2007-2013.

Placing Real Value on Volunteering

One of the most valuable elements of the LEADER Approach is that it puts a monetary value on volunteer time for community based projects. This value ranges from €13 to €20 per volunteer hour given to a project. This has been beneficial in an Irish context in two different ways. Firstly, it makes projects more feasible. An example is when the community of Clonmult in East Cork needed to renovate

a disused school in order to develop a community facility for childcare, meeting facilities for active age groups and other community purposes. The cost beyond grant aid would have amounted to hundreds of thousands of Euro, beyond the means of a community with a population of less than two thousand people. With the help of the Local LAG, East Cork Area Development (ECAD) the community were able to negotiate support from FAS (the National Training Body) and Cork County Council resulting in a huge volunteer effort over a three month period which saw local farmers, home-makers, other professionals, young and old, working with local builders, painters, electricians and plumbers who gave of their time freely. These were supported by qualified engineers and apprentices provided by FAS and the County Council. The end result was that the 'new' community centre was completed at a cost to the community of less than €30,000 and a facility that is a far bigger part of the community than simple bricks and mortar.

The second important aspect of placing a real value on volunteer time has been to use it as a tool to promote voluntary effort at a time when there is increasing pressure on people's time. Ireland is rightly proud of its tradition in developing volunteer based services. Volunteering was a fundamental element in the establishment of the Co-operative Movement in the Agri-Food Sector at the turn of the 19th Century and developing the Credit Union Sector which became a model of best practice transferred across the world. However a side-effect of the phenomenal change to the Irish economy and society over the past fifteen years has been a reduction in the increase in volunteering. Many community and volunteer based groups are struggling to maintain their volunteer base at a time when there is increasing levels of need as communities change and grow. The Irish Government recently undertook an 'Active Citizenship Review'. This process highlighted the need to find new ways of promoting volunteering and recognised the unique capacity of Local Groups in facilitating this process. LAGs are at the forefront in working with communities to redress this issue and the fact that a real value can be placed on the time given by people is central to addressing this matter.

The Irish LEADER Approach – New Challenges

The Pressure Build-Up: Governance

The LEADER Approach has continued to develop and expand over the years in Ireland. The sector is about to go into a new phase in the coming year which will see a substantial increase in the levels of funding allocated through LAGs (see later). With this comes increased responsibility for the Boards of Management collectively and for each Board Member individually.

Each LAG in Ireland was established as an independent legal entity (either Company Limited by Guarantee or Co-operative Structure) which operated autonomously within rules and regulations provided and up-dated by the Department. In effect these are 'Non Government Organisations' (NGO's) complying with company law and administering public funds. In the past five years there has been an increased level of focus on public accountability which started at Government Department Level and has been brought into the Local Development Sector in recent times. Directors of the LAGs must now comply with public body based guidelines including reportage under the 'Ethics in Public Office' which requires yearly statements from each Board Member (company director) and from the Company as a whole. There are also suggestions that in the future the Chairperson of the LAG will be Government Appointed and that Local Authorities will have a stronger role both in terms of representation on LAGs and in terms of the selection of the Community and Voluntary Representatives.

A much needed debate is emerging around the fundamental question about how to maintain the core 'community based strengths' and the autonomy of LAGs whilst meeting the necessary governance

requirements that are essential in maintaining confidence in the sectors capacity to delivery value for money and accountability on behalf of the state and ultimately the tax payer.

Improving the Link to the Farming Sector

One of the key focuses of the LEADER Approach is to stimulate new and alternative forms of income generation in rural areas. In advance of LEADER being introduced the Department of Agriculture (in Ireland and elsewhere) had begun to look beyond Common Agriculture Policy (CAP) instruments which primarily supported conventional farming. They correctly envisaged the emerging needs of some farmers to develop additional income sources on-farm. A range of initiatives targeted at 'alternative production and alternative on-farm income generating schemes' were launched and supported by the Department of Agriculture (DoA). When LEADER was introduced one of the criteria for support was that the LAG could not support a local farmer with LEADER resources if a national initiative was available. Over time this has caused a range of problems. Discussion and debate continues to happen on a case-by-case basis between the LAG and the two Government Departments involved. The LAG will facilitate as best as possible negotiations with the DoA on each case which involves the 'alternative' production, processing or other value added projects of agriculture produce but in all cases must first receive agreement with DoA before proceeding. Sometimes this is relatively straight forward and agreement is reached quickly but this is not always the case. In some cases, where there appears good reason locally to support a project, it can be disqualified from support due to 'national' rules, guidelines or regulations.

This has created a difficulty for LAGs and more importantly for farm families. Farmers Unions are often critical of the impact of the LEADER Approach based in part on frustrations of its members to access grants for projects. In reality this will become an even bigger issue as the impacts of the dismantling of CAP has a more profound impact on the incomes of the farming community. It will require an overall agreement on the issues involved between the Department of Agriculture and Department of Community, Rural & Gaeltacht Affairs rather than piece-meal discussions on a case-by-case basis.

There is however grounds for being confident that this issue can be tackled effectively by the officials from both Departments. For a number of years the Department of Agriculture had a scheme for 'Agri-Tourism' that supported farm based tourism. In 2000-2001 this was dissolved with the LEADER LAGs given responsibility for investment under 'Rural Tourism' which has seen a dramatic increase in the direct investment into this sector since the change was implemented. Farmers and farm families are an important element of the rural community and economy. As clients of the rural development programme they deserve to be supported locally and implementing the necessary changes to make this happen should be the priority of the Government and its relevant Departments.

Closing on the Future: The Prospects for LEADER going Forward?

Changing Times

As mentioned in the Governance Section there is currently a dramatic change being introduced to the LEADER Sector, which is being led by the Department of Community, Rural Gaeltacht Affairs and other Government Departments.

On one hand there will be a three fold increase in the LEADER Budget offered to groups from 2007-2013 with €425m being allocated for this period. This will substantially increase the 'LEADER' aspect of groups' budgets. Additionally the Department is merging the delivery of LEADER and the Local Development Social Inclusion Programme in every LEADER Partnership (LAG-Partnership) which will

bring a further €200m funding to be channelled through the groups. Further funding streams are being promised including the continuation of the Rural Social Scheme and a national roll-out of initiatives such as the Rural Transport Programme through the LAG Partnerships. There is also an EU 'LEADER Style' Programme being prepared for the Fisheries Communities with LAGs being asked to consider their role in its delivery in the coming years.
Beyond this however is the more fundamental change. LEADER started life as an 'experiment', a pilot project that didn't stop. However it had never been mainstreamed either at National or EU Level. It received excellent reviews. Politicians universally heaped praise on its achievements and its focus. But it never got beyond being a relatively small community initiative that was in real danger of being forgotten by the EU Commission and thereafter by each National Administrator. Most practitioners were of this opinion with national networks hosting conferences on the subject 'the impact of losing LEADER' across the EU. However something else was also happening at the same time. The EU Commission were beginning the process of dismantling the long standing farm support system, CAP. In their wisdom, as part of the new support system for the farm community, a new 'Rural Development Programme' was devised to be adopted by every member state. This has four 'axis' of support that are deemed central to maintaining a sustainable Rural Europe into the future - the fourth of these 'axis' is the 'LEADER Approach'. The 'Pilot' had finally reached its end and instead of disappearing into obscurity like so many others before it, this one looks like its going to be part of the process of rural development for a long time to come.

Credit Where Credit is Due

LEADER has been singled out as an approach which has brought the 'best out of people' at a local level maximising the impact of volunteering and attracting professionals from the state and private sector with a desire to make a real difference at community level. This can also be said of the officials in the Department of Agriculture and particularly of the Minister and Officials of the Department of Community, Rural & Gaeltacht Affairs. They have brought the complex variety of community based initiatives under one administration with a clear focus of maximising the impact of these investments by integrating their delivery through the LAGs. They and their colleagues across Europe and within the European Commission have brought the LEADER Approach to the centre of Rural Development Planning and Investment for every member state for the future.

Learning from the Real World

The presentation which will be delivered to support this paper will be based on the LEADER Approach as it has impacted on real people in the community from the farmer, craft worker or food producer to the community activists working with young people, the elderly or the unemployed.

THE EFFECT OF SOIL CONSERVATION ON OPTIMAL CROPPING PATTERNS IN KERICHO DISTRICT, KENYA

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Abstract

Production and consumption activities are directed by multiple and conflicting goals. The objective of this study was to determine the changes in optimal resource utilization patterns arising from soil conservation. A purposive sample of 150 farmers was selected from three administrative divisions of Kericho district. Questionnaires were used to collect primary data needed for analysis. Pre-emptive goal-programming model was used to determine the optimal cropping patterns. Results showed that out of 20 basic cropping activities identified in the study area, 20% and 10% entered the optimal cropping program in conserved and eroded areas respectively. Shadow prices for fully utilized resources indicated that cost of production decreased if additional units of the fully utilized resources were used. The non-fully utilized resources included land and hired labor. In conclusion, it was evident that given the present structure of available resources, average households in study area could not fully meet their household goals.

Keywords: Goal-programming, optimal cropping patterns, soil conservation

Introduction

Land degradation is a threat to sustainable production in agriculture-based poor economies. Farm families integrate production and consumption activities and a large proportion of agricultural output is consumed. Production and consumption activities are directed by multiple and conflicting goals operative in the system. Smallholder farms in many developing countries represent 95% of the total food crop farms and contribute 90% of total food crop output (FAO, 2004). Small-scale farms are known for low level of operation, illiteracy of operators and labor-intensive production (Okuneye and Okuneye, 1988). According to FAO (2004), 75% of labor demands in many African countries originate from the family.

Kenya's agricultural sector contributes about 25% of GDP, 60% of total earnings, 45% of government revenue and employs 80% of labor force while accounting for 80% of rural incomes (RoK, 2002). Soil erosion is a threat to agricultural production in many parts of Kenya (Kilewe and Thomas, 1992). Other constraints to growth in the agricultural sector include: poor farming practices and choices of enterprises, policy related disincentives for technology adoption, underdeveloped credit markets and low returns to farming (Feder *et al*., 1985).

Soil conservation was introduced in Kenya's Agriculture sector in the 1930s (Anderson, 1984). In 1938, a soil conservation service was formed. Soil conservation funding was advanced through African Land Development Board and Swynnerton Plan of 1950's. Coercive soil conservation was practiced (Tiffen *et al*., 1994). Kenyans later resisted soil conservation as they considered it part of a colonial plan to distract them from struggling for freedom (Thomas *et al.*, 1986; SIDA, 1993). After independence in 1963, soil conservation was given little attention as it was seen as a symbol of colonial oppression and colonial legacy (Ericksson, 1992; SIDA, 1993). Soil conservation structures were either destroyed or neglected. In 1974, soil conservation was reintroduced due to the negative effects of soil erosion in Kenya's agricultural sector (Pretty *et al.*, 1995). A Permanent Presidential Commission on Soil Conservation and Afforestation was formed in 1981 to create awareness about the need for conservation (Anyieni, 1986; Kilewe and Thomas, 1992).

Kericho District slopes westwards with a rough terrain and many rivers and streams. Climate is Highland Sub-Tropical with high and well-distributed rainfall and no real breaks between short and long rains. Mean annual rainfall ranges between 1000 mm and 1600 mm. The District is subdivided into 4 main agro-ecological zones namely Upper Highland, Lower Highland, Upper Midland and Lower Midland. Many organizations have done a lot of research and generated information on ability of soil conservation measures to provide technical solutions to soil degradation problems in the study area. Raising and sustaining agricultural productivity however is still a problem. A review of the existing body of knowledge reveals no studies on the economics of soil conservation in the study area (Kipsat, 2006). Lack of such information may mean that farmers are not sure whether long-term investments in soil conservation are justified (Shiferaw and Holden, 1997). The objective of this study was to determine the effect of soil conservation on farmers' optimal cropping and resource allocation patterns.

Methodology

Theoretical and Empirical Framework of Study

The farm household model assumes that farmers have many objectives focusing on welfare or profit maximization (Upton, 1987; Ellis, 1988; Scherr, 1995). Studies in sub-Saharan Africa (Upton, 1987; Mokwuye *et al*., 1996) reveal that in an effort to maximize utility, most farm households pursue a combination of objectives: securing provision of food and other subsistence needs, earning a cash income for purchase of outside goods and services, saving or accumulation of resources to meet future planned needs and emergencies, risk aversion, long-term security, and achievement of community status.

The basic structure of agricultural firm model is an adaptation of traditional agricultural firm models that assume inseparability of production and consumption systems (De Janvry *et al*., 1992 and Delforce, 1994). Farmers in this study were assumed to have three optimization goals namely: food security for the family throughout the year; accumulation of monetary income; and minimum use of hired labor or efficient use of family labor. Farmers' goals were assumed to be subject to limitations imposed by specific household resource constraints. The theoretical household model deal with optimization of goals and optimization implies efficiency (Baumol, 1977). In multi-product firms, the equimarginal principle is the neoclassical economic efficiency criterion for resource allocation.

Goal Programming (GP) technique is used to optimize a multi-objective problem that balances trade-offs in often conflicting unequal goals. Ranking and weighting various goals and their sub-goals based on their importance establish a priority structure that helps to deal with all goals that cannot be fully and/ or simultaneously achieved. More important goals are achieved first at the expense of less important ones. The decision-maker cannot achieve every goal to the desired extent, thus he attempts to achieve a

satisfactory level of all goals rather than optimal solution for a single goal. GP involve minimizing deviations from established goals within the set of constraints. The objective function is minimization of a sum of the deviations based on relative importance assigned to each deviation. The general linear GP model with *m* goals is given as:

$$\text{Minimize } Z = \sum_{i=1}^{m} \sum_{r=1}^{k} P_r (W_i \bar{d}_i + W_i \bar{d}_i)$$

Subject to the linear constraints

$$\sum_{j=1}^{n} a_{jj} X_j + d_i - \bar{d}_j = b_i; \; i = 1, 2, \ldots, m \qquad \text{equation 1}$$

$$\text{and } X_j = \bar{d}_i, \; \bar{d}_j, \geq 0 \text{ for all i and j}$$

$$\bar{d} + \bar{d} = 0$$

Where, Z is sum of deviations from all desired goals having *m* goal constraints and *n* decision variables, X_js. The W_i's are non-negative constraints representing the relative weight for deviational variables d_i, d_j for each goal constraints. P_r's are pre-emptive priorities assigned to the sets of goals that are grouped together in problem formulation. The a_{ij} are constants attached to each decision variable and the b_i's are the right hand side values (goals) of each constants.

To achieve multiple goals according to their importance, pre-emptive priority factors P_1, P_2,…, and so on is given to a goal deviation in formulation of the objective function to be minimized. P's do not assume numerical values but are a convenient way of indicating that one goal is more important than another. Priority ranking is absolute and the priority factors have the relationship of $P_1 >> P_2 >> \ldots >> P_k >> P_{k+1}$...., where >> means more important than. This means, $P_j >> nP_{j+1}$ (j =1, 2,…, K). Where n is a very large number.

A lower-priority goal will never be achieved at the expense of a higher priority goal. Two or more goals however may be assigned equal priority factor.

The objective in this study was to determine the farmers' optimal crop enterprise combinations that are able to meet a set of household objectives. The main objectives pursued by households in the study area were assumed to be: to provide adequate food to ensure at least minimum calorie for the household throughout the year; to earn adequate monetary income to at least meet minimum household financial needs and; to maximize utilization of family labour through minimum use of paid labour. The production systems were said to be optimal and sustainable only if they were able to provide adequate calorie intake for family throughout the year and to produce adequate monetary surplus to allow the household to acquire goods that were not being produced on the farm.

Farmers provided the prioritisation of objectives and pre-emptive weights. Pre-emptive weights were attached to these objectives based on the farmers' ranking. Indicators of sustainability and the deviational variable(s), d^- and d^+, were derived from the household characteristics.

The crop activities in model included: maize/tea; coffee/cotton/maize/kales; wheat/maize/pyrethrum; millet/cotton/coffee; tea/coffee; pineapples/coffee; tea/Pineapples; maize/wheat/millet/beans; wheat/maize/tea; cotton/coffee/pepper; maize/sunflower/pyrethrum; pyrethrum/tea/tomatoes; millet/maize; maize/beans; pyrethrum/sunflower/pineapples; millet/kales/maize/beans;

maize/wheat/beans; pineapples/pyrethrum/wheat; maize/sunflower/tea; sorghum/tomato/maize/cotton. Table 1 was the goal function structure of the basic goal-programming model.

Table 1: Objective Function Structure of a Basic Goal Programming Model

Farm family Production Objective	Goal Statement achievement	Goal Function Statement: to minimise	Goal function deviation variable	Priority Level	Pre-emptive Weights
(1) Farm household food security	i. Minimum maize intake	Underachievement	d^-	1	4
	ii. Minimum millet intake	Underachievement	d^-	1	4
	iii Minimum bean intake	Underachievement	d^-	1	4
	iv. Minimum wheat intake	Underachievement	d^-	1	4
(2) Limited labour cash expenditure	(i). Specified level of expenditure on labour	Overachievement	d^+	4	1
(3) Net farm income	i. Desired level of farm income	Underachievement	d^-	3	1
(4) Nutritional well-being	i. Minimum calorie intake	Underachievement	d^-	2	3
	ii. Minimum protein intake	Underachievement	d^-	2	3

Source: Results of Ranking and Weighting of Goals in this Study, 2003

Sources of Data Collected and Sampling Design

This study made use of primary and secondary data. Primary data was collected from farmers. Secondary data was obtained from publications, books and reports from research institutions. The indicator for adequate caloric intake came from WTO/ FAO adequate human caloric intake recommendations (FAO, 1974, 2004; Hamilton and Whitney, 1982; Goldman, 1994). The monetary income indicator corresponded to a minimum of 75% of the average household expenditure associated with the smallholder farmers in the study area. The labour saving indicator was represented by the desired level of cash expenditure on paid labour by smallholder farmers in the study area.

Purposive sampling was adopted in selecting respondents from three divisions: Londiani, Kipkelion and Sigowet of Kericho District. At least thirty households were selected from each division and data was collected from all soil conservation points in which 150 respondents provided data for this study.

Data Collection and Analysis

The data collection exercise was done between October and December 2003. Ten enumerators were chosen from each division and trained for the enumeration exercise. Questionnaires were pre-tested with a random sample of 40 farmers in Ainamoi Division, Kericho District. The questionnaires were orally administered to the respondents by the enumerators. Each questionnaire was first examined and assessed for reliability of data content in order to justify the content's inclusion in data analysis in this study.

Comprehensiveness and consistency of responses were used as selection criteria. The Linear Interactive Discrete Optimization (LINDO) software package was used to solve the pre-emptive resource allocation and multiple household goal attainment-programming problems.

Results and Discussions

The farmer's priority ranking showed that food security in terms of adequacy was first. Food security in terms of balanced diet was second. Accumulation of monetary income and limited expenditure on paid labour, through efficient utilization of family labour, were third and fourth respectively. Cost minimization was the underlying behavioral principle guiding farmers in resource allocation decisions. Out of 20 basic activities included in the model, 4 (maize/bean; maize/beans/millet; millet/maize/wheat and maize/sorghum/beans) entered the program in areas where soil conservation was practiced. Two cropping activities (maize/bean and maize/beans/millet) entered the programme in farms where soil conservation was not practiced. Table 2 presents results of pre-emptive goal programming that was constrained to use minimum cost possible to yield the minimum household food requirements. The program value or cost that would be incurred for the optimum farm plan to be executed was kshs. 64851.60 ($900.7).

Table 2: Crop Activities and Acreages in Conserved and Degraded Areas

Basic Cropping Activity	Acreage Allocations (Acres)	
	Conserved Soil	Degraded Soil
Maize/Beans	0.4	0.9
Maize/millet/beans	0.1	0.2
Maize/beans/tea	3.0	-
Maize/wheat/beans	2.35	-

Source: Summary Computer Printout Results of Goal Programming Model

The results above showed that the four enterprise combinations that entered the program in farms with conserved soil were maize/bean/tea (3 acres), maize/wheat/beans (2.35 acres), maize/beans (0.4 acres) and maize/millet/beans (0.1 acres). Two enterprise combinations, maize/bean and maize/millet/beans with acreage allocations of 0.9 and 0.2 acres respectively entered the pre-emptive goal program in degraded farms. Soil degradation affected resource requirements in that more land was needed to meet household production and consumption goals.

All resources except land were fully utilized in conserved areas. Planting and harvesting periods in the study area were associated with shortages of labor and most family members worked on the farm. Labor problems were severe in farms where soil conservation was practiced. As expected, more frequent farm household allocation decisions are made about labor than about all other resources combined. The problem of labor was being addressed by use of catchment approach to soil conservation. In this approach labor from several households was pooled and used to conserve soil in one region or farm at a time. The development of credit markets and government and NGO subsidies go a long way in addressing the problem of capital constraints. Table 3 provides summary results for resource allocations and use patterns among the sampled households in the study area.

Table 3: Household Resource Allocation and Use Patterns in the Study Area

Resource	Use Status in Degraded and Conserved Farms	Slacks for Degraded and Conserved Soil	Shadow price (MVP)
Land	Fully utilized (Not fully utilized)	None (5.825 acres)	20.8 (-)
Period 1 (March- June) family labor	Fully utilized (Fully utilized)	None (none)	1.45 (2.1)
Hired labor for period 1	Fully utilized (Fully utilized)	None (none)	1.6 (2.8)
Period 2 (Aug-Nov) family labor	Fully utilized (Fully utilized)	None (none)	0.7 (0.5)
Period 2 (Aug-Nov) hired labor	Not fully utilized (Fully utilized)	44.65 man-days (none)	- (2.2)
Cash paid labor	Not fully utilized (Fully utilized)	$38.2 (none)	-(2.4)
Cash on material inputs	Fully utilized (Fully utilized)	None (none)	2.2 (19.4)

Source: Computer Printout of Goal Programming Model

The figures in brackets in table 3 above are associated with farms with degraded soils. Resource utilization patterns showed that land, family and hired labor during period 1, family labor for period 2, and cash on material inputs were fully utilized in arriving at the optimal solution to the goal-programming problem in degraded farms. The non-fully utilized resource in conserved farms was land (5.825 acres) while hired labor for period 2 (44.65 man-days) as well as the cash paid labor ($38.2) was slack in degraded farms. Slack resources refer to factors of production that were in excess of the actual needs of the household in the specified period. The shadow prices for the fully utilized resources in degraded farms were $ 20.8, 1.45, 1.6, 0.7 and 2.2 for land, period 1 family labor, period 1 hired labor, family labor for period 2 and cash on material inputs respectively.

The shadow prices for the fully utilized resources in conserved farms were family labor period 1($2.1), hired labor period 1($2.8), family labor period 2($0.5), hired labor period 2 ($2.2), cash paid labor ($2.4) and cash on material inputs ($19.4). The shadow prices for the fully utilized resources indicate the decrease in cost of production if additional units of such resources were used. This meant that farmers practicing soil conservation would benefit from additional units of labor and capital. Table 4 gives the results of marginal opportunity cost of non-basic activities in the study area.

Table 4: Marginal Opportunity Cost of Non-Basic Activities

Non-Basic Activity	Marginal Opportunity Cost (MOC) in kshs ($)
Maize/tea	36724.60 (510.06)
Millet/cotton/coffee	17963.50 (249.49)
Pineapples/tea	24260.40 (336.95)
Maize/sorghum/beans	24819.70 (344.72)
Maize/sunflower/pyrethrum	3983.40 (55.32)
Wheat/maize/pyrethrum	27704.80 (384.79)
Sorghum/tomatoes/cotton	48316.00 (671.06)
Beans/wheat/tomatoes	1926.90 (26.76)
Tea/coffee	6813.70 (94.63)
Wheat/maize/tea	6886.50 (95.65)
Pineapples/coffee	30967.70 (430.11)
Maize/ wheat	18256.80 (253.57)
Sorghum/tomatoes/cotton	48316.00 (671.06)
Coffee/cotton/maize/kales	39129.90 (543.47)
Pineapples/pyrethrum/wheat	12354.20 (171.59)
Millet/beans,	9816.70 (136.34)

Source: Summary of Computer Printout Results in this Study

MOC indicated the amount by which the program value would increase if any non-basic activities (not currently in the system) were introduced into the program. Optimal production cost would increase by the margin equal to MOC value of excluded activities. Table 4 showed that sorghum/tomatoes/maize/cotton had the highest MOC of kshs 48316($671). Beans/wheat/tomatoes had lowest MOC of kshs 1926.9 ($26.8).

Annual family food supply depends on productivity of land, labor and variable capital inputs, adoption of technologies and favorable climate. Others are government policies, laws, regulations and institutional environment. Family labor was allocated to farm production, off-farm wage employment and leisure. Accumulation of cash income goal targeted maximization of net family earnings. Financial constraints facing farmers limited purchase of additional inputs and prevented long term investment and generation of physical capital.

Summary and Conclusions

Optimal allocation patterns depicted that soil conservation improves land, labor and capital productivity. More enterprise combinations entered the program in conserved than in degraded areas. The allocation patterns indicated inefficient use of resources among farmers who did not practice soil conservation. Some resources (land, labor and capital) were not fully utilized. Except for land, farmers who conserved soil used resources efficiently. Given the available resources farmers could not fully satisfy their production goals.

Recommendations

Mixed cropping pattern, mainly cereal-legume based, should be promoted since they greatly contribute to household income and food security goals. Suitability of cropping patterns should be assessed in terms of

effect on soil stability and erosion risk. High and rising population pressure has caused people to encroach into forests and wetlands in the region. Lands earmarked for forest and grazing had been converted into cultivation due to the increasing demand for land. Settlement schemes subdivision and allocation was done without proper land use planning. Government policies on land use planning should therefore be implemented in the study area.

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TOWARDS A RURAL LAND USE PLANNING FRAMEWORK FOR THE AGULHAS PLAIN, SOUTH AFRICA

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Abstract

The Agulhas Plain lies at the southern-most tip of Africa and falls within the Cape Floral Kingdom. It covers an area of approximately 2 160 km2 of coastal lowlands and low hills. This exceptionally species-rich area has been severely fragmented by alien plant infestation, agriculture and urban development. In order to guide conservation efforts whilst addressing the socio-economic needs in the area, a process of rural area-wide planning has commenced in the region. This is carried out by the Landcare division of the Department of Agriculture in partnership with conservation authorities, farmers, local government and communities. Agritourism is identified as a high- potential industry in this region. In order to guide decision-making, an intensive data-collection exercise has commenced, whereby land use on the Plain is being mapped at 1:10 000 scale and relevant information is collated in a Geographic Information System (GIS). This paper will examine the role which GIS, spatial data and associated technologies play in the project – and specifically how the information generated is made relevant and accessible to regional planners and indeed all role players.

Key words: Geographic Information System, rural development, spatial planning, rural planning, agritourism.

Introduction

There is currently an urgent requirement for more detailed rural data in the Western Cape region of South Africa and particularly in the Agulhas Plain region due to the following issues:

1. This exceptionally species-rich area has been severely fragmented by alien plant infestation, agriculture and urban development. Bioregional conservation projects such as C.A.P.E (Cape Action for People and the Environment), which are multisectoral programmes that provide a collaborative conservation action (Driver *et al*, 2004).
2. The decentralisation of rural management authority from province to local municipalities. Each municipality is required to produce a Spatial Development Framework which informs development planners across a wide range of affiliations and levels of government.
3. The redressing of former inequalities in land ownership.
4. LandCare: LandCare Areawide Planning is a comprehensive problem solving process that integrates social, economic and ecological concerns over defined geographical areas. This process strives to sustain and improve environmental health through a natural resource management approach that integrates locally driven initiatives (Steyn, 2003).
5. Conservation Stewardship programmes amongst private and communal landowners which involves increasing the capacity of provincial conservation agencies to work outside of formally protected areas (Driver *et al*, 2004).
6. Working For Water programmes of the Department of Water Affairs and Forestry (controlling invasive alien species).
7. The development and promotion of new industries to boost local economies – for example agritourism.

All of these require a well planned base data set from which to draw regional spatial statistics, examine the *status quo* in terms of land use and to form the base for monitoring, planning and reporting.

Inevitably each agency has its own set of data requirements on which to base such decisions. It is generally acknowledged that most of the existing data is at too small a scale to be used effectively in local planning. In the Western Cape a project was initiated by Landcare to map the land use *status quo* at a scale of 1:10 000. Fundamental to the success of planning at this scale was the acquisition of a set of digital colour orthophotos provided by DWAF to be used as a base dataset. New high-resolution satellite images provide a viable alternative for areas where aerial photography is not available.

Process

Status Quo Mapping

The fundamental "*status quo*" categories for rural planning support are (H. Germishuys, personal communication):

1. *Intensive* agriculture: these are areas which are ploughed or cultivated.
2. Areas where natural vegetation remains, also referred to as *extensive* agricultural areas. These may consist of pristine natural vegetation and may be utilised for grazing.
3. *Waterways*, including riparian vegetation.

Fundamental planning goals may differ in different areas according to regional priorities, but this first step is required as a reference point. Each category may then be subdivided according to the needs of each agency or region. Because of the multi-agency nature of the GIS work, it is vitally important that *common standards* are established and adhered to, to prevent duplication of effort and to facilitate the overlay and analysis of disparate datasets within the GIS framework.

The Landcare data capture methodology was initially carried out as follows.

1. The digital orthophoto is printed (at 1:10 000) and laminated.
2. Cadastral boundaries are overlaid on the map.
3. The Landcare officer demarcates areas in the above categories using coloured marker pens.
4. The maps are brought into the GIS office for digitizing.

It became evident that very stringent specifications must be included in contracts for the capture such data to ensure that data is captured topologically correctly. Step 3 was problematic in that each field worker delineated riparian areas slightly differently depending on their own interpretation.

Subsequent steps may require field verification and farm visits to add details on a farm scale, such as

1. Current land use (i.e. wheat, vineyards, fruit orchard type)
2. Future development plans
3. Priority conservation areas and endangered species.

These data then need to be made available to other agencies to add their specialist input.

It has recently been acknowledged that due to the increasingly high demand for land use data and the enormity of the task of mapping at the required scale, that this process will be fast-tracked through a tender process to capture agricultural land use data at a 1:10000 scale for the whole province.

Agritourism is recognised as the ideal activity to capitalize on the expected growth in tourism numbers in the Western Cape (Nowers, 2006). Some of its advantages are:

- It stimulates entrepreneurship, creates and broaden job opportunities for farm families and surrounding rural communities;
- Agritourism combats the depopulation of rural areas;
- It creates direct connections with consumer patterns in terms of value-added products of origin which can be purchased direct from the farm – it also influences consumer preferences and may develop export markets;
- It improves the image of agriculture and enlightens visitors on agricultural related issues – particularly important in the Agulhas region, being a biodiversity "hot-spot";
- It is an established industry that has a sustainable demand. It however needs to be continuously co-ordinated and stimulated if it is to develop to its full potential. Farm accommodation had in 1996 a two percent share in the local tourism market and in the Western Cape alone some ten percent of foreign tourists make use of farm accommodation.

A survey was undertaken in the region to map and analyse data from all agriculturally related tourist activities in the region and the data. This data can then be analysed spatially in the GIS, for example in conjunction with demographic data, tourism routes etc.

Field Data Capture Technologies

A number of methodologies were investigated to facilitate the capture of digital data in the field. PDAs and tablet PCs with integrated or blue-tooth GPS units and GPS units with GIS software all provide potential solutions. The size of screen on the tablet PC together with "mobile GIS" and "digital ink" technology make this an attractive solution. Sketches and notes created on a Tablet PC are geographically referenced and can be saved as (georeferenced) map graphics or as annotation in the geodatabase. However, it is preferable to purchase a ruggedized tablet with a bright screen to cope with field conditions which entails a substantial financial outlay. The obvious implication of introducing this technology is that field officers will be required to have a reasonable level of GIS skill.

Information Flow and Data Warehousing

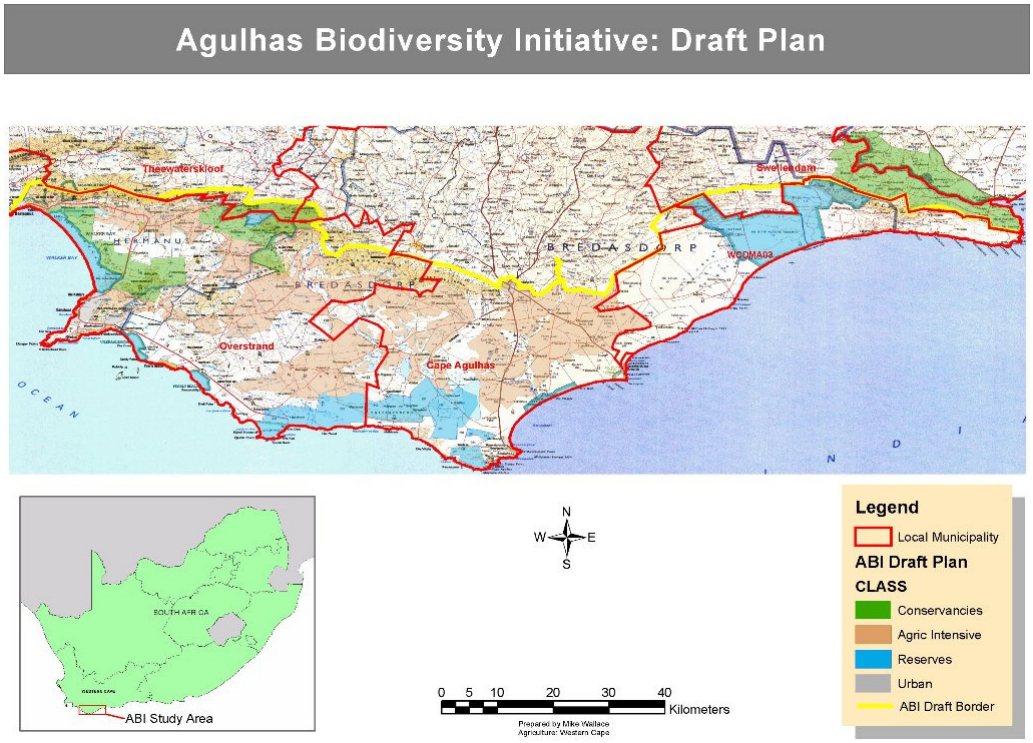
GIS data centralization in some form is essential in order for integrated planning and decision-making to occur as envisaged. This provides a number of challenges in the multi-agency context. Issues of data sharing, custodianship, updating of data and data access can become stumbling blocks in the context of multi-agency involvement. The ideal of a central data warehouse for all relevant spatial information in a region is extremely difficult to achieve in practice in the SA context. At present much of the success in this regard revolves around interpersonal relationships and "networking" amongst the various GIS role players and end users. Some data warehousing is currently provided through the SA National Biodiversity Institute's web portal: http://bgis.sanbi.org/ but the integration of biodiversity, agricultural, economic and administrative spatial data within one portal is still required. A model such as that developed by DEFRA in the UK (http://www.magic.gov.uk/projectsummary.htm) to provide a 'one-stop shop' for rural and countryside information is being proposed for local development.

The Agulhas Biodiversity Initiative (ABI) and GIS

ABI is a project under the C.A.P.E banner. The Agulhas plain is a hotspot of threatened biodiversity, and as such has been the focus of a number of specialised studies. Most of the ABI study domain has been subjected to a detailed botanical survey, where the resulting GIS data has been key to planning and development in the region. The botanical survey (Cole, *et al,* 2000) was captured at a 1:10 000 scale, providing a useful reference for initial fine scale planning in the region, whilst the "*status quo*" mapping

discussed previously is currently almost completed. Some 70% of this region is covered by colour digital orthophotography as shown in figure 5.

Figure 5: The ABI Project Area.



For areas where digital 1:10 000 orthophotography is lacking, the use of Quickbird (pan-sharpened) imagery has been investigated as a viable alternative. The Department of Agriculture has also recently acquired a full set of SPOT® imagery, which provides a full coverage of the area at 2.5 m resolution.

Using the Cole *et al* data (2000) and subsequent manipulations of this data by Holness (2003) the GIS provided a useful reporting tool. Spatial statistics regarding various conservation indicators could be extracted from these data to monitor and plan progress in achieving conservation targets according to the ABI planning, monitoring and evaluation framework (Logframe).

Conclusion

Through the projects discussed above, a number of stumbling blocks were identified which have slowed the GIS spatial data gathering process. A number of needs have been identified which would result in improved data capture and information flow. Some of the key needs identified are:

1. A farm boundary database with farmer/ownership details. Although the (GIS) cadastral data is available from the Surveyor General, it does not indicate actual farming units.
2. A co-ordinated effort by various government organisations to periodically capture and update a series of 1:10 000 colour digital orthophotos (or high resolution satellite imagery) to be used as base data for fine scale planning.
3. Efficient integration of and access to planning data from all spheres of involvement. An excellent example of how this could potentially be done can be examined at the website www.magic.gov.uk.
4. Improved band width for on-line data access.

5. Stringent and carefully considered specifications and standards need to be included in contracts to ensure good quality GIS products are obtained from data capture agencies.
6. Common standards and data dictionaries to ensure a consistent frame of reference.

In a world where specialization is the order of the day, in agriculture, diversification is the key towards reaching sustainable agricultural goals. In the midst of changing climatic patterns, adverse weather phenomena, and inter- and intra-regional competition for markets and resources, farmers and planners increasingly need to identify value-adding possibilities to increase the sustainable level of farm profit. The optimal utilization of scarce natural resources also dictates the wise use of these resources. Agriculture in the Agulhas region has a wide range of resources which are not suitable for traditional farming practices and which provide the entrepreneur with access to various opportunities to use these resources in such a manner that it is sustainable on the one hand, whilst adding value to the net farm income.

GIS is well established as an indispensable tool for such spatial planning, resource management and reporting. The challenge for the future is to improve accessibility and promote co-ordination of effort amongst all users in a multi-agency planning context. Regarding responsible and sustainable land use management - even the best spatial data, maps and guidelines do not lead to effective action unless they are "mainstreamed" (Driver *et al*, 2003). In other words they must be readily available to all land owners and land-use decision makers and incorporated into policies and actions from a regional to national level. The effective and integrated implementation of regional, multi-agency GIS should play a significant role in supporting this objective.

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FARMING CARBON IN AUSTRALIA

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Abstract

The clearing of farming land over the last four hundred years has released large quantities of carbon dioxide into the atmosphere. This clearing and the subsequent decline in organic matter is estimated to have contributed almost twice the carbon released from fossil fuel use since 1850. The big opportunity is to reverse the decline of soil organic matter - storing carbon and the same time improving soil productivity. This potential to store carbon in Australia is lower than in temperate areas, such as the USA, where ten long-term studies of no-tillage show an increase of 0.6 t.carbon/ha/yr. A good outcome in Australia is a gain of 0.1-0.15 t. C/ha per year. While useful and much better than releasing carbon, this is not enough for farmers to receive a significant 'carbon credit' payment. Storing carbon is a win-win situation however – with improved organic matter resulting in better soil health and contributing to better crop yields. Saving energy on farms is also more profitable while reducing greenhouse emissions. A "Farming Carbon" program is being conducted by the author with 50 farmers in Queensland, helping them to monitor soil organic matter and discuss farming practices which can sequester carbon and save energy.

Keywords: carbon, energy conservation

Introduction

Farming has caused a serious decline in soil organic matter, which affects on productivity and at the same time contributes to atmospheric carbon levels and potential climate change.
There is an opportunity to reverse the decline of soil organic matter - storing carbon and at the same time improving soil productivity.
Storing carbon is a win-win situation, with improved soil health contributing to better crop yields. Some of the same practices also result in energy savings on farms, which is also more profitable while reducing greenhouse emissions.

Greenhouse Gases and Climate Change

The Intergovernmental Panel on Climate Change (IPCC) outlined in its Third Assessment on Climate Change in 2001, that carbon dioxide levels have risen substantially over the last 200 years and that climate change is now occurring as a result of an increase in global temperatures, most likely caused by an increase in carbon dioxide and other greenhouse gases in the atmosphere.

A Fourth Assessment Report is currently being completed and a *Summary for Policymakers* released in April 2007 (IPCC 2007) reported that: "Observational evidence from all continents and most oceans shows that many natural systems are being affected by regional climate changes, particularly temperature increases."

This summary concluded that a moderate increase in temperature will increase the potential for food production globally, but as the average temperature increases over a range of 1-3°C, it is projected to decrease.

However, food production in warm climates like Australia may not benefit from higher carbon dioxide levels and a small rise in temperature. The IPCC summary report projections are for production from agriculture and forestry to decline by 2030 over much of southern and eastern Australia, due to reduced precipitation, increased drought and fire.

Agriculture a Major Contributor to Global Carbon Dioxide

The clearing of farming land over the last four hundred years has released large quantities of carbon dioxide into the atmosphere. This release and the subsequent decline in organic matter and loss of carbon by other means, has been estimated (Lal 2004) to have contributed more carbon dioxide to the atmosphere, around 456 gigatons (Gt), than the 270 Gt estimated output from fossil fuel combustion since 1850. See table 1.

Table 1: Loss of carbon from farming land

Source	Carbon emission (Gt)
Pre-industrial crop lands	320
Post Industrial (1850-2000)	
- land use conversion	78
- soil erosion	26
- mineralisation of OM	52
Total loss from farm land conversion and farming	**476**
Fossil fuel use since 1850	**270**

Source: Lal 2004

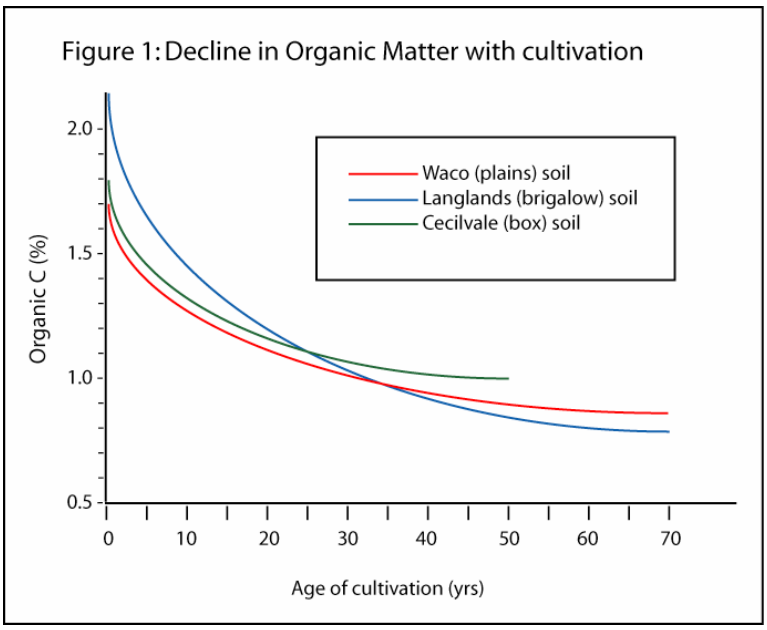
There is significant potential to reverse the decline of soil carbon according to Lal. The global soil C pool of around 2500 Gt is 3.3 times the size of the atmospheric pool (of 760Gt) and the carbon sink capacity is around half of the historic carbon loss of 42 to 78 Gt. Farming land has the potential to offset fossil fuel emissions by storing 0.8 gigatons (Gt) of carbon per year, or around 10% of global fossil-fuel emissions.

At the same time this will help achieve the 50% increase in crop yields required between now and 2050 to feed the world. An increase of 1 tonne of soil carbon/ha is estimated by Lal to increase crop yield by 20-40 kg/ha. Lal says the increase in crop yield can be much higher than this on degraded soils where water intake is improved by increasing organic matter.

Decline in Soil Organic Matter

Soil organic matter (SOM) has declined by around 50% over 50 to 100 years of cropping on clay soils in northern Australia. See Figure 1. This has important impacts on soil structure and nutrient supply. Increased rainfall runoff and reduced crop production can set off a cycle of decline, which results in reduced biomass being returned to the soil and a faster rundown in soil organic matter.

Figure 1: Decline in Organic Matter with Cultivation



Source: Redrawn from Dalal and Probert 1997.

Practices Which Build Soil Carbon

Farming practices which build rather than deplete soil carbon will not only reduce greenhouse emissions, they will improve soil health and productivity. Practices which enhance organic matter will maintain or improve soil structure, provide good conditions for soil biota, improve the soil water balance and the productivity of soils over time.

1. High Yield - High Biomass Crops

Wheat is the main dryland crop in Australia, but in the northern cropping areas, grain sorghum is important and will produce around 1.5 times the biomass of wheat and twice the biomass of dryland cotton and chickpea. Growing high yielding crops of sorghum has been shown to build SOM, while dryland cotton grown after a long fallow, combined with tillage for pupae busting is likely to deplete it.

2. Eliminate Tillage

In ten long-term studies of no-tillage in the USA an increase of 1.08t/ha/yr of SOM (0.6 t/ha C) was measured, compared to a decline of 0.3t SOM/ha/yr where ploughing was used (Reicosky 2001).

The effects of zero-tillage are less in Australia, because the potential to store carbon is lower than in the USA. Rainfall is generally lower (with lower biomass input) and there is a longer period of warmer weather during the year for mineralisation of SOM.

Freebairn (1998) reviewed tillage trial data for clay soils in northern Australia and found that zero-tillage was able to halt the decline in SOM, while one or more cultivations a year (minimum or reduced tillage) is likely to result in a continuing decline in SOM. Freebairn acknowledged that most of the tillage trials involved wheat. Some farmers in high yielding sorghum growing areas have measured increases in SOM with zero-tillage.

Chan (2003) reviewed field trials on conservation tillage on light textured soils in southern Australia and found zero-tillage could increase soil organic carbon levels only in the higher rainfall areas (>500mm). In the drier areas, soil organic carbon continued to decline, even under conservation tillage.

However some increases in SOM with zero-tillage have been reported by farmers in lower rainfall areas. One example is from Hyden in Western Australia, where monitoring of a number of paddocks over the period: 1994 to 2001, showed an average increase from 0.7% Organic Carbon to 1.2% OC when zero-tillage was used (Crabtree 2002).

While zero-tillage is essential to building SOM, it also has other effects on minimising greenhouse gases. Fuel use is reduce from 76 to 46 litres per hectare in cropping systems in southern Queensland (Tullberg and Wylie 1994) and in conjunction with controlled traffic, zero tillage will minimise compaction and reduce emissions of the greenhouse gas nitrous oxide. This loss of nitrous oxide mostly occurs on flat land. Zero-tillage reduces surface ponding after rainfall, which results from a plough pan or compaction layer below the cultivated depth.

3. Maintain Soil Fertility

A decline in soil fertility will reduce crop biomass and carbon input. Less ground cover is produced by nutrient limited crops, which in turn may result in less moisture stored and lower yields from subsequent crops. There has been a general increase in nitrogen fertiliser use in northern Australia, but applications are still much less than crop removal.

One of the problems of soils with low organic matter is that there is not enough organic N reserves to mineralise extra N to help produce big yields in years with good rainfall.

4. Feedlot, Pig and Poultry Manure

Animal manures can not only add nutrients more cheaply than mineral fertilisers, they also add useful amounts of organic matter.

Around 1.2 million tonnes of feedlot manure is produced in Australia each year, along with half a million tonnes of pig and poultry manure. The proportion of grain production used for animal feed continues to increase and have reached the point where exports of grain from eastern Australia are now less than half of total production. Use of animal manure will reduce the need for artificial fertilisers, add to soil carbon and boost soil fertility and soil health.

Farmers are often concerned that manure is difficult to manage compared to fertiliser. The use of manure can be simplified by applying it as a phosphate (P) fertiliser. If the optimum application of P is considered to be 8 kg P/ha/yr then an application of 10 tonnes of aged manure will apply 70 kg P/ha and last up to 8 years. Used in this way there is adequate potassium (K), but nitrogen needs to be boosted with other fertilizers, depending upon the mix of grain and legume crops and their yield and nitrogen demands.

5. Pasture Leys Will Build SOM.

A grass-legume pasture can build soil carbon levels by more than 1 t/ha/yr which could lift the organic carbon level in a typical soil by 0.05% p.a. Perennial grasses grow a big root system which contributes to below ground SOM return as well as surface litter.

In drier cropping areas it is common to use pasture leys of 3 to 4 years to restore fertility (boost nitrogen from legume input) and organic matter on rundown cropping soils. Excessive tillage should be avoided at

the end of pasture phase, or much of the added SOM will be rapidly depleted.

6. Maximise Crop Frequency

In northern Australia, which receives both winter and summer rainfall, it is possible to grow more than one crop per year, in years of above average rainfall. In some cropping systems, particularly in dry years, long fallows are used, where the time interval between crops is more than 6 months. Cropping sequences with high crop frequency are likely to add more biomass and build carbon much better than cropping systems which have long fallows and low crop frequency.

Dryland cotton is generally grown after a long fallow and with low biomass input. Planting wheat as a double-crop after dryland cotton and using feedlot manure can offset some of the potential depletion of SOM.

What is a Good Level of Soil Carbon?

Firstly we should be clear about the difference between soil carbon and SOM. SOM is the organic fraction of the soil, exclusive of undecayed plant and animal residues. This is often referred to as humus, except that humus does not include soil microbial biomass.

In practice, SOM is measured as soil organic carbon (SOC) and includes all plant and animal residues, living or dead microorganisms, charcoal *and* humus. To convert SOC to SOM we multiply by 1.724.

The optimum level of soil carbon will depend upon the age of the cultivation and the rainfall, which affects biomass input. Most organic matter (apart from charcoal) is in a constant state of turnover, where it is decomposed and replaced by fresh litter or soil fauna over a short time period of 3 to 4 years.

The level of organic matter in the soil is in a fluid relationship between the amount of carbon being added and the rate of decline. In sub-tropical areas of Australia, the rainfall can produce a reasonable biomass input, but the high temperatures and mineralisation which can occur over the whole year results in a rapid rate of decline.

Organic carbon levels in soils in southern Queensland where rainfall is 600-700mm, often start around 2% and decline to around 1% after 50-80 years of cultivation (Figure 1). It is difficult to build OC back up, but with good management and high yielding crops, such as grain sorghum, a SOC level of 1.2-1.5% may be possible.

Further west, where rainfall is typically 500-600 mm, initial levels of SOC may be high due to the inputs from brigalow scrub or other native vegetation, but it is more difficult to maintain organic matter because crop yields and biomass input are lower and SOC levels of 1-1.2% appear more sustainable.

In southern Australia, it may be possible to maintain higher SOC levels in dry cropping areas, because the summer period (when high temperatures can cause rapid breakdown of SOM) is usually dry. It appears possible to maintain SOC levels of 1.2-1.5% at lower rainfall levels (350-400mm) than in southern Queensland. Optimum levels of SOC can rise above 2% where rainfall is in the vicinity of 500mm.

Carbon Credits for Good Practices

Good practices will halt the decline in soil carbon and in some cases a small increase may be achieved. The increase in levels involved are likely to be too small to provide any income from carbon credit schemes. Some tillage trials and soil carbon measurements have shown a gain of 0.1-0.15 t of carbon per ha per year may be possible in the northern grain belt. While useful and much better than releasing

carbon, if carbon offsets were valued at $20/tonne of carbon, then the payments would be $2-3/ha and likely to be less than the cost of monitoring and administering a carbon credit program.

As mentioned earlier, zero-tillage may provide additional greenhouse gas savings by reducing energy inputs in farming and the outputs of nitrous oxide. This could add to the carbon credits, but the total value is still quite small. There is however plenty of incentive to build soil carbon if it results in better moisture storage, better nutrient reserves and higher crop yields. Farming carbon can provide a win-win outcome with improved farm profitability *and* a reduction in greenhouse gases.

Farming Carbon Program

The author of this paper is involved with several groups of farmers, totaling 50, in a *Farming Carbon* program, which aims to help them understand soil organic matter and best practices for increasing it. Small group discussions are held on farms each year. Organic carbon has been measured at two or three sites on each farm and three years of crop records were collected. The sites will be resampled at three years (in 2008) and compared on the basis of six years of crop and fertiliser records. The spread of farms and practices may show some differences in the balance of SOM in accordance with crop yields and fertiliser inputs or nutrient balance.

The study will provide further information on the practicality of improving and measuring any improvements of soil carbon over a three year time frame and how farmers in Queensland might contribute towards a lowering of greenhouse gas emissions or a storage of carbon.

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AGRICULTURE AND AGRI-FOOD CANADA'S BENCHMARK FOR SUCCESS 2006

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Abstract

Benchmarking can be a major tool to help improve the performance of individual farm operations. It helps the farm manager identify strengths and weaknesses, make better business decisions and take advantage of future opportunities. Agriculture and Agri-Food Canada has developed an innovative and unique interactive tool that allows producers to compare the financial performance of their farm with that of other Canadian operations similar in size, type and region. The tool guides producers through the completion of simplified income statements and balance sheets. From the information provided by producers, a series of financial ratios are calculated for their farm operation and compared against industry benchmarks for three ranges (i.e. top 25%, mid-point and bottom 25%). This comparison is provided for five categories of financial ratios: efficiency, liquidity, debt management, asset management and profitability.

The tool has the following characteristics:
- ***Ability to input up to five years (1999-2003) of financial information***
- ***Access to up to five years of financial industry benchmark information***
- ***Graphics to display trend, and combined benchmarking and trend analyses***
- ***Industry benchmarks for 14 regions of Canada, 10 commodity groups and 8 income categories***
- ***A financial tutorial that explains how to use the tool and defines financial terms and ratios.***

This applied paper provides specific information about this tool and, through full examples, shows how this financial tool works.

Key words: Agriculture benchmarking, financial ratios, farm business management.

Introduction

In Canada, as in other countries, farm managers operate in a business environment that presents them with significant fluctuations in both input costs and output prices. These and other uncertainties over which farm managers have little control exacerbate the general business challenge of forecasting future earnings and controlling costs and revenues. It is therefore crucial for producers to manage their resources in the most efficient way in order to achieve their goal of profit maximization.

Benchmarking a farm's financial performance against the performance of other farms is a powerful farm business management tool that a farmer can use to identify his or her operation's financial strengths and weaknesses and thus to make sound business decisions. Yet, only 34% of Canadian farmers surveyed in 2003 used such a business tool. Production benchmarking, another business management tool, was used by a much larger percentage of farmers: 52% (Source: Agriculture and Agri-Food Canada, 2004 National Renewal Survey: Business Management Practices of Agricultural Producers).

To empower more Canadian farmers to apply financial benchmarking to their business management practices, Agriculture and Agri-Food Canada (AAFC) provides farmers with an interactive tool: "Benchmarking for Success", both from a web-based and a CD platforms. First released in 2003, the tool was upgraded in 2006 to reflect user-defined improvements.
The purpose of this paper is to describe Benchmarking for Success 2006, provide specific information about the tool and show how the tool can be used by farmers.

The Benchmark for Success 2006 Tool

The Benchmark for Success 2006 tool has been developed by AAFC with the assistance of a private consultant (Instrux Media) to help producers compare the financial performance of their farm with that of other farms of similar size, type and region.

The tool is free, easy to use and available in French and English. It guides producers through the completion of simplified income statements and balance sheets. From the information provided by producers, a series of financial ratios are calculated for their farm operations and compared against industry benchmarks calculated for three ranges (i.e. top 25% of farms, mid-point and bottom 25%). This comparison is provided for five categories of financial ratios: efficiency, liquidity, debt management, asset management and profitability. Information can be entered for multiple years to conduct a trend analysis, which assesses the operation over time.

The tool has the following characteristics:
- Ability to input up to five years (1999 – 2003) of financial information for their farm.
- Access to up to five years of financial industry benchmark information (1999-2003). Data for 2004 will be available in July 2007.
- Industry benchmarks for 14 regions, 10 commodity groups and 8 revenue categories.
- Graphics to display trend, and combined benchmarking and trend analyses.
- A financial tutorial that explains how to use the tool and defined financial terms and ratios.
- Capacity to securely save the financial data entered into a separate profile and create multiple profiles.

Data Sources

The industry benchmark data used in the tool are derived from Statistics Canada's Whole Farm Database which includes The Taxfiler Database and the Farm Financial Survey (FFS).

The Taxfiler Database is made up of annual sampled records from the Taxation Data Program and the Canadian Agricultural Income Stabilization (CAIS) program. The Taxfiler Database includes detailed revenues and expenses data for unincorporated and incorporated farms with reported annual revenues of $10,000 and more. Data are reported on a cash basis.

Table 1: Sample Size of the Taxfiler Database, 1999 to 2003 (# of records)

Year	Unincorporated	Incorporated	Total
1999	127,695	10,764	138,459
2000	132,824	9,984	142,808
2001	141,767	11,634	153,401
2002	142,263	12,974	155,242
2003	133,253	13,234	146,487

Source: Statistics Canada, Whole Farm Database Reference Manual, Catalogue no. 21F0005G1E, 2006.

The Farm Financial Survey (FFS) is an annual survey[1] conducted by Statistics Canada. The survey collects data on assets and liabilities of farms with gross revenues of $10,000 and over. Assets are reported at their current market value.

Table 2: Usable Sample Size of the Farm Financial Survey, 1999 to 2003

Year	Unincorporated	Incorporated	Total
1999	9,919	3,539	13,458
2000	N/A	N/A	N/A
2001	9,674	3,557	13,231
2002	9,492	3,724	13,216
2003	10,902	4,521	15,423

Source: Statistics Canada, Farm Financial Survey

To maintain confidentiality and data quality, industry comparative data are suppressed when the population and the sample size is too small (as is the case with Newfoundland and Labrador). Statistics Canada requires that results be suppressed for a benchmark ratio if the estimates are based on a total population of less than 100 farms. There must also be a minimum of 26 farms in the sample set and a minimum of 20 farms in any population subset. In addition, a sample set is suppressed if the coefficient of variation shows that the data is unreliable.

Geographic Coverage

Canada is divided into four geographic regions and 10 provinces**:**

- The Atlantic Region which includes the provinces of Newfoundland and Labrador, Prince Edward Island, Nova Scotia and New Brunswick
- The Central Region which is made up of the provinces of Quebec and Ontario
- The Prairie Region which includes the western provinces of Manitoba, Saskatchewan and Alberta
- The Pacific Region which is composed of British Columbia.

Industry benchmark data are available for these provinces (except for Newfoundland) and regions. Newfoundland and Labrador data are aggregated with the Atlantic region.

Industry Coverage

Farms are also sorted into categories based on the types of products they sell. In order to be classified as a certain farm type, 50% or more of a farm's agricultural sales must come from the sale of one commodity or commodity group. Definitions are in accordance with the North American Industry Classification System (NAICS) used by Canada, the United States and Mexico.

There are ten farm types available for comparison in the tool: Grain and Oilseed; Fruit and Tree Nut; Potato; Vegetable and Melon; Greenhouse and Nursery; Cattle; Dairy; Poultry and Eggs; Sheep and Goats; and Hogs.

[1]Prior to 2001, the Farm Financial Survey was a biennial survey.

Gross Revenue Coverage

The farm revenue ranges are determined by the amount of revenue generated in an accounting period. The industry benchmark data are available for the following five (5) revenue classes:
- $10,000 to $49,999
- $50,000 to $99,999
- $100,000 to $249,999
- $250,000 to $499,999
- $500,000 and over,

and the following three (3) aggregated classes:
- $10,000 to $99,999
- $100,000 and over
- $10,000 and over (i.e., all farms).

Industry benchmark data are also available for Highly Specialized Farms. Highly Specialized farms are operations which obtain 90 percent or more of their revenue from one commodity or commodity group.

Ratio Coverage

Industry benchmark data are available for the following financial ratios:
Liquidity:
- Current ratio (current assets / current liabilities)
- Debt structure ratio (current liabilities / total liabilities)

Efficiency:
- Expense ratio (expense item / market revenue)
- Total operating expense ratio (total operating expenses / total operating revenue)
- Total operating expense ratio before interest (total operating expenses - interest / total operating revenue)

Debt Management:
- Debt to equity ratio (total liabilities / net worth)
- Net worth ratio (net worth / total assets)

Asset Management:
- Capital turnover ratio (total operating revenue / total assets)

Profitability :
- Return on assets (net operating income + net interest expenses) / total assets))
- Return on owner's equity (net cash operating income / net worth)

Example: Benchmarking

Below is an example of a poultry farm in Quebec with gross revenues of $300,000 in 2003. The farm's balance sheet shows that as of December 31st, 2003, the farm had current assets of $56,250 (the majority in short term investments), long term assets of $2,000,000, current liabilities of $45,000 and long term liabilities of $350,000 while generating a net operating income of $130,000 for 2003.

The farm was compared against an industry benchmark profile similar to itself: highly specialized poultry and egg farms (received 90% or more of its agricultural sales from the sale of "Poultry and Eggs"), in

Central Canada, generating revenues of $250,000 to $499,999. The producer can also use benchmark farms from other regions to compare his profile.

The results of the benchmark comparison reveal that the current ratio - the ratio often used to measure whether a business's ability to meet its debt obligations on time - is 1.25 ($56,250 / $45,000) is falling between the midpoint (1.74) and the cut-off for the lower 25% of farms (0.69). This indicates that this farm may be experiencing difficulties meeting its debt obligations on time, or in other words, it is having problems with liquidity.

Table 3: Results of the benchmark comparison: current ratio

		Industry Benchmarks		
Liquidity	Your Farm	Lower 25%	Midpoint	Top 25%
Current Ratio (current assets/ current liabilities)	1.25	0.69	1.74	4.23

For each ratio, the tool provides a short explanation of the result. The farmer may want to consider strategies to increase current assets, reduce current liabilities or both options. It should be noted that off-farm income has not been factored in and will improve the overall repayment ability.

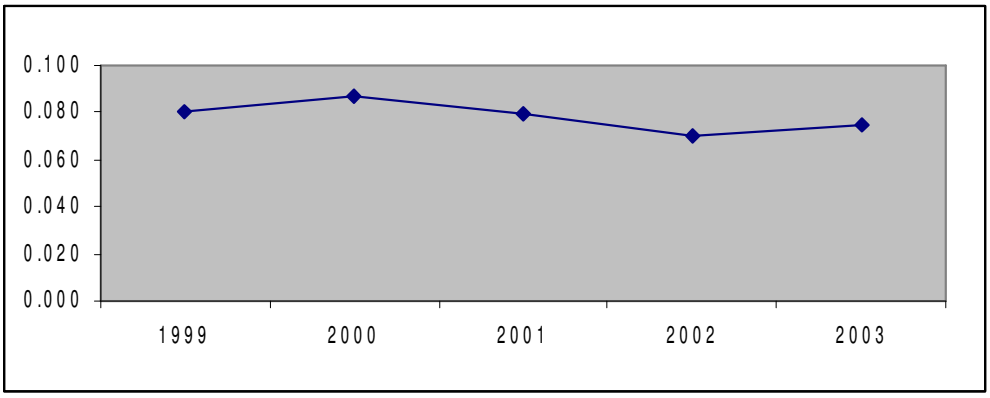
Example: Trend Analysis

Trend analysis compares a producer's business performance ratios over a period of time to show whether there has been an improvement or deterioration in the farm business's financial situation. The trends give clues as to whether the financial situation of the farm business is likely to improve and it helps to identify areas where performance has improved or deteriorated over time.

The example provided here is for a Prince Edward Island potato farm generating revenue of between $200,000 and $240,000 over the period 1999 to 2003. Suppose the owner made some changes to the farm operation in 2000 but was unsure whether the changes had much of an impact on the farm's overall profitability.

One ratio used to analyze profitability is the return on assets ratio. Plotting this ratio over time shows whether profitability has increased, decreased or remained unchanged; the higher the ratio, the more profitable the farm operation.

Table 4. Results of the Trend Analysis : Return on Assets Ratio
My Farm, 1999 to 2003



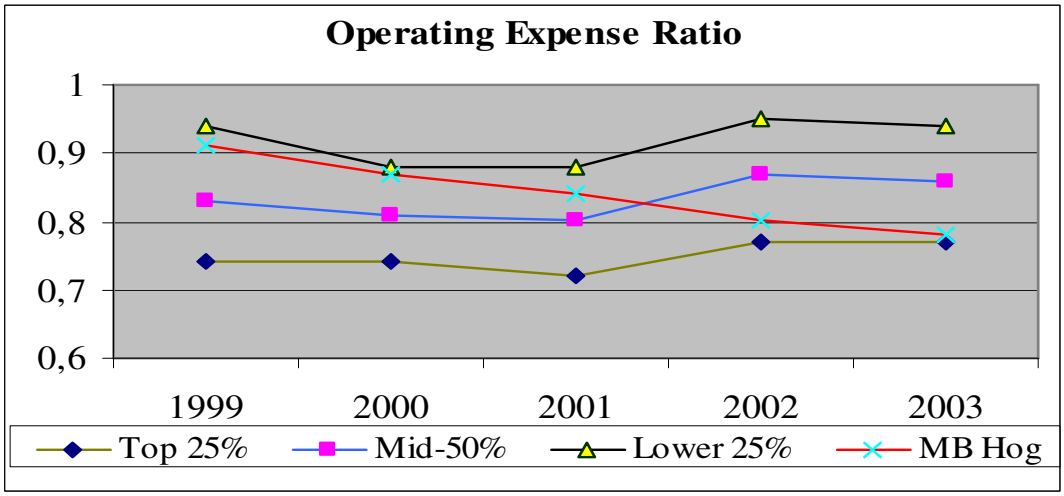
The results of the trend analysis reveal that return on assets has declined between 2000 and 2003. This indicates that the changes made to the operation in 2000 may have had a negative impact on profitability. The farm may want to look more closely at the changes made to the operation in 2000 to determine if the loss in profitability was due to those changes or if the decline in profitability was due to other factors such as a decline in market prices.

Example: Combining Benchmarking and Trend Analysis

Much can be learned when benchmark and trend analysis are combined. The example below is of a hog operation in Manitoba with gross farm revenues of approximately $300,000. The farm operation is highly specialized in the production of hogs, receiving over 90% of its agriculture revenue from the sale of hogs.

Suppose the owner would like to find out how well he or she is controlling costs. One ratio useful for analyzing costs is the expense ratio, which measures the ability of a business to control overall costs. This ratio is plotted over a number of years to determine whether the financial efficiency of this farm business has improved or deteriorated over time; the lower the ratio the more efficient the farm operation.

Table 5: Results of the Combined Benchmarking and Trend Analysis: Comparison of operating expense ratio of highly specialized hog farms in Canada, with revenues of $250,000 and $499,999, for the period 1999 to 2003



The results of the benchmark trend analysis show a downward trend line for this hog operation, indicating that the ability of the farm business to control costs has improved over this period. The comparison against the industry benchmarks for this farm type shows that the farm is doing fairly well at controlling costs and is now within the top 25% of farm operation, in that respect.

Tutorial

The benchmark for success 2006 tool also includes a tutorial that explains how to use the tool with step-by-step instructions. The tutorial explains the financial ratios, financial terms, financial statements and the various methods of calculating depreciation. In addition, the tutorial exposes the producers to three advanced financial analyses: break-even analysis, contribution margin analysis and cost of goods sold analysis. The first two approaches focus on the relationship between revenues and expenses. The cost of goods sold approach estimates the actual cost incurred in producing the product or service.

Uses and Limitations Of Benchmarking

Benchmarking is a useful starting point for analyzing the financial position of a farm. It can be used to tell whether the farm:

- is profitable
- is controlling expenses
- has enough money to pay its bills
- has a relatively large amount of debt
- is using its assets efficiently.

While it is important to understand and interpret financial statements, sound financial analysis involves more than calculating and interpreting numbers. As well, general cautions should be kept in mind when interpreting the value of a ratio:

- The context of the economy or the industry is important. For example, some of the variability in the values of farm ratios could be explained by a larger industry-wide trend. A drop in return on assets is usually undesirable. However, if the industry as a whole has experienced a reduction, then the drop for the farm's financial position must be considered in this context.
- The value of a ratio will depend upon the circumstances of the operation and the overall strategy of the farm. For example, a high current ratio may indicate a strong liquidity position, which is good or it may indicate the business has excessive cash on hand, which may be an inefficient use of resources. A value should be viewed within the context of the other ratio values.
- Using historical data independent of fundamental changes in a farm's situation or prospects would predict very little about future trends. For example, the historical ratios of a farm that has undergone a large change in its production or marketing would not likely tell very much about the future prospects for this farm.

Conclusion

Benchmark for Success 2006 provides farmers with an easy to use financial management tool. Its graphics and tutorial functions and other new features bring financial benchmarking techniques required for sound business management within the reach of all farmers in Canada. As such, Benchmark for Success 2006 represents a cost effective method for producers to make more informed decisions regarding management of their farms to help them remain competitive.

However, the financial benchmarking tool provided by Benchmark for Success 2006 is not a sufficient solution to all financial decision-making problems. The financial benchmarks against which the user compares his or her farm's financial performance are not magic numbers that all farm businesses should strive to achieve. Some very well managed operations will be above average while other good businesses will be below it. Deviations from the industry benchmarks should be a signal to explore the reasons for the differences. Future versions of Benchmarking for Success could include additional diagnostic tools, thereby further assisting Canadian farmers to make sound business management decisions.

AGRICULTURE AND AGRI-FOOD: CANADA'S RENEWAL PROGRAMS

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Abstract

Studies demonstrate that producers who develop business plans and skills are significantly more likely to be successful and maintain profitability in the face of changing market realities. However, finding ways to encourage greater use of farm business planning and management tools can be a challenge. Agriculture and Agri-food Canada (AAFC) has developed a set of Renewal programs to assist producers to access skills, knowledge, and advice in the field of farm business management. Since 2003/2004, two major types of programs are available to producers, the first type being the Canadian Farm Business Advisory Services (CFBAS) and the Planning and Assessment for Value-Added Enterprises (PAVE); and the other being the Canadian Agricultural Skills Service (CASS). Agriculture and Agri-Food Canada has used various models to deliver these programs. For instance, Renewal advisory services are provided by private business consultants and the federal Department of Agriculture and Agri-Food Canada has partnered with provincial governments, other federal departments and third parties to deliver the CASS program. This applied paper presents a policy background, a description of these programs, how they work using different delivery models, the feedback received from participants, and the lessons learned.

Key Words: *farm management, renewal programs, training.*

Background

Agriculture and Agri-Food Canada undertook a strategic policy review in 2001 for the development of a five year National Federal/Provincial/Territorial Agricultural Policy Framework (APF), from April 1, 2003 to March 31, 2008. Among other elements, the review highlighted the importance of management skills and practices for farming success in the new millennium.

> "Agriculture is becoming more knowledge-intensive, changing rapidly, and making farm management more complex. Skills and knowledge are becoming more critical for success" (AAFC, 2001).

To assist farmers access skills, knowledge, tools and advice in farm management, federal, provincial and territorial governments in Canada implemented a suite of Renewal initiatives starting on April 1, 2003, complementing existing programs.

The Renewal Programs

The three major national Renewal programs developed by Agriculture Agri-Food Canada (AAFC) are the Canadian Farm Business Advisory Services (CFBAS), the Planning and Assessment for Value-added Enterprises (PAVE) and the Canadian Agricultural Skills Service (CASS).

Canadian Farm Business Advisory Services (CFBAS

CFBAS provides financial assistance for producers to utilize the services of private farm financial consultants to assess their business and to develop plans to improve farm profitability.

CFBAS is open to all producers who have farm sales in excess of $10,000 annually and to beginning farmers who are defined as someone who has owned and operated a farm for less than 6 years or who intends to start a farm business in the near future. The program acts as an introduction to planning and change management. It is considered that if producers see value in this exercise, they would be encouraged to further adopt best management practices including the use of outside expertise, benchmarking, and financial performance review, along with strategic planning for the farm business.

CFBAS is made up of two components: the Farm Business Assessment (FBA) and the Specialized Business Planning Services (SBPS). There is another program that is delivered through the same channels which supports the development of value-added businesses by farmers, the Planning and Assessment for Value-added Enterprises (PAVE).

The FBA program provides access to a private third-party consultant for farmers to assess the past performance of the farm business and to develop plans of action to manage change towards improving profitability. This program allows for the equivalent of five days service of a consultant. The producer pays a nominal fee of $100, with the government covering the balance, $2,400. The main deliverables of this component are:

- a Farm Financial Assessment, including business profile, financial statements, ratio analysis, and assessment of profitability/viability of the operation;
- an Action Plan to assess the options for increasing farm profitability and to establish a plan to implement the preferred option, including a two-year cash flow projection of the option; and
- Follow-up services of one day, one year after the Action Plan to discuss progress and financial performance and/or modify the plan (valued at $500).

The second component of the Canadian Farm Business Advisory Services is the Specialized Business Planning Services (SBPS) which provides a financial reimbursement contribution of 50% of eligible costs (up to $8,000 per producer and $25,000 for groups of four or more) to hire a professional business planner for the development of farm business plans including general business plans, marketing, diversification, risk management, human resources, and succession plans.

Planning and Assessment for Value-added Enterprises (PAVE) focuses on the development of business plans to establish value-added activity of agricultural products. It includes a Feasibility Assessment of the economic feasibility and the viability of the value-added enterprise prior to a financial commitment by the producer, and the development of a business plan. PAVE allows for a contribution of up to $10,000 per producer based on eligible costs related to hiring business and financial planning expertise. Groups of producers are encouraged to apply to this component as it provides up to a $25,000 contribution for groups of three or more.

Canadian Agricultural Skills Service (CASS)

The Canadian Agricultural Skills Service (CASS) provides access to skills development and training focused at low-income farm families. This program includes a learning needs assessment and an Individual Learning Plan created with the assistance of a trained human resource professional. The government pays for this service valued at up to $2,000. The Individual Learning Plan maps out the producer's goals and the learning opportunities both for on-farm or off-farm activity aimed at improving farm profitability or increasing net family income. Because the government recognizes the contribution

that the spouse/partner makes to the overall farm family financial well-being and to the management and labour on the farm, the spouse (or common-law partner) of the farmer is eligible for the program.

An income test is applied for eligibility to this service. For a farm family, a total net average family income (farmer and spouse) of less than $35,000 for preceeding three years allows access up to $16,000 for each spouse; a net family income of $35,001 to $40,000 allows access to $12,000 for each spouse; and a net family income of $40,001 to $45,000 allows access to $8,000 for each. Beginning farmers are also eligible to have an assessment and Individual Learning Plan whether or not their combined income exceeds the net income thresholds, but they do not have access to training funds. Beginning farmers are also only required to provide income information for one year instead of three. Funding is provided for tuition costs, books and expenses such as dependant care, travel, etc.

Delivery Models and Program Uptake

Except for Quebec, the federal government delivers all three components of the Canadian Farm Business Advisory Services through five regional offices of Agriculture and Agri-food Canada across Canada. In Quebec, delivery is funded federally and provided by the provincial government through a provincial farm organization.

The FBA is provided by private farm consultants who are qualified through the government of Canada. These consultants are independent contractors who are pre-qualified through the standing offer contract process with the federal government, and the deliverables are pre-determined by the government to ensure quality of end product. Consultants have been screened on the basis of their knowledge and experience in agriculture and related business planning. Once qualified, they are trained in providing the financial analysis and a report that represents a consistent high quality end product that can be understood by the farmer.

Once the farmer applies for a Farm Business Assessment and chooses a qualified consultant from the rostered list of consultants, the regional office contracts for the services of the consultant. The consultant makes one farm visit where the financial information is provided by the farmer; and through discussions with respect to the current financial situation plans, scenarios are developed. The consultant then prepares the financial analysis. A further conversation is held with the farmer for the development of the options and forecasting of the financial expectations of each scenario. Finally, a written report is provided outlining the past and current financial performance and a forecast of the impact of the options to improve profitability. The consultant's contract is paid by the government on proof of deliverables.

A follow-up visit, usually one year after the initial contact, is provided free of charge to the farmer to assist in determining whether the expectations for change are realized or whether other changes are needed. This follow-up service provides a further contact with the farm advisor and in some cases materializes into an on-going business relationship.

The program was launched from July 2003 to March 2005, as agreements were signed with provinces. Since the program began, nearly six per cent of all eligible farms have had a farm business assessment through over eleven thousand contracts with consultants. For various reasons, such as pre-existing farm business plans, it was not expected that all farmers would participate in these programs. It was expected that the program would be used largely by producers of small and medium farms.
SBPS provides funding for farms that require more comprehensive business plans. The program allows farmers to choose their own experts and AAFC's Renewal Services provide guidelines on consultant qualifications and the pre-established deliverables for the plan. The producer provides a proposal for the type of plan, and together with a consultant develop the work plan, timetable and costs. SBPS reimburses a portion of the eligible costs, up to $8,000 for one producer, $16,000 for two, $24,000 for three and

$25,000 for four or more. To accomplish this, AAFC enters into a contribution agreement with the producer and reimburses the producer 50% of the cost of the plan up to the maximum amounts on proof of deliverables. It is the responsibility of the producer to ensure that the plan meets the deliverables pre-established by the government. This service recognizes that the producer should take control of his operational needs including contracting for certain professional planning services.

Nearly one-quarter of all plans in this program are succession plans, which reflects the importance to the participants of keeping the farm in the family. A survey undertaken by the Canadian Federation of Independent Business in 2005 also found that this was an important objective of the farm community (CFIB 2005).

Under PAVE, producers submit an application together with a proposal of a work plan for the consultant outlining the consultant's work, timetable and costs. Once approved by the Renewal office, a contribution agreement is entered into with the producer who in turn enters into a contract with a consultant for the work. Renewal staff verify the work is complete, and on submission of paid invoices, staff authorize payment to reimburse the producer for eligible costs. Producers are required to contract with specialists who provide the technical and economic feasibility assessments for value-added activities.

Close to 130 projects have been approved so far under PAVE with some examples of the projects undertaken being juice products from berries, wineries, ruminant slaughter facilities, grain seed cleaning facilities, on-farm anaerobic digesters, and bio-diesel additives production.
Considering FBA, SBPS and PAVE, producers on over 6.4% of farms with over $10,000 in sales have participated (Table 1). The participation rates have varied among the provinces.

Table 1: Canadian Farm Business Advisory Services (including PAVE) participation by province and by fiscal year

CFBAS	NL	PEI	NS	NB	QC	ON	MB	SK	AB	BC	Total
TotalFarms	**356**	**1,490**	**2,372**	**1,848**	**26,837**	**44,358**	**17,326**	**44,404**	**43,563**	**10,203**	**192,757**
Fiscal year											
2003-2004	27	62	41	24	170	46	70	402	330	29	1,201
2004-2005	29	57	78	42	178	279	144	587	356	104	1,854
2005-2006	9	76	76	58	1,681	350	193	779	351	92	3,665
2006-2007	13	78	106	39	2,120	873	377	1,161	526	143	5,436
Total	78	273	301	163	4,149	1,548	784	2,929	1,563	368	12,156
Percent of total [1]	21.9%	18.3%	12.7%	8.8%	15.5%	3.5%	4.5%	6.6%	3.6%	3.6%	6.3%

[1] Percentage of total eligible farms (number of farms with farm sales over $10,000).

The CASS program is delivered by different models in different provinces. The federal government provides guidelines for operations and funds are allocated through bilateral contribution agreements. Delivery agents are also provided with administrative fees to deliver the program.

In four provinces (Newfoundland and Labrador, Nova Scotia, New Brunswick, and British Columbia), a federal delivery model has been adopted through Service Canada by way of a Memorandum of Understanding between the federal departments of AAFC and the Human Resources and Skills Development Canada (HRSDC). Service Canada, which is part of HRSDC, has the responsibility of serving the client and contracting professionals for skills assessment and the development of Individual Learning Plans. AAFC's Renewal staff have the responsibility of authorizing funds for training through a contribution agreement with the client.

In five other provinces (Alberta, Saskatchewan, Manitoba, Ontario, Prince Edward Island), a provincial government - third party delivery model is used through contribution agreements with the provincial departments of agriculture to allow program delivery by the province and/or third parties. The provincial departments act as delivery agents and retain authorization for expenditures. In some cases, the province has the capacity to act also as a service provider, while in others, the province sub-contracts with other service providers to deliver the skills assessment and Individual Learning Plan component of the program. Service providers have to meet the standards set by the Canadian Counselling Association. Examples of service providers are community colleges and career development practitioners.

CASS has become a very popular program as it provides options for the farm family to increase their educational and skills background to increase their net family income either through improved farm income or off-farm employment. It provides many families with education, skills and training opportunities that they were previously unable to access as self-employed farmers under other government programs.

The success of this program is also largely based upon the commitment and approach of the provinces in advancing a skills training agenda for farmers. As shown in Table 2, in those provinces which are providing delivery, program uptake has been significantly higher demonstrating the influence delivery models have on program uptake.

Table 2: Canadian Agricultural Skills Service participation by province and by fiscal year

CASS	**NL**	**PEI**	**NS**	**NB**	**QC**	**ON**	**MB**	**SK**	**AB**	**BC**	**Total**
TotalIndividuals[1]	**167**	**1,184**	**1,822**	**1,267**		**29,249**	**14,476**	**35,779**	**29,575**	**5,652**	**119,171**
Fiscal year											
2003-2004											
2004-2005											
2005-2006	1	30	10	6		119	500	1,650	161	31	2,508
2006-2007	2	43	27	14		620	868	4,437	428	89	6,528
Total	3	73	37	20		739	1,368	6,087	589	120	9,036
Percent of total	1.8%	6.2%	2.0%	1.6%		2.5%	9.5%	17.0%	2.0%	2.1%	7.6%

[1] Eligible individuals are farmers and or spouses with net family income less than $45,000 on farms having gross farm sales over $10,000.

Nearly two-thirds of the program participants are established farmers and their spouses, with the other one-third divided evenly among the categories of beginning farmers, corporate farm members, and farm group member (partnership, co-operative, other association). As shown in Table 2, participation in the program has increased substantially since its implementation in February 2005, more than doubling in two years. About 60% of participants are choosing off-farm training opportunities while 40% are choosing on-farm ones.

AAFC Renewal Participant Feedback

Renewal monitors the delivery of its programs through client satisfaction surveys which are sent to all participants within 60 days of file closure. These surveys attempt to determine the client's satisfaction with key program activities, client services provided by the Renewal office including payment, satisfaction with the consultant, and value for money while it is fresh in the minds of the participant.

Consultants are surveyed separately as to the content and program design and ease of delivery of the product. In addition, consultants on standing offer meet with the Renewal regional staff annually to review the program and possible refinements, and have a chance to offer valuable feedback to the regional Renewal staff on a file-by-file basis.

Feedback from the farmers participating in programs provides valuable input and is used to re-design and refine the program deliverables.

These satisfaction surveys for the FBA found:
- 83% of the producers were satisfied with the program
- 78% believed the program provided them with what they wanted
- 82% felt the program was of value to them
- 86% say they received a high quality report
- 92% indicated their consultant understood their needs
- 57% felt that the program would lead to improved farm income and profitability
- 88% indicated that they would consider using a consultant in the future.

One participant stated:

> *"BSE hit us hard. We were running into trouble making ends meet, and we had to make some decisions about the direction the farm was going, and how we could manage the financing we needed (…) Through the FBA service, we went looking for a consultant who could give us the help we needed (…) It's helped the farm a lot, The refinancing plan was a big benefit, and so was knowing our break-even points so we could set our target prices. I'd highly recommend the FBA to any farmer, including farmers who are doing well—it never hurts to have someone look at your operation from a different perspective. The service was fast and efficient, and I was very impressed." (Fred Procinsky, cow-calf farmer, St. Michael, Alberta)*

With respect to satisfactions surveys for SBPS:
- 77% of the clientele have been satisfied with the service
- 85% indicated they received a high quality report
- 82% indicated their consultant met their expectations
- 87% indicated their consultant communicated effectively
- 80% indicated the program helped clarify their goals
- 77% indicated the program increased their understanding of factors critical to success to the operation
- 72% indicated the program helped to develop a more realistic and comprehensive plan
- 80% indicated the program increased their awareness of elements that need to be in a business plan
- 67% felt that the program would lead to improved farm income and profitability
- 90% indicated that they would consider using a consultant in the future.

For those clients who undertook succession planning, it has become an invaluable exercise and learning tool for the whole family, as the following testimonial illustrates:

> *"We realized we needed to develop a succession plan to hand the farm on to my son and his wife (…) We'll end up with what you might call a succession manual. It will include everybody's personal and business goals, and everything about how the farm operates. All the information is down on paper—contracts, finances, banking information, RRSPs and so on. At the moment, the highest priority for my wife and me is to know that the business we've built up will be taken care of by the next generation, and this plan will help see to that. I also believe that an early start on a succession plan helps the younger generation, while they're working the long hours that a farm demands, to see that there's really some benefit coming to them." (Doug Spencer, dairy farmer, Campbellford, ON)*

With respect to satisfaction surveys for PAVE:
- 91% of the clientele have been satisfied with the service
- 88% indicated that they would consider using a consultant in the future.

Most ***Canadian Agricultural Skills Service*** clients have not completed their Individual Learning activities, although they have completed their assessments and Individual Learning Plans, and the satisfaction surveys and feedback reflect these initial steps in the process. Considering this fact, CASS satisfaction survey found:

- 83 % have been satisfied with the program
- 83% considered the use of an ILP to be beneficial to a farm business
- 81% indicated that the program met their needs
- 66% indicated that the program increased their understanding of future skills requirements
- 63% indicated that the program helped clarify their learning goals
- 67% indicated that the program increased their awareness of the types and sources of learning activities available
- 71% indicated that the program will lead to increased farm profitability
- 84% indicated that the program will lead to increased family income
- 63% has decided to budget for training in the future
- 87% indicated that their interest in future learning activities increased as a result of this service

The following testimonial provides an example of the concrete benefits the program can have on participants:

> "What the family lacked, though, was a trained cheesemaker". In April 2006, with her CASS application approved, Ms. Hunter travelled to Ontario's University of Guelph, whose Food Technology Centre offers a one-week course in chessemaking. "I found it really excellent, and it gave me the knowledge and the skills I need to run our own cheesemaking business". The Hunters will have a small shop at the plant where they will sell their products. (Angela and Frazer Hunter, Dairy farm, Merigomish, NS)

Lessons Learned

Communications is a key element to ensure successful participation in programs. AAFC Renewal Services have relied heavily on federal-provincial-territorial communications mechanisms and products. As suggested earlier, it has been found that provinces, where an infrastructure has pre-existed that can

facilitate delivery and provide information at the grass roots level, have been able to obtain higher program uptake. For example, CFBAS program uptake has been higher in Quebec where it is provided by the farm organization, and the service provider is local.

Peer endorsement is an essential ingredient to transfer of information. This is seen in the way participants in the CASS program acquired awareness of that program. Groups closer to the producer such as producer organizations and commodity groups may represent good venues to disseminate information about management practices and related programs.

Third party program delivery through farm or other non-government organizations has both advantages and disadvantages. The use of third party delivery agents can increase industry buy-in and could be a more effective delivery system. However, third party delivery models also have the potential to be less efficient because of the additional monitoring required with the need to monitor standards and consistent program delivery among delivery agents. Some of the considerations that need to be taken into account when deciding who would be best to deliver a particular initiative include:

- capacity of the delivery agent (cash-flow, human resources, knowledge, commitment, infrastructure, etc.);
- cost-effectiveness of delivering an initiative;
- location and access to clients;
- consistency of the service delivered;
- jurisdictional mandates;
- service principles and government policies; and
- best practices.

Furthermore, communication could be supplemented and be oriented toward the link between programs and their impact on increased profitability and income. The impact of planning for profitability may be viewed as a longer time frame and its contribution less obvious. Although some research already exist, further efforts to evaluate the impacts of Renewal programs on profitability are required. Toward this end, AAFC is currently undertaking a Client Impact Assessment Survey that will measure specific program outcomes experienced by the Renewal program clients. Those results will determine what changes took place, what changes the clients felt were the consequences of the program, and the degree to which they were positive, and will describe the impact of these changes on producers' profitability, income and realization of goals.

Conclusion

The Agricultural Policy Framework is in its last fiscal year of operations as the agreement for funding for all programs terminates on March 31, 2008. At this time, stakeholder and public consultations are being held on the Next Generation of Agricultural Policy to build consensus as to the future direction of national Renewal programs building skills and knowledge with the sector.

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ENTERPRISING RURAL FAMILIES: HELPING FAMILIES MANAGE RURAL ENTERPRISES FOR SUCCESS

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Abstract

Enterprising Rural Families is a course designed to assist families manage their rural enterprises for success. It was conceived by Extension educators in the United States working with collaborators in Queensland Australia and British Columbia Canada. A robust model describes the interlinking and overlap of individual, family, business systems, and the community surrounding them. At the core is the rural family enterprise. Originally developed as an online course with supporting electronic monthly newsletter, the team has developed CD-based modules for distribution and presentation in other venues. Strategic Management focuses on assisting families define and achieve the success they desire. The Resource Inventory course is designed to aid in resource identification and assessment. Enterprising Rural Families provides hands-on solutions to issues faced by rural enterprise managers everywhere. As such, the course is especially relevant to areas intent on rural revitalization.

Keywords: *rural family, enterprise management, risk management*

Introduction

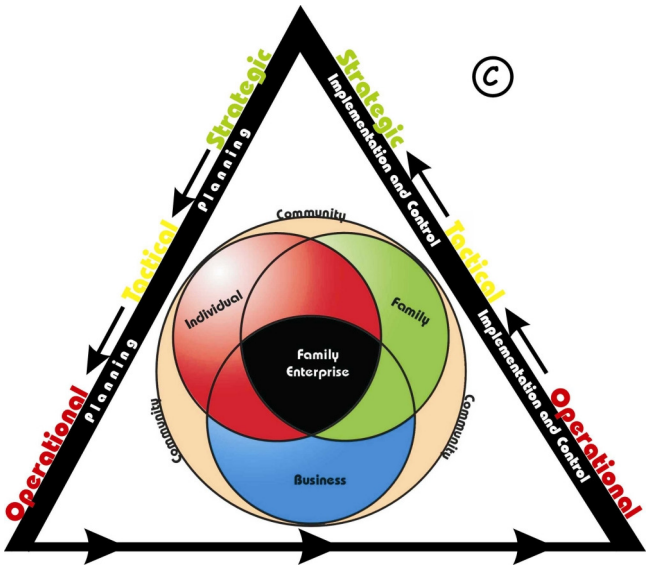
The course is developed around a graphic model which provides a representation of the components of the family-business enterprise system—the individual, family, business, and community. The family enterprise interface characterizes the process in which the independent systems overlap, forming a common boundary.

The ERF model represents an intertwining of systems. A system is an assemblage or combination of things or parts that form a complex or unitary whole. Typically, courses concentrate on the activities of the business system. The ERF course, however, focuses on the interactions of the family-business enterprise system.

The first system is the individual system. Each individual is a system of complex factors that makes up that person. The ways in which these factors mix contribute to the type of interaction the individual has with others in the family and business.

The second system is the family. This system is composed of two or more members, serving to nurture the individuals and provide harmony.

Figure 1: The Enterprising Rural Families Model



The third system is the business. The purpose of a business is to generate a return in excess of cost to further the goals of its ownership. The focus is on business management that includes the business's vision and mission, the position of the business within the industry, the management of resources, and the external and internal challenges facing the business, among other issues.

Finally, the community surrounds the three systems. The external environment surrounding the individual, family and business systems is yet another factor the family enterprise must contend and interact with.

The resulting family enterprise: an assemblage of an individual, family, and business system, along with the community, forms a complex, unique whole. The family enterprise interface represents the process in which the independent systems connect with each other to form the core: a focal point represented at the model's centre as the enterprise overlap.

The Enterprising Rural Families model introduces concepts that focus on the three systems and surrounding community comprising a family enterprise. It also introduces the planning process of a family enterprise represented by the triangle and arrows surrounding the enterprise. The planning process is an essential component of any successful family enterprise. As such, the ERF model emphasizes the progression of family enterprise planning from strategic goal setting to the tactical objectives to day-to-day operational plans. The process of planning, implementing, and controlling is ongoing, circular, and dynamic. As such, the model demonstrates that there is no starting or ending point in the process. The model also provides the planning framework for goal accomplishment.

Family businesses are a unique form of business, facing more risks than other business owners because the family and business are enmeshed; issues that threaten the business threaten the family as well. A family business can reduce risks and increase the likelihood of successfully integrating family and business by increasing knowledge about how to plan for the future. The family business is essential to the U.S. economy, yet family businesses have shorter life spans than businesses in general with few surviving into the third generation. The sustainability and longevity of the family business can be significantly increased with enhanced understanding and strong efforts to deal with these unique challenges and risks.

Strategic Planning and Goal Setting Course

Enterprising Rural Families began as an online course. Recently it has been updated to include two, CD-based modules for distribution and presentation in other venues. The first of these is *Strategic Planning and Goal Setting*.

Upon completion of the course, learners are able to:

- Identify the unique characteristics of a family-owned business.
- Describe the ERF model for family business systems.
- Identify the roles and responsibilities in a family owned business.
- Identify key points of change in personal and business cycles.
- Define goal setting and strategic planning.
- Identify the purpose and characteristics of a vision statement.
- Identify the purpose and characteristics of a mission statement.
- Identify the purpose and characteristics of a strategic goal.
- Describe the strategic planning process.

Family Business Dynamics

The whole of the family business is comprised of several independent, yet interdependent systems that have continual and dynamic interactions with one another – dynamics which are often not apparent in a typical non-family business. Decision-making in a family business is complicated, ranging from autocratic to group consensus, and sometimes not enough attention is paid to the concerns of the family and individuals. Family logic and dynamics can have considerable influence on business decisions.

Business-first or family-first – which is the emphasis? The goal of family is to create compassion and caring, while the goal of business is to incorporate efficiency and objectivity. The continuum of tension between these two systems often creates stress and misunderstanding amongst family members and between members of the business management team. There are critical differences between how families handle important issues as opposed to how businesses handle the same issues. The Family-Business overlap becomes a critical interface which must be dealt with through open communication and honesty for the family engaged in business to succeed. Assessments are provided for participants to better understand the attitudes and preferences of their family and business management team.

Characteristics of successful family businesses have been identified and should be goals for every family engaged in business together. As noted, the Enterprising Rural Families model sees family enterprises as an intertwining of the systems of the individual, the family, and the business, placed within a surrounding community. Individuals have personal goals, aspirations, and skills which may or may not fit well with the roles where they find themselves placed in the business. The family is a closed group and each has its own unique rules, norms, characteristics, and patterns. The purpose of the business system is to make a profit, fulfilling the goals and objectives it has

The overlap of each of these systems forms a unique dynamic which is different in each family business. In some, the family takes precedence, while in others it is the business. Sometimes the aptitudes and desires of the individual are important and sometimes individuals are virtually ignored at the expense of the family or business. Where all three of these systems overlap (individual, family, business) is where the actual family-business happens. This overlap may be healthy and open or fraught with tension and anger.

The community forms an additional environmental factor for the family business. The ERF model breaks this factor into two parts – the immediate community with which the individual, family, and business

must interact on a daily or frequent basis; and the external environment made up of industry, political, and environmental issues over which the family business will have less control.

The Planning Process

The Enterprising Rural Families model places the assemblage of individual, family, and business systems, and the surrounding communities within a strategic planning process. This process of planning, implementing, and controlling is ongoing, circular, and dynamic.

Matching roles to individuals is one of the first and most basic steps in preparing a workable plan for a family business. A role assessment worksheet assists with matching roles and skills within a family. Properly determining and assigning roles is a basic step in building a successful business management team.

Families and businesses go through distinct and separate cycles and these cycles may dovetail or clash to enhance or weaken the growth of either. Coping with the dynamic of change is a critical skill for all family businesses wishing to survive. Exercises are provided to help the participant think about the issues of change in their situation and how well they are prepared to deal with such change.

Strategic Planning

Planning starts with establishment of the management team and involves them in the process of communication and goal setting. Once assembled, the team must articulate a destination toward which they and the business will move – a statement of vision; a future that in important ways is better, more successful, and more desirable than the present. A vision is shaped by the beliefs and values of those involved and the ERF planning process encourages participants to identify those values which guide both the individuals and the family business.

A mission statement describes the family business as it fulfills its vision. The mission statement gives information on how the business functions and the landscape it operates in. It incorporates the purpose and aspirations of both the business and the family, defining what the operation wants to become, produce, and provide. As such, it is a concise description of the future the family business is working to achieve.

Strategic goals must be established, outlining long term outcomes which serve to fulfill the mission established. Good goals should be SMART: Specific, Measurable, Attainable, Related, and Time-based. Once SMART strategic goals have been established, resource costs for attaining each goal should be estimated and assigned – without costs, priorities and time-lines cannot be established, which is the next step. Determination must be made concerning which goals are immediately attainable and which must be worked toward, which should come first, how long it will take to achieve each, and what sacrifices must be made to accomplish each.

Tactical objectives and operational plans complete the strategic planning process and are covered toward the end of the course.

Course Tools

To accomplish the course objectives and deliver subject matter information, *Strategic Planning and Goal Setting* utilizes several tools:

- Scenarios of two example families in business to illustrate various aspects of the course content,
- Four worksheets and assessments,
- Seven readings to expand on course material, and
- Twenty-two interactive components and exercises to enhance participant learning.

Strategic Planning and Goal Setting is designed to help participants understand the uniqueness of the enterprise managed by a family in the world of business and a number of the risks and issues that such an operation faces. Family businesses are composed of distinctive, interactive systems that impact operation and success. Those that are successful share common characteristics which enhance strengths and compensate for weaknesses. One method to build on the strengths of the family business is to use proper visioning and planning processes. This allows members of the team to assume roles which most closely fit their skill sets. Such steps will build the sustainability and longevity of the family business from generation to generation.

Resource Inventory Course

A clear picture of the resources available must be developed before family business owners can fully appreciate the choices and options open to them. Conducting a resource inventory is part of the strategic level of management. It is the process where individuals involved take a hard look at what they have to draw from to make the enterprise a success. This process may lead to the discovery of new strengths or previously unknown weaknesses. The second CD-based module in Enterprising Rural Families is *Resource Inventory.*

Upon course completion, learners are able to:

- Identify the value and purpose of inventorying the resources of a family business.
- Describe the individual inventorying process and identify available individual assessment tools.
- Describe the family inventorying process and identify available family assessment tools.
- Describe the business inventorying process and identify available business assessment tools.
- Describe the community inventorying process and identify available community assessment tools.

Inventorying Systems

The three systems of the rural family enterprise—individual, family, and business—surrounded by the community are inventoried in the *Resource Inventory* course. How detailed an inventory depends on the importance of each system in relation to the family enterprise.

Individual System Inventory

Technical knowledge and skills are essential with the growing complexity of family businesses. But technical skills and knowledge may not be the core source of strategic competitive advantage. The skills needed to be successful in the future include vision and strategic management, communication, and personal management. These skills are more difficult to develop but family businesses that do so are expected to have an advantage in the changing world of competitive business.

Strategic management focuses on visualizing the future and where the family business fits. Assessing strategic management skills focuses on three major areas: visualizing the business future; analyzing the current situation; and assessing strengths as a manager.

Communication is often perceived as an art, and many individuals in family businesses believe they just don’t have the talent for it. By completing the communication skills inventory, the business owner has a

better understanding of their ability to convey information to those they work with and a preferred method for handling interpersonal conflicts.

Personal management skills determine how well an individual handles multiple roles and responsibilities of their lives. After completing the balance assessment, family business operators are able to rate satisfaction in the physical, mental, spiritual, career, family/social, and emotional dimensions of their personal lives.

Family System Inventory

Meshing a family and a business blur the lines which distinguish one system from the other. Family businesses are strongly influenced by the patterns of the family and it is impossible to understand a business without understanding the family running it.

Balancing work and family is an individual and family issue. If families are to be a positive influence, if individuals are to be successful and satisfied in their careers, they must assess what and how they are doing. After completing the balancing work and family assessment, families will better understand the current balance between work and family/personal issues and strategies to help manage the challenges working individuals face.

Every business and every family have roles that must be filled. Along with a clear understanding of the roles family and non-family members play in both the business and the family, every business needs clearly identified job responsibilities and people who can fulfill them. Where jobs and responsibilities are not defined, misunderstanding, friction, and poor performance can result. The Resource Inventory course includes a family role inventory that helps address these concerns.

Finally, good decision making leads to sound management. The means by which individuals make decisions is one of the keys to family business survival. Whether decisions in the family occur autocratically, through consensus, majority vote, or unanimously and the degree family members are involved in decision making is the focus of the decision making inventory.

Business System Inventory

Before determining a future direction for the business, a picture of what resources the business system has to work with is needed. The Resource Inventory course inventories the following business resources: industry and market; financial situation; physical and natural resources; human resources; business infrastructure; and intellectual property.

The business system inventories in the course assist family business owners explore:

- Current and future industry needs (industry and market),
- Overall financial strength and position of the business (financial resources),
- Cost and market value of natural and man-made resources (physical and natural resources),
- Key assignments needed to ensure success in the family business (human resources),
- Written and detailed procedures and policies (business infrastructure), and
- Copyrights, patents, or customer listings in the business (intellectual property).

Community Inventory

The family enterprise and the individual, family, and business systems are surrounded by the community. The resources used by communities and inventoried in the course can be placed into seven categories—natural, cultural, human, social, political, financial, and built. The family business interacts with these

categories to various degrees, perhaps even daily. Other community resources may be outside the control of the family business but nevertheless may exert an influence on the business.

Course Tools

To accomplish the course objectives and deliver subject matter information, this *Resource Inventory* course utilizes several tools:

- Twenty-two system inventories,
- Eight readings to embellish course material, and
- Thirteen interactive components and exercises to enhance participant learning.

The *Resource Inventory* course is designed to help the family business consider all the resources available to it. These resources are available from a variety of sources and systems. Some resources come easily to mind; others may take considerable thought to estimate their value to the business and the family enterprise.

Additional Components

In addition to presentation of the subject matter, each ERF CD-based module includes several additional components. These components are designed to assist the learner or presenter with course material. Additional information includes:

- Glossary- A glossary provides definitions and explanations of terms used throughout the course.
- Resources- The resources section provides links to additional online information and resources for family business managers, a listing of all module worksheets and readings, and a link to presenter files.
- Presenter files- This section provides the presenter with a teaching outline for making onsite presentations of the ERF module, access to Microsoft PowerPoint presentation files for all course content, and links to all course worksheets, readings, and activities.

The Enterprising Rural Families Team is grateful to the University of Wyoming Cooperative Extension Service and the United States Department of Agriculture Risk Management Agency (USDA-RMA) for supporting the development of ERF courses. Schedules for upcoming courses and more information about Enterprising Rural Families: Making it Work is available at www.eRuralFamilies.org. Requests for a free subscription to the ERF electronic newsletter or other inquiries may be emailed to Information@eRuralFamilies.org.

GLOBAL TRENDS AND CHALLENGES IN EXTENSION: A FARM MANAGEMENT RESPONSE

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Abstract

The paper reviews the dynamics of change in the global environment and its impact on the nature of farming in developing countries. Since farmers are working in a more competitive environment in order to increase income there is a need for their farm businesses to be profitable and adaptable to market conditions. Farmer's skills and capacity to better cope with this competitive environment need to be enhanced especially in the subject area of farm management. There is a need and challenge to broaden the technical scope of extension to better equip farmers to produce for the market. The paper discusses the response taken by FAO to meet these challenges. A strategy has been developed aimed at strengthening the capacity of extension workers and farmers by preparing and disseminating farm management training and extension materials adapted to the needs of specific countries.

Keywords: market orientation, farm management, extension, training.

Introduction

The dynamics of change in today's global environment have had a noticeable impact on the nature of farming. Farmers are working in a more competitive environment where in order to increase income their farm operations need to be profitable and adaptable to market conditions. The force of circumstances is placing an emphasis on the emergence of commercial agriculture. Moreover, with rapid population growth, urbanisation and economic development, the demand for food and raw materials has increased remarkably. Consequently, a much higher proportion of farmers have entered into the market offering farm products for sale. With the increase of market-orientation and commercial production, more complex and specialised services are required. These trends have had a direct effect on both the demand for skills improvement and competencies to promote market oriented farming.

Liberalisation and globalisation mean that farmers face greater opportunities to sell their products in the market. Farmers have to compete more rigorously with others and those that can manage their farms in a market-oriented way will be in the best position to take advantage of opportunities which could earn them more money. However, in doing so, farmers face competition as well as risks. Farmer's skills and capacity to better cope with this competitive environment need to be enhanced especially in subject area of farm management.

Farm management, however, has remained a neglected domain of agricultural extension services, particularly in the case of programmes addressing the large majority of family farms in developing countries. Extension has often limited itself to the transfer of technologies, on the presumption that lack of appropriate modern technology is what farmers in these countries need most. Whatever the rightness of this position in the past, times have changed; family farms have become more and more integrated into the market economy.

Structural adjustment has also been a dynamic that has also impacted on the composition of the farming sector resulting in public sector retrenchment of agricultural extension towards a greater involvement of civil society and the private sector. However, in many country contexts, particularly in rural areas where

poverty is widespread, the private sector has had difficulty in effectively replacing the public sector. Public sector extension services invariably continue to have an important role and one that needs to be supported and strengthened.

This paper attempts to look at some of the challenges facing agricultural extension and experiences with some of the responses initiated by FAO.

Challenges

Market Oriented Agricultural Advisory Services

The mandate of almost all national agricultural extension services remains the transfer of agricultural technology. As long as a new technology can raise yields it lies at the backbone of extension services. As a result of market liberalisation and globalisation pure production advice is becoming less important and the very definition, scope and technical focus of agricultural extension has been changing. Marketing and farm management have rapidly gained predominance over the last two decades. With the historically low food prices and increasingly urbanized populations, narrow production-oriented food security strategies for extension services are less relevant than in the past. Extension services are being expected to address an increasingly diverse range of client needs that reflect their diverse livelihoods. More emphasis needs to be laid on developing the capabilities and capacities of farmers in terms of problem solving, management and decision-making.

Extension Personnel Around the World in Need of Training

Worldwide, there are more than 600,000 extension workers comprised of administrative staff, subject-matter specialists (SMS), fieldworkers, and some multipurpose unidentified people. The ratio of SMS to field staff is low in Asia, Africa, the Near East, and Latin American countries, varying from about 1:11 to 1:14. These figures can be compared against a ratio for countries of Europe and North America (varying from 1:1.5 to 1:1.6) (Swanson et al., 1990). Deficiencies in knowledge, skills, and ability among extension personnel are remarkable. In the early 1990s surveys conducted showed that on about 39 per cent of the extension personnel worldwide had only a secondary-level and 33 per cent an intermediate-level education (Bahal et al., 1992). Within each developing region, there is a wide variation in basic academic qualifications of frontline extension workers, SMS, and administrators as are the differences in training received. The poor educational background of extension personnel necessitates regular training.

Demand-Orientation

The vintage practice of delivering common technical extension messages to all farmers using a single extension methodology is also being challenged and gradually replaced by client-focused approaches. Differential strategies are being promoted that deal with each category of client group individually with their different extension needs: subsistence farmers, commercial farmers, rural youth, women, rural poor, physically disabled and lately HIV/AIDS-affected farmers' families. This has given rise to terms like client-oriented extension, and gender-sensitive extension. Moreover, in certain countries of sub-Saharan Africa, the HIV/AIDS epidemic has changed the very composition of extension clientele, bringing young orphans, widows, physically weak, elderly and ill persons in the fields. The epidemic is not just a health problem but is a serious development issue challenging the validity of present agricultural extension approaches.

Structural and Functional Changes

There is also an increasing recognition of the need for national extension systems to broaden their mandates to extend beyond technology transfer and develop the human capabilities and capacities of men and women farmers. The organization, mandate, and practices of agricultural and rural extension systems are changing worldwide and it is vital that countries keep pace with latest developments. Extension services need to be more unified in the interest of optimum utilisation of resources and an efficient bureaucracy. Indeed, farmer's time cannot be wasted through multiple individual visits of extension workers.. The creation or strengthening of multi-disciplinary subject-mater specialist teams including extension workers trained in marketing and farm management extension during decentralisation of extension services in a number of countries, including Indonesia and the Philippines, is a popular move. The challenge of introducing appropriate institutional measures is being recognised by governments as is the need to reform the national agricultural extension systems to respond to global changes. Many governments have started to embark on processes of decentralisation and on ways to broaden the range of advisory services on offer to farmers, while at the same time ensuring that services are organised that can better respond to client demands. As noted previously, in many parts of the world pluralistic extension patterns are emerging. However, the roles and responsibilities of the public and private sectors have not been adequately defined. This also requires that appropriate organisational structures are established to promote active collaboration of stakeholders in both planning and implementation of extension programmes.

Information Technology Break-Through

Information technology is tremendously powerful and needs to be harnessed by extension organizations for the benefit of farmers. Agricultural extension services need to exploit this potential to strengthen their own capacities and to educate the rural populations who have access to media. Extension organisations in developing countries have traditionally faced two major problems in transferring technology and information. These are the physical distances in rural areas and the lack of transportation facilities. Information technology has the potential to erase these physical barriers by developing and applying appropriate interactive information mechanisms. The challenge is how the powers of information technology can be harnessed for the benefit of both extension agents and farmers without compromising the importance of human and unique local factors.

Negative Attitudes Amongst Extension Workers, Donors And Policy Makers on Market Orientation

The attitude of donors, government policy makers, public managers and farmers towards business advice and marketing is also an issue that has impeded change. These stakeholders still regard business in a suspicious way and as inherently exploitative. For smallholder farmers and especially those that are resource poor, market orientation is seen as a risky and disturbing concept for the public sector to accept. Development agencies are also often ready to directly finance extension services to support donor driven initiatives and this as a matter of strategy has been contradictory and proven to be financially unsustainable. The prospects for an emphasis on farm management advice in extension services require attitudinal changes amongst all parties in order for market driven approaches to take hold in a sustainable way.

Response

Regional Consultations and Studies

In the early 1990s a series of FAO sponsored Regional Expert Consultation Workshops were organised to provide insight into the provision of farm management extension services to farmers. This was

supported by country studies launched in Africa, Asia, Latin America and Central and Eastern European countries (CEE) regions. The specific aims of the studies were to: (i) review the current status of farm management extension; (ii) appraise farm management training materials; (iv) examine how farm management is covered in formal education programmes; (v) assess the needs and interests of farmers for farm management and more specifically for farm business advice; (v) appraise extension decision maker views on options for improving the provision farm management advice; and (vi) make recommendations for their improved provision.

In all regions the studies recognised that farm management is becoming increasingly important and the demand for management training and advice is high on the development agenda. However, they also noted the shortages of adequately trained extension personnel that limit the effectiveness of extension services and in particular the lack of skills in farm business management. This was seen to be true at all levels: farmers, field extension workers, farm management specialists, their supervisors and regional and national programme managers. Also within and amongst private and NGO extension service providers the capacity and skills in farm business management were also seen to be weak. The studies also pointed to a lack of a concerted strategy resulting in the design of ad hoc training and extension programmes in many countries (Berdegue 2005). For farm management extension to be effective capacity building was identified as critical.

The studies went on to highlight deficiencies in the design of training programmes and content of the training materials developed for extension workers and farmers. Training materials were sparse in their availability and of poor quality. The materials used in various training programmes tended to focus on farm management topics incorporated within Organisation of Economic Cooperation and Development (OECD) country farm management programmes. These were often found to be less relevant to the situation of smallholders in developing countries. Little effort was placed on adapting the farm management materials used to specific farming systems and in way that took into account the varying levels of literacy and numeracy found amongst potential clients. While testing farm management training materials in West Africa, the conclusion was drawn that many farmers preferred symbols to words and numbers (Kunze D. 2002). This suggested the need for generic reference materials for extension workers, but with guidance in adapting them to the different needs and conditions at regional and country levels. The studies recognised that an eclectic range of training and extension materials were needed for farmers, extension workers and senior management decision makers so that the promotion of farm commercialisation could be dealt with in a systemic way.

As a result of the Expert Consultations and the findings of the regional studies FAO proceeded on a programme of curriculum development to produce regional training programmes in farm business management for trainers of extension workers in the Caribbean, Africa, Asia, the Pacific, Latin America and CEE countries. Farm management training and extension programmes have been incorporated to date, in over fifteen FAO projects globally and a portfolio of training materials prepared to respond to extension workers needs, taking into account the global trends and regional differences.

Farm Management Training Programmes

Extension programme managers, extension workers and farmers are all targets of the farm management training and extension strategy. At the policy and programme management level, decision makers need to become aware of the increasingly important role of farm management in extension and programme design. At a lower tier the strategy calls for the preparation of training materials and design of programmes for trainers of extension workers in order to improve the capacity of the latter to work effectively with commercially oriented farmers. The third level is to develop information and training programmes for use by farmers and farmer groups through farmer to farmer learning.

More specifically the FAO training and advocacy strategy has been directed towards five levels of personnel:

- Training of farmers and farmer group facilitators
- Training of front line extension workers (public, private, NGO sectors)
- Training of trainers of front line extension workers
- Training of farm management and agribusiness subject matter specialists
- Awareness raising of policy makers and programme managers in the role of farm management extension and its practice and use.

The focus has been on the preparation of training materials to strengthen the capacities and skills of front line extension workers employed by ministries of agriculture, NGOs and the private sector working with farmers. Attention has been placed on training institutions and the trainers of extension workers as a way of ensuring sustainability. The training manuals aim at providing extension workers and through them farmers with an understanding of market oriented production as well as the skills and competencies needed to make profits and increase their incomes by farming for the market. They cover the principles of economics and the tools and techniques of farm management adapted to specific regional circumstances. The regional studies recognised that the emphasis on specific aspects of farm business management would need to vary depending on the location and duration of the training programmes. The FAO training materials and capacity building projects have also been evaluated and the training approach refined.

Recently FAO has also begun preparing training materials at farm level for use by farmer facilitators and farmer groups. The concept of the Farm Business School has been developed based on field level experiential learning throughout a farming year. The general format of the programme is a combination of self study guides providing technical information about given topics supported by field and class room exercises to reinforce the learning and practice skills.

Findings and Conclusions

The evaluations show that as a result of the FAO training efforts carried out through field projects and training programmes, the standard of proficiency of extension workers in many countries has improved. The farm business management curriculum is generally well received and perceived by extension workers as both relevant and useful. However, in some situations the effectiveness of the programmes has been weakened by poor training design and organisation. Moreover, some participants have complained about the lack of follow-up training which is needed as an integral part of the extension service programme. Decision making skills cannot be provided to farmers as a single one off activity in isolation from a more comprehensive and long term capacity building strategy with back-up services and follow up.

In view of the need for additional staff in many public sector extension services, with better capacity and skills, a challenge is to impart a basic knowledge to a large number of extension workers. This has been inadequate and in effect seldom happens. It is very rare that training programmes are seen as part of a broader strategy aimed at creating both a critical mass of extension workers at field level and farm management subject matter specialists. This is a vital prerequisite to ensure its institutionalisation and sustainability.

Government and donors are in the best position to provide back-up services to service providers which include public, cooperative and private extension workers, local authorities, academic institutions, researchers and value chain actors (input suppliers, processors, traders etc.). Such services could embrace training of trainer's programmes, mentoring, testing new value adding technologies, providing analytical assistance and developing training and extension service materials. An important area of back-up service

is the training of 'core trainers'; the first rung of Training of Trainers programmes. This assistance is needed not only to support farmers in farm business management but all actors located along value chains. These services need to be provided on a continuous basis to cope with changes and challenges encountered.

Another aspect is the need to better integrate farm management into the work programmes of front line extension workers. In the South Pacific, in particular, the focus on farm management training by itself was seen to be inadequate and extension workers felt that business management needed to be better integrated with technical aspects of farm management. This absence was regarded as an impediment to attempts to entrench farm management decision support services in regular extension activities (Mc.Gregor A. 2002).

Following is a list of lessons that have been learned from the review and field programme experience with respect to farm management training.

- Training programmes should be designed on the basis of client demand. However, since farmers are often unaware of their own training needs, an important aspect of a programme should involve stimulating demand for the 'programme' services. By demonstrating the returns to be made from the training, demand can be stimulated.
- The content of training programmes must be tailor made to the needs and requirements of the target recipients, their level of literacy and ability to assimilate the information provided.
- The content of training programmes should be kept flexible and broadened in line with trainee demands. New topics of business management might be introduced that include contract negotiations, food quality, and food safety, technology development and niche market penetration. In all events these subjects would also need to be selected in line with client demand.
- Training materials should be reinforced by the preparation of extension materials designed for specific categories of learners reinforced with other media such as radio and television and methods such as individual contact with extension workers.
- Training programmes should be designed for different stages of the farm enterprise development process. Farm business development is a process of change that requires the development of different management and entrepreneurial skills at various stages of enterprise growth.
- New ways of building local capacities need to be explored. Guiding individual farmers through processes of self analysis and problem identification with the objective of enabling the participants to solve their own problems. This is ultimately more empowering than the traditional ways of building local capacities.
- Training of both field workers and farmers should be practical, continuous, regular, participatory and closely monitored. Priority should be given to short, practical and action oriented courses, and theoretical topics should be linked to practical applications and demonstrations. Extension worker training in farm management should occur on a regular basis. Training should be concentrated and provided to field workers in manageable doses.
- A particular challenge for farm management extension is that of building capacities to undertake facilitation. Competent local facilitators are rarely available and especially within public sector agencies.
- Training should be largely 'experiential', practical and problem oriented, simulating the reality of the situation of the entrepreneur as farmer and service provider.
- Finally training should be cost effective, and aimed at maximizing outreach. This can be achieved by utilizing local training capacity, organizing farmers into extension groups reducing the transaction costs involved. Outreach can be assured by bringing training to the clients in the rural areas and at times of the day convenient to the trainees. This may be done by sub-contracting service providers located close to the clientele, in the rural areas, or alternatively by establishing mobile training programmes. This will help to minimise the opportunity costs associated with the training.

The changing nature of agricultural extension makes a case for pluralism in extension service delivery and systemic approach to deal with different actors involved in specific sub-sectors or value chains. While all extension workers at different levels within the public sector extension services need to strengthen their understanding on markets, prices, demand and policies (Rasheed and van den Ban, 2000), there are other stakeholders situated in the value chain that also need to be reached. Training needs to be broadened to ensure that the capacities of other players in the chain are also developed. The role of the extension worker is wider and deeper.

Furthermore, farm management extension and training cannot be seen in isolation from formal training programmes conducted by universities, schools and colleges. Farm management is part of the curricula of the leading agricultural universities in most developing countries. Yet, the level of formal education in developing countries is often weak. The development of training programmes at university, vocational college and secondary school levels is vital to ensure the longer term development and sustainability of the discipline. By following the systemic approach there is a need to produce training and extension materials that are demand responsive, adapted to the needs of different stakeholders, in different development contexts.

'Good' institutional practices and mechanisms are also required to improve the public sector extension performance. This will require the design of a monitoring and evaluation system focusing on the capacity building of extension workers, farmers and other actors within the system, as an ultimate measure of outcome. As the implementation of farm management extension programmes is based on complex processes at different levels, involving large numbers of stakeholders, structures and mechanisms need to be developed in which the performance of the entire process of learning, adapting, reflecting is regularly reviewed and the activities, roles, and relationships of different actors and their overall effectiveness are evaluated. Stakeholders will need to assess together the performance of the actors in the change process. Platforms and processes to facilitate access to experiences are needed so as to create an open and transparent atmosphere of exchange and a shared joint vision for supporting farm commercialisation. These issues reflect the challenges for the future.

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RESTRAINING THE URGE TO ENLIGHTEN STUDENTS IN ORDER TO CHALLENGE THEM TO DISCOVER AND LEARN

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Abstract

This paper looks at the link between what educators understand about learning and the putting of that knowledge into practice when designing learning experiences for their students. The focus of the paper is the structuring and execution of a farm tour for farm management students to achieve higher order learning outcomes. The design involves focussing student attention by embedding the student assessment process entirely within the tour itinerary. More provocatively, it involves teaching staff and farmer cooperators initially restricting their responses to aspects of student questioning in order to help rouse students to sharpen their observational abilities and skilfully share and draw on their own collective prior learning and knowledge.

Keywords: Farm management education, student tours, constructivism

Introduction

There is no shortage of advice in the educational literature regarding the preferred roles for students and their instructors in the teaching and learning process. Much favours the constructivist approach which purports that students learn best through a process of personal discovery. With this process students are confronted with complex situations and challenged to learn what is needed to resolve them. The role of the teacher is to provide the learning environment and support to assist the students to learn under these circumstances at a deep level.

At the same time, a feature of farm management education in Australia has been the practice of taking students onto commercial properties to learn about their management. Generally this has proven to be informative, enjoyable and successful. But have these occasions been planned from an educational perspective to achieve a level of learning by students of the highest order? This paper will review some educational underpinnings then discuss one case where an understanding of learning processes has been applied for students participating in farm tours in an attempt to reach a level of learning not normally achieved.

Views about learning

When we take students onto farms to learn about management then it is helpful if we understand how it is that students learn. While students have their individual styles and differences, if instructors have an understanding of the learning process they are more likely to be able to structure the farm visit to best educational advantage.

Many theories of learning exist and coexist. Cranton (1992) credits Dewey with promoting interest in the area of adult learning, the place of interest for those engaged with tertiary students. While Dewey does not write about adult learning specifically many of his ideas of learning are based on the notion that *experience* is a critical component. Behavioural psychologists such as Skinner, Thorndike and Watson used experience through a stimulus recall approach to describe an approach to learning. Gagné (1975, 1977) builds on these ideas and with others (Gagné, Briggs & Wager 1988) describes an approach to teaching based on behaviourist learning theory. Interest in behaviourist approaches however has waned and Vygotsky (1962), among others, criticised behaviourism as failing to consider the person and having a narrow view of learning that fails to take into account the sociological context in which the learning takes place.

A different view of learning is addressed by those often labelled as humanists. Where behaviourists essentially focus on content, humanists focus on people. Rogers (1969) describes learning in terms of self actualisation and Maslow (1968) presents a hierarchy of needs that learners work through in order to achieve this self actualisation. Knowles (1980, 1990) in his theory of andragogy takes essentially a humanist view - a theory that picks up on other views as well. This focus on the learner has resulted in the identification of learning styles typified by the work done by Kolb (1976). Developmental psychologists and critical theorists are among many others who have been principal contributors to further building our understanding of the learning process.

It has however been the constructivists who have emerged from these earlier debates on the nature of learning with widespread acceptance. Constructivism represents a radical departure in thought about the nature of knowing, hence of learning, thus of teaching. Some have suggested shortfalls (for example Phillips 1995 and Fox 2001) but constructivism has attracted general support as it holds that knowledge is not mechanically acquired through information processing but is actively constructed within the constraints and offerings of the learning environment (Liu & Matthews 2005). It perceives learning as a change in meaning constructed from experience. Constructivists view learning as being something very personal. Von Glaserfeld (1984) explained that learners do not simply mirror and reflect what they are told or what they read, they look for meaning. Much of today's thinking about this has developed from the work of Bruner (1966) who points to learners constructing new ideas or concepts based upon their current/past knowledge. The learner selects and transforms information, constructs hypotheses, and makes decisions allowing the provision of meaning and organisation to experiences and allows the individual to, as Bruner (1973) explains, go beyond the information given.

Central to the tenet of constructivism is that the construction of knowledge by individuals needs to be an *active process*. While information may be imposed on students, understanding and therefore knowledge cannot be imposed as it must come from within. This is a critical point – knowledge is not directly transmittable from person to person. Constructivism requires a lecturer/teacher to act as a facilitator with a primary function of helping students become active participants in their learning and to make meaningful connections between prior knowledge, new knowledge, and the processes involved in learning. This is not always applied in practice by those planning student learning experiences such as farm tours where the student is often *told* information by either the farmer cooperators or the lecturer/teacher and somehow this is expected to translate into learning. Those taking a constructivist approach will structure the tour somewhat differently by devising learning experiences and providing mentoring and guidance in a way whereby their students will *discover* knowledge and develop skills which lead to the achievement of worthwhile learning outcomes.

Implications for Teachers

The foregoing discussion about learning processes suggests that as far as instruction is concerned, there is general acceptance among educators that the instructor should encourage students to discover knowledge

for themselves. This contradicts the approach frequently taken with conventional student tours where they often reduced to merely information gathering exercises where the answers are provided by the farm staff or the teachers.

Bruner (1973) has given the guidance that the task of the instructor is to translate information to be learned into a format appropriate to the learner's current state of understanding with curriculum organised in a spiral manner so that the student continually builds upon what they have already learned. While there are differing perspectives, most educators appear to agree that learning involves a synthesis of cognitive and social perspectives (Windschitl 2002). For the most part learning occurs in an *interactive* social environment and is considered to be largely a situation-specific and *context bound* activity (McInerney & McInerney 2002, Woolfolk 2001). So while meaning making is regarded as something to be personally constructed, it is most effectively achieved when there is social mediation.

Given the above, potential barriers to student learning on a farm tour are a lack of appreciation of the importance of context and an absence of opportunity for social mediation. If students do not sufficiently appreciate the importance of making management decisions according to context then they could well default to a narrow right/wrong, one-size-fits-all viewpoint. There is some research described next which gives this credence.

It has been argued that students themselves need to shift from a credo that knowledge is certain and comes from some external authority, such as the cooperating farm manager or their teacher (Morgan 2006). Individuals have to define their own beliefs, identity and relationship with the world – attaining this is termed self-authorship (Baxter Magolda & King 2004). Self-authorship means actively understanding the basis and the limitations of our own knowledge and accepting that knowledge is relative and personal. Pizzolato (2003) points out that many entering university students see the world in binaries of right or wrong, good or bad, and anticipate being given single right answers. There is a progressive transition away from expecting sets of single right answers to be accepted uncritically and towards realising that determining what is right requires analysis of relevant evidence according to the context (Belenky et al. 1997, Chickering & Reisser 1993, King & Kitchener 1994).

Research by Baxter Magolda (1992) clearly showed this process of transition unfortunately provides no guarantee that most students develop contextual ways of knowing by the time of their graduation. When she followed her students beyond their graduation and into the workforce, Baxter Magolda (2001) found a sharp rise in their ability to consider context when interpreting situations. However, she also found that they lacked self-authorship; that is, they did not construct their knowledge through interactions driven by their own perspectives and goals balanced with their understanding of the contextual nature of knowledge. She concluded *that universities failed to trigger the necessary development of self-authorship by* ***too readily supplying students with information and answers***. Students were not being confronted with sufficiently provocative experiences that disrupted their equilibrium in such a way that they would develop complex, reflective ways of knowing.

Morgan (2006) feels this beckons university educators to devise approaches that will assist the development of self-authorship in students. He suggests employing processes that provoke students to engage with others in critical thinking and knowledge applications. It bids us to immerse our students in challenging experiences from which they can make meaning. He asserts that as academics our role is not necessarily to provide answers but instead to pose questions that guide our students as they explore ideas and test and refresh their current knowledge through new contexts and experiences. Student excursions are opportunities for employing such active learning designs and the remainder of this paper will report on a case situation where such a learning design was used.

A Constructivist Farm Tour Design

Morgan and Cox (2006) have detailed a farm tour structure used at an Australian campus that appears to align well with the learning considerations outlined above. Their final year Farm Management degree students undertake a three day tour looking at beef cattle properties. Earlier these students will have had a preparatory series of lectures and practical classes and they will previously have successfully completed other studies in the livestock field providing them with a relevant knowledge base. Many also will have gained a familiarity with livestock systems through their own farm experiences [this fits with Bruner's principle for the spiral organisation of curriculum where students build upon their earlier knowledge base].

Students visit three properties and while there they work in groups do devise management plans for each property's beef cattle enterprises. These are significant challenges [this fits Baxter Magolda's maxim to disrupt the equilibrium of students] and group members have to be incisive with their observations and interrogations and utilise the knowledge and abilities of each member to the group's best advantage [this fits with the social mediation aspect of knowledge construction by facilitating an interactive social environment]. This is an approach also advocated by Pizzolato (2003) whose research highlighted the importance of interactions with others in managing provocative experiences and building self-authorship, as it is others who guide the establishment of procedural, conceptual and relational schemas associated with their personal goal or task achievement.

The benefits to students from successfully working in groups is widely acknowledged (for example Jacques 1984 and Michaelson 1992) and it is not surprising that capabilities arising from this such as interpersonal and teamwork skills commonly appear on university graduate attribute lists and are highly valued by employers seeking graduates (Harvey & Green 1994). Incorporating group activity within this tour design provides both staff and student benefit. For teaching staff, the activity would be logistically more difficult, if not impossible, if individual rather than group plans were to be presented while on the tour and also an unreasonable imposition on cooperating farm staff to participate in the far more extended assessment process that would result. For students, by working in groups they have the enhanced opportunity of learning from and with each other. Through utilising the strengths within their group the students will likely collectively analyse and evaluate the situations they encounter in a more comprehensive and refined manner than they would as individuals, a laudable management capability.

Not all students will of their own accord devote themselves to achieving group tasks. It is widely recognised (for example Isaacs 2002) that assessment can be a driving force motivating students to participate in a committed manner in group tasks. This tour design incorporates the assigned tour tasks into the subject's assessment with peer assessment by the students included in the task alongside the evaluation conducted by tour staff and cooperating property managers [this fits Bruner's guidance to heighten the students' predisposition for learning]. The tour design involves an evaluation of both individual and group performance and the combination of tutor and peer assessment, and possibly utilising independent judges as is the case on this tour design, is commonly advocated in the literature concerned with the assessment of group tasks (see, for example, Isaacs 2002 and Spronken-Smith 2003).

On this tour the students are allocated by staff into groups of six with a three part requirement. Each group is to propose

- a livestock management calendar for the property,
- product specifications for the livestock enterprises on the property, and
- a marketing strategy for the livestock products.

The groups who do this well tend to be those where they quickly discern and manage the expertise and attributes of their team members to best advantage, a foundation of good management generally. Understandably students approach the task in part by utilising their current knowledge base formed from

preparatory class work, learning gained in earlier livestock subjects studied and from their previous farm experiences. The major contributor to completing these tasks to a high standard, however, needs to be through their understanding of the context of that farm – the precision of their observations about the property being examined and its livestock plus knowledge specific to the property they glean from farm staff.

The logistics of the exercise are described by Morgan and Cox (2006) in some detail but basically a full day is spent at each property with each visit commencing with preliminary discussions involving the farm manager and other farm staff with the full tour party. An overview of the farm business and broad details of the current livestock enterprises are provided. However, where this differs from a more conventional tour design is that it is stressed to these presenters to refrain from giving any details directly related to the three particular contextual tasks that the students have to complete [this fits with Baxter Magnolia's views on self-authorship discussed earlier where universities were criticised for too readily supplying students with information]. Similarly, while students have the opportunity to ask questions to help them clarify the business environment, there is a constraint on their questioning as they are instructed not to seek details of the current management calendar, product specifications or marketing strategies being used – the areas where they are to propose plans.

Following the briefing the tour party look over the property and view its livestock. Typically the stock are in several groups located on different parts of the property either grazing, in a feedlot or in the cattle yards. While students do have the opportunity to quiz the farm staff within the set parameters, again the hosts are under instruction not to volunteer any information on the livestock being viewed. Instead, while the students are looking at the livestock the lecturer in charge challenges their observational and deductive skills by putting some questions to them which serve to provide a platform for them to go about their assessable tasks. The teaching and farm staff restrain themselves at this time from making any comment as to the accuracy or otherwise of the responses students make to such questions as the students are expected to reach agreement within their groups on these matters [this fits the guidance from Brooks and Brooks (1993) to encourage student enquiry by asking thoughtful, open-ended questions and encouraging students to ask questions of each other. It is also supports the approach advocated by Schön (1991) who encouraged educators to replicate conditions that reflect realities professional practitioners face trying to contend with unique problems as they "think on their feet" using a collection of theories, processes and experiences].

After this property inspection, the students work in their well-separated groups on their assigned tasks with their teachers and the cooperating farm staff acting as itinerant facilitators. The first group ready to do so orally presents their findings to an audience of the teaching staff on the tour, the farm manager and other cooperating farm staff. Meanwhile the other groups remain apart and continue with their preparations until the assessors are ready to hear them. The students are expected to share duties fairly among themselves and generally divide the presentation into different segments, assigning each member a particular responsibility. Once each student completes his or her contribution the other group members provide supplementary commentary. During the presentation, each student is asked by the audience at least two individual questions with others in the group invited to add to the reply of the individual respondent. This process is repeated for each of the two subsequent properties visited with group membership changed each time.

The cooperating farm staff and the teachers respond to the students once they have completed their presentations. They discuss the merits or otherwise of the observations, thoughts and suggestions that were raised. It is at this time that they reveal the actual farm management approaches and explain the constraints and rationale behind these approaches [this fits with the need to emphasise the contextual relevance of the decision making].

It is at this point that the evaluations occur of both the overall group performance and that of each group member [this fits the widely held view that it is important to assess student understandings through task application and performance (Brooks & Brooks 1993)]. All parties are involved in doing the assessing – the teachers, the farm manager/staff, and the students doing peer assessment. Earl (1986) notes that giving students such a responsibility mirrors aspects of the professional environment and tour staff felt this contributes to their development as managers. Again the details are discussed by Morgan and Cox (2006) but there are weighting differentials with all parties making judgements against pre-determined marking criteria with the first visit used as a non-assessable 'trial run'. The students individually are told their mark before visiting the next property and going through the process once again. The assessment design largely follows the guidance and format explained in detail by Healy and Addis (2004) who refined their approach from one presented by Conway et al. (1993). It is a design that makes it necessary to be an active participant in the group processes if an individual student wishes to score well. Unlike some other forms of assessment (Alam 2004, Marsden, Carroll & Neill 2005), it would be difficult for a student with a low learning orientation to score well through heavy reliance on others. This design also is one where it is in every student's interest for their particular group to score well overall and it overcomes a criticism of category-based peer-assessment made by Lejk and Wyvill (2001) when individual marks are calculated on a 'zero-sum' basis leading to competition within the group.

Conclusions

The farm tour approach described here fits well with principles advocated in the educational literature:

- it involves engaging students actively in their learning (e.g. Brockbank & McGill 2003, Marquardt 2004),
- it has a strong process orientation involving the nurturing and improvement of student communication, observation and enquiry skills (e.g. Athman & Monroe 2002),
- it gives students leadership opportunities and the challenges of managing group situations and taking responsibility for others (Gold et al. 1991, Watson et al. 1998),
- it involves intense group discussions intended to lead to a greater depth of understanding of the issues and independence as students need to learn from each other and not be cognitively dependent on their lecturer (Kremer & McGuiness 1998),
- it demands students utilise effective communication and teamwork skills to generate logical, creative ideas and exhibit a capacity to apply their learning (Duch, Allen & White 1998, Kremer & McGuiness 1998, McIlveen, Greenan & Humphreys 1997), and
- it requires students to pursue, collect, analyse, synthesise and evaluate information, a process consistent with the building of the above higher order skills (Powis 1999, McKinney 1998).

Excursions to farms can be occasions where students look and listen and not necessarily enquire and analyse. Students invariably return from farm tours reporting that they have learned a great deal, but what is it have they learned? How well have they constructed meaning from the authentic context they have experienced?

The design of the farm tour reported in this paper effectively demands a high level of participation from all the students. As Mossa (1995) found, motivating students to participate actively in field excursions leads to outcomes such as the acquisition of self-esteem, something we associate with self-authorship. This tour design, which includes providing feedback while they are on the tour, has been effective in provoking students to contribute conscientiously to their group output. Perhaps more importantly, its focus on demanding students to be self-reliant and link their observations with their prior learning, to probe each other and industry cooperators purposefully, and to work productively under pressure with their colleagues to analyse the situation and solve problems all intertwine holistically to build self-authorship. From a constructivist's perspective, the design fulfils the primary responsibility of teachers to create and maintain a collaborative problem solving environment, where students are allowed to construct their own knowledge with their teacher acting as facilitator and guide.

In summary, there is considerable potential for many student excursions to farms to better achieve valuable educational outcomes through teachers rethinking and reframing their approach and structuring student participation around constructivist learning principles. For farm management educators, there needs to be a connection between how they design their student tours and what is understood about the learning process. That linkage is not always apparent.

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COW-ALITION, FROM SOLO TO STRATEGIC ALLIANCE NETWORKS HAVE MORE INNOVATIVE POTENTIAL THAN INDIVIDUALS

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Abstract

In the Netherlands a network program is active. Groups of farmers are stimulated to work together with researchers to achieve certain goals. I will address in my contribution questions, like what is a network, how does a network emerge and how can a successful network be pointed out? As case I will discuss the network I am involved in. This is called "Cow-alition", because we work together with other farmers to try to realise a "rich life" by combining labour, buildings, land and machines to operate efficiently and spread the risks. Such a coalition needs knowledge and tools in technical, economical and management fields, but most of all social skills. Questions that will be addressed are how to measure if persons can work together, how to manage such a type of coalition and what are the threats and opportunities?

Keywords: network, cooperation, social skills, economics

Network Program

The animal husbandry sector in The Netherlands is looking for new perspectives for a sustainable future. The capacity to create such new perspectives depends largely on farmers who know where to find supportive ideas, supportive knowledge workers and supportive actors in the production chain, amongst consumers and in government, in order to make changes possible. Assumingly networks are playing a crucial role in this regard. In 2004 an experiment has started to support networks of farmers by providing subject matter specialists (mostly researchers) as facilitators assisting them in realising their ideas. The Ministry of Agriculture, Nature Management and Food Quality is funding this experiment, as part of its search for a new role in stimulating innovations. The experiment will continue until the end of 2007.

Assumptions

The experiment assumes that networks have more innovative potential than individuals. Providing networks with facilitation for the co-creation of knowledge is believed to be a powerful approach for creating a climate that is conducive for sustainable innovations. A second assumption is that farmers ideas form a good starting point and that their enthusiasm is a critical factor for success. This assumption redefines the role of the researcher from a knowledge producer to a facilitator in knowledge co-creation. A third assumption is that subject matter specialists can do the job, provided that they will be given a backpack with facilitation tools and skills. Their knowledge of the subject matter is believed to be crucial for their relationship with the farmers. On a personal level, however, the role of facilitator does not fit every researcher. Personality, good communication skills, motivation and enthusiasm are probably even more important than subject matter knowledge to play the facilitator role successfully.

In a network the experience and creativity of all members can be shared for more appropriate outcomes. The threshold for implementing changes at the enterprise can become lower because of the social interaction within the network. Important as well is the impact on other stakeholders that should move along when innovations are to be implemented. The experiment shows that a network of farmers can

make things move, as they have become a negotiation partner for policy makers, stakeholders in the production chain or organisations for nature conservation or animal welfare.

Free Actor

Regarding the process, the full potential of a network only emerges if there is at least one free actor who can take the network at a higher level of coherence. A free actor is someone who has the vision, the position and the energy to do what is necessary for the network at a certain stage. Providing such a free actor on a temporary basis can enable the network to rearrange itself and take a next step in its development. In the experiment this role is played by the facilitators. However, this is not an exclusive role to be played by externally appointed facilitators. Everybody with the necessary qualifications can be the free actor in a network, even one of the network members.

Definition and Selection

For the experiment networks are defined as: a group of at least three farmers plus others with a common objective to achieve and (if not common, at least) a common desire to learn.
The experiment uses a tender procedure to select the networks. Over the last three years in total about 100 networks are supported by the Network Program.
Energy is a primary criterion for the selection of networks that participate in the experiment. Applicants should show initiative and enthusiasm for the subject they propose to be investigated with assistance from research. If approved, a facilitator is added to the network who is knowledgeable about the subject and can share the enthusiasm of the network members.

Facilitators and Tools

Through these facilitators farmers easily get access to experts who appear to be important for their search and learn process at the time this is appropriate. Furthermore, skills and personality of the facilitator should be taken into account for choosing the most appropriate intervention. The tools provided for this purpose have in common that innovation is being regarded as an autonomous processes that occurs in a conducive biotope. The tools applied in the experiment help to:

- Recognise different situations in knowledge networks and processes;
- Identify limiting and enabling factors in these situations;
- Choose an appropriate interventions in order to create space for flow;
- Analyse the commitment and position of participants in a Network Analysis.

Explaining the tools in full detail would go beyond the scope of this paper.

More information on this subject is presented in the paper entitled: *Facilitating sustainable innovations by networking; Experiences with 100 networks in animal husbandry in the Netherlands* by Eelke Wielinga, Francisca Hubeek, Klaas Jan van Calker, Wim Zaalmink, Maarten Vrolijk.

Cow-alition Network

The Cow-alition[1] Network consists of six families owning five dairy farms in Friesland (North part of the Netherlands). Within the framework of the Network Program the Cow-alition Network started in 2006 and is still running. The actual birth however, took place in April 2005 after a long period of breeding on the idea.

[1] The official network name is 'Ko-alition' in which 'Ko' in the Frisian language means cow.

Conception

Over the last decades I saw several trends in dairy farming in the Netherlands (1) the increase of farm size and thereby the increase of costs for capital investments (i.e. in land and milk quota), (2) the increase of labour costs and (3) the decrease of milk prices. As a starting entrepreneur in dairy husbandry these trends did not paint a positive picture to me and my young family. And beside that, I also wanted to keep the opportunity to spend quality time with them, and they with me of course. So in order to remain a dairy farmer with a sustainable farm income and at the same time to be able to have a good family and a social life, something had to change. This was the moment I conceived the idea of creating a strategic alliance with other dairy farmers.

Objectives

A large scale dairy farm normally develops because small size farms quit while the bigger ones gradually keep growing. But will such a farm – with increasing costs and labour pressure and decreasing income – be able to withstand the international competition? Our network wants to find out whether a coalition of farm enterprises can be an option. On one hand a coalition will give us the opportunity to optimize the use of our labour, qualifications, farm land, buildings, equipment and machinery. On the other hand it will probably reduce the individual financial risks for the participants.
Participating in such a dairy coalition requires topical knowledge and skills in technical, economical, social and logistical fields. And, since it will also limit our individual autonomy, it also requires finding a legal and organisational structure that fits our personalities as well as our financial and social situation.

Matching People

But how to go about? Where and how to find potential partners?
I decided to use my network and the (inside) information from my former position as an agricultural accountant. I invited ten farm families in the region of which I thought to be potential partners and compatible with my idea. Criteria I used were the (assumed) personal characteristics of the people, the farm size and the fact whether they had a successor or not.

After several meetings six farmers decided not to participate in the project to investigate the possibilities to develop the Cow-alition. Their reasons were quite diverse. One decided the process was going too slow for him. Others liked the idea for themselves too. However, they were not interested in the Cow-alition and participated just to get information. And some regarded the meetings as social gatherings without anything to get or to give. In the end also one new member joint the network making it in total five farms. Table 1 lists some characteristics of the participating farmers and farms.

Table 1: Overview of the participating farms in the Cow-alition Network

	Farm size			*Successor present*
	Ha	*cows*	*Milk quota*	
Farm 1	92	52	460,000	yes
Farm 2	32	60	420,000	yes
Farm 3	31	40	320,000	no
Farm 4	39	43	370,000	no
Farm 5	54	71	605,000	yes

There is Profit and PROFIT

Figures clarify so much more than words. Table 2 shows that beside the variable costs all figures are in favour of a Cow-alition.

Table 2. Impression of the cumulated financial results (2005) of the five individual partners and of the Cow-alition when in function (figures in €)

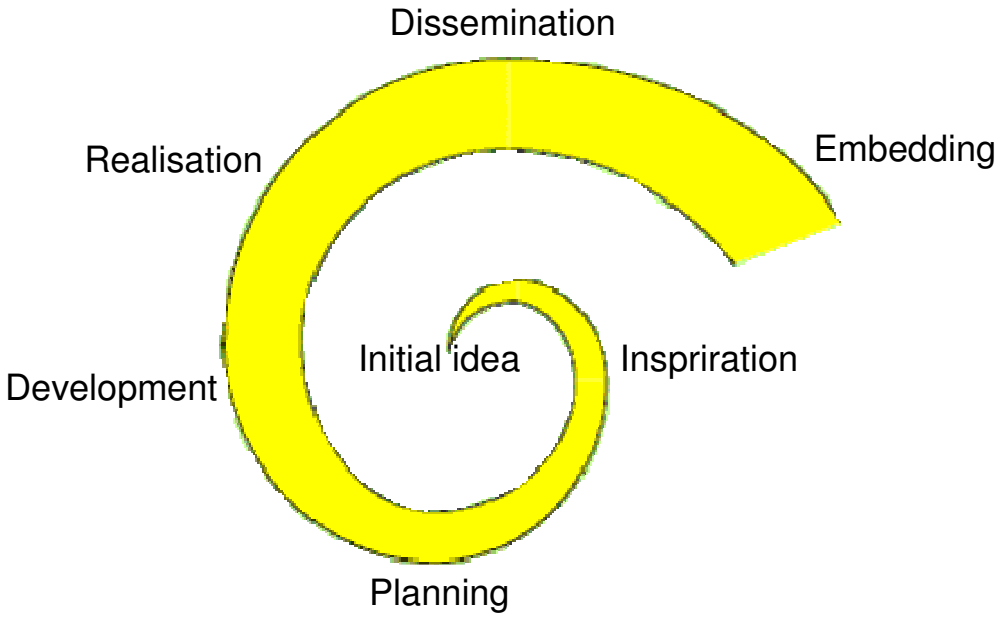
	5 Individuals	*1 Cow-alition*	*Difference ('1-5')*
Yields			
direct	818,000	865,000	+ 47,000
indirect	64,000	138,000	+ 74,000
total	882,000	1,003,000	+ 121,000
Costs			
variable	210,000	240,000	+ 30,000
fixed	422,000	295,000	- 127,000
total	632,000	535,000	- 97,000
Profit	250,000	468,000	+ 218,000
Liquidity	- 106,000	110,000	+ 216,000

In total the results are quite positive for the Cow-alition. For the current potential participants this would mean that the Cow-alition provides enough money for a sustainable growth. Whereas they as individuals would have to undergo the daily struggle in finding the money to grow.

Visualisation

How can the Cow-alition look like? Knowing we still have five private farms (locations with buildings) at the moment we aim to use them all. In our view we want to specialise per location. Regarding our present situation this implies: two locations for milk production, one location for calving (dry period until a week after calving), one location for rearing (calves and heifers) and one location for sales (surplus animals with maybe some fattening first).
We target on establishing the Cow-alition as a single enterprise in 2008. Only then will it be possible to start big investments. The first investment will be to build a dairy farm on one location for all the lactating dairy cows.
Visualising Cow-alition in the Innovation Spiral, see figure 1, would put us in the Development stage. The Innovation Spiral is a tool used in the experiment to visualise the distinctive stages of innovation processes.

Figure 1: Innovation Spiral showing the stages in which knowledge may develop in networks



Managing the Cow-alition

At present the Cow-alition in a preparatory phase. We do not have any far-reaching legal obligations yet, but are investigating several legal constructions. We focus on a construction in which no one stands above the others. We work for a common goal which is primarily an honest farm/family income. This also means equalising the labour input and the compensating other inputs like equipment, land etc.
In 2006 we have tested our cooperative and management skills in the harvest of grass and maize silage (see figure 2). One of us was 'appointed' as the managing coordinator. This was quite a success. In 2007 we will do it again and even better.

Figure 2: Working together in June 2006 to make a good grass silage.

At the moment we are doing a 'personality test' revealing our personal skills, motivation and interests. The result will be openly discussed within the group.

Threats

Communication is the key factor for success, non-communication for failure. On operational level communication is hardly a problem. However, on a personal level farmers in general are not 'communication masterminds' as it comes to expressing the things they like and dislike. I am not an expert in this field but I think it probably has to do with the – most often – individualistic character of the profession they chose. But in our Cow-alition communication about positive and negative experiences is essential. We have to stay open to each other and express our thoughts and feelings. Leaving things unsaid for too long will lift the threshold to communicate about it to a level where communication is not possible anymore. Eventually this will lead to a situation in which we can not work together anymore and thus the implosion or explosion (depending on the emotions) of the Cow-alition.

Opportunities

Together we are strong, very strong. We are strong because we share our qualifications, our views and our thoughts, bringing up new thoughts and ideas to improve our performance. This synergy makes us realise one and one is not two but three! This feeling gives us a lot of positive energy.

Working together also increases the strategic space we have to operate in. It opens up new possibilities. For instance, in 2007 we, as the Cow-alition, took on the lease of 15 ha of distant grassland. No participant could have done that by himself because it would have been too far and too much.

Social Aspects

The social aspect of being in the Cow-alition does not only apply for dairy farmers wanting time for a family/social life. As table 1 shows, two participants do not have successors. Eventually these farmer will go with pension and in general would have to sell all/most of their farm. In most cases this is quite a traumatic experience. Within the Cow-alition the latter is not necessary. Anticipating on the necessity of scaling up c.q. reducing costs (of which labour is one) in the future, participants can stay in the Cow-alition and therefore can still receive an extra income from their capital input without having to sell it.

Support Network Program

As stated in the objectives, participating in a dairy coalition requires topical knowledge and skills in technical, economical, social and logistical fields. In this respect we are very happy the Network Program could facilitate us. The program supports us with a facilitator (contracted from the farmers union LTO) and several researchers of Wageningen University and Research Centre.
Our facilitator, Hanneke Meester, mainly focuses on the process. She keeps us on course. She summarises where we are and helps us in setting new goals and making the plans how to get there. Hanneke also observes. She notices when participants get 'lost' in the process and consequently 'brings them back' (one more score for the threat of non-communication!).
In 2006 researchers of Wageningen UR have helped us in finding the right organisation of the silage making.
At the moment we are investigating several possibilities for a legal construction of the Cow-alition. This research is crucial to us and funded through the budget we receive from the Network Program.

Rhetorical Question

Could or would I have started the Cow-alition initiative without the support of the Network Program? A straight 'yes'! I would have tried, putting all my energy into it. However, I am convinced that without the support of the experiment we would not have been able to get this far; close to realisation! And time flies, for all of us. In other words, it might have been too late for some of us without this support.

Conclusions

1. A coalition of farms gives the opportunity to optimise the use of labour, qualifications and skills, farm land, buildings, equipment and machinery.
2. The Cow-alition provides more income for a sustainable growth than the five farms individually.
3. Communication is the key factor for success, non-communication for failure. Cow-alitions spend a lot of time in matching personalities.
4. Operating in the Cow-alition increases the strategic space to operate in. It opens up new possibilities.
5. Without the support of the experiment the Cow-alition would not have been able to get this far; close to realisation!

A MODEL FOR ENTREPRENEURSHIP TRAINING AND MANAGEMENT SKILLS DEVELOPMENT FOR SUSTAINABLE ECONOMIC GROWTH

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Abstract

This paper proposes a model for entrepreneurship training and management skills development that is aimed at providing the skills needed by new and existing entrepreneurs to construct, implement and manage a strategic business plan. The main stakeholders in the program include university students (all colleges), university faculty and administration, new and existing entrepreneurs, the finance community, community business organizations, other educational institutions and government organizations. The two key components of the entrepreneurship program are 1) teaching strategic and business management concepts, and 2) strategic and business management skills development. The second component is where the real entrepreneurial learning takes place by allowing the student/entrepreneur to employ the management concepts in a practical way. The approaches used include lectures, seminars and cases for the first component and business clinics, industry assessments, marketing research studies, business plans, feasibility studies, and internships and mentoring for the second component.

Key Words: entrepreneurship, education, training, management skills development

Introduction

There is an ever-increasing demand for entrepreneurs in the world today. Both developed and developing countries are trying to lure entrepreneurs with ideas, skills and capital to enhance their economic growth. In many countries the number of retiring entrepreneurs is expected to far exceed the number of home-grown new entrepreneurs over the next 15 to 20 years, as the baby boom generation retires. All governments, regardless of political stripe, have come to the realization that government alone cannot create the kind of economic growth necessary to maintain a competitive standard of living in the world. For any economy to sustain significant economic growth, entrepreneurial risk-takers with new ideas and solid management skills are required.

There are many different statistics presented by the finance community on business failures but usually it is indicated that about 80% of all new business ventures (new start-ups or take-overs) will fail within the first two to five years of operations. When venture capital providers, angel investors or bankers are asked why the failure rate is so high, the number one reason is invariably the same – lack of proper management skills. This is often referred to as the entrepreneurship management skills gap.

There is no substitute for the drive and enthusiasm of an entrepreneur. The tremendous will to succeed that is inherent in entrepreneurs is the most critical requirement for success. Not everyone has the inherent characteristics of an entrepreneur and no amount of education or training can instill these qualities. However, while these inherent qualities are essential, they are not necessarily sufficient by themselves to create success in business. Many entrepreneurs are simply not ready to manage their business when they want to start operations. In some cases they do not know who their customers are or what they want or how to find out what their customers want. In many cases the entrepreneurs' belief is that "if we build it, they will come" as opposed to "find out what your customer wants and give it to them". Entrepreneurs often do not understand or have not considered the most basic principles associated with business competition such as Porter's (1985) declaration that in competitive industries you must choose to become either a cost leader or differentiate your product. Entrepreneurs need to know their marketplace and

decide how they will manage their business; whether they choose to be a cost leader or differentiate their product, their business plan must show how they will do it. They must understand where they fit in the value chain, know the importance of building relationships within the chain, and how they might capture some of the profits of the chain captain (or whether they will strive to be the chain captain). When an entrepreneur is asked these very basic questions; "What is your competitive advantage?" or "Will anyone want to buy your product/service, why, who is it, where are they and how will you get it to them?", too often the responses have shown that the entrepreneur has not addressed or researched these critical questions. Entrepreneurs need to understand these strategic management concepts so that they can formulate a strategic plan. After this 'big picture' assessment, the entrepreneur must be able to develop a detailed business plan that shows how the business will be managed to carry out the strategic plan; the operations, human resources, marketing and financial plans must all be integrated with the overall strategic plan.

Completing the appropriate research and planning along with having the necessary management skills are key ingredients to having a successful business. Figure 1 illustrates this process of business idea conception to implementation of the business plan. There are many entrepreneurs with a good business idea but few who are able to complete the process illustrated in Figure 1. As a result, entrepreneurs often try to run with an idea before it is ready, approaching bankers or other sources of financing with just the idea and no strategic plan, let alone a business plan. They then become very disheartened when a banker turns them down because they feel their idea is a sure thing and a business plan is simply alot of extra and unnecessary work. However, if they have not gone through the strategic and business planning process, it is almost a guarantee that there are possibly hundreds of questions still to be answered just to assess whether the business is feasible, i.e. has a reasonable chance of success. Moving forward before these questions have been addressed is extremely risky and significantly increases the probability of failure.

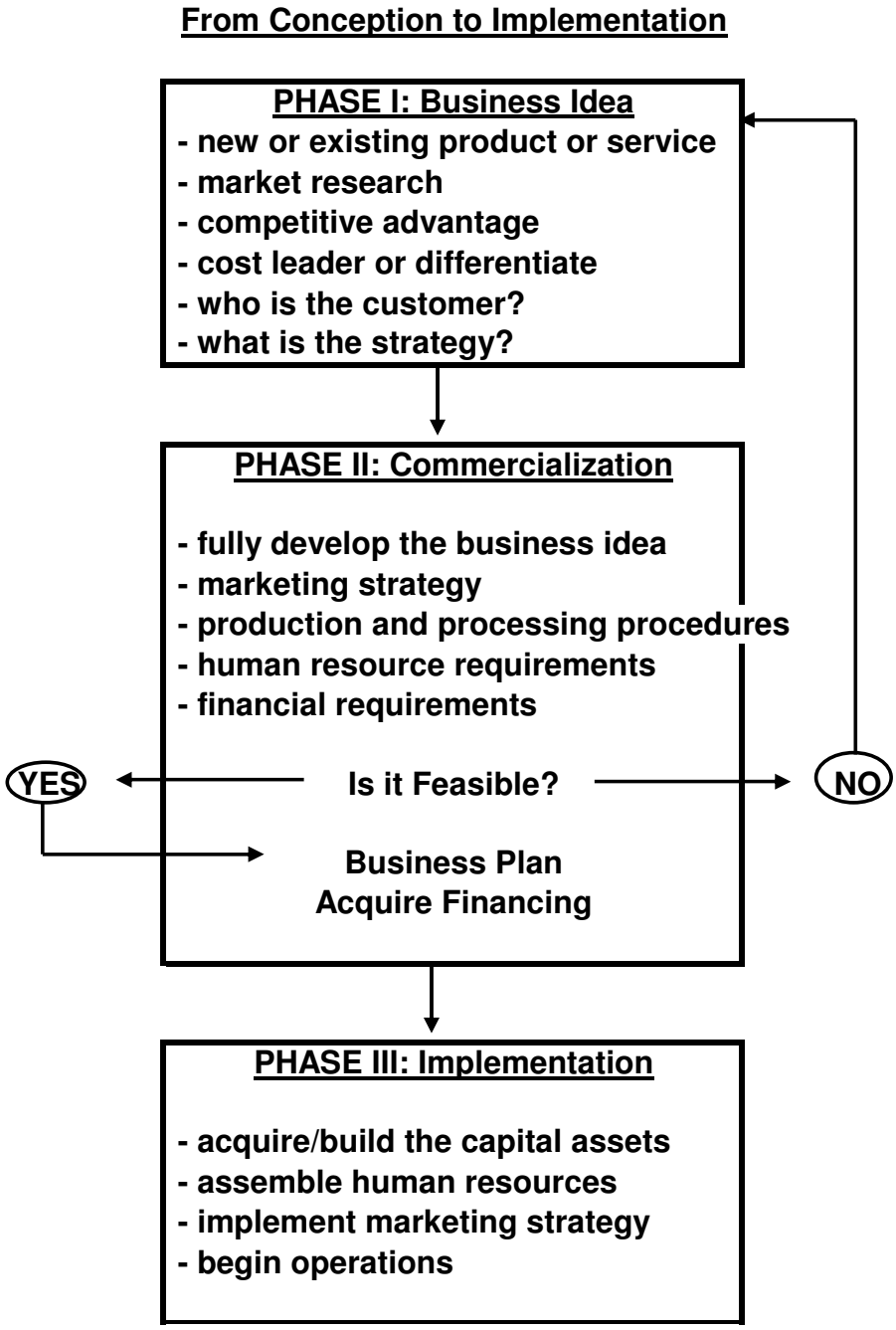
What is needed to reduce the failure rate and increase the number of successful entrepreneurs in an economy? This paper proposes a model for entrepreneurship training and management skills development that is aimed at providing the skills needed by new and existing entrepreneurs to construct, implement and manage a strategic business plan. This model is based on ten years of experimentation at the University of Saskatchewan, Canada. Several faculty members from the business and agriculture colleges have been involved in various internal and external training programs with a view to closing the entrepreneurship management skills gap[1].

What is needed to reduce the failure rate and increase the number of successful entrepreneurs in an economy? This paper proposes a model for entrepreneurship training and management skills development that is aimed at providing the skills needed by new and existing entrepreneurs to construct, implement and manage a strategic business plan. This model is based on ten years of experimentation at the University of Saskatchewan, Canada. Several faculty members from the business and agriculture colleges have been involved in various internal and external training programs with a view to closing the entrepreneurship management skills gap[2].

[1] The University of Saskatchewan faculty members involved have been Marv Painter, Brooke Dobni and Alison Renny from the College of Commerce, and Bill Brown and Tom Allen from the College of Agriculture.

[2] The University of Saskatchewan faculty members involved have been Marv Painter, Brooke Dobni and Alison Renny from the College of Commerce, and Bill Brown and Tom Allen from the College of Agriculture.

Figure 1: From Conception to Implementation



The Stakeholders

There are a number of important stakeholders in this university-based entrepreneurship training and management skills development program. The first and most important to us is our students at the University of Saskatchewan. In the College of Commerce, we have been delivering entrepreneurship and management training to our business students for many years and recently the colleges of Agriculture and Engineering, in partnership with Commerce, have begun delivering entrepreneurship programs. The College of Arts and Science has requested from Commerce a 6-course minor in entrepreneurship based on very positive indications of demand in a recent poll of Arts and Science students. Other colleges are also expressing interest such as Pharmacy, Kinesiology, Medicine and Dentistry. Overall, the demand for entrepreneurship and management training from university students is increasing and we plan to meet that demand with new programs.

A second important stakeholder is our faculty and administration personnel. In order for us to be successful in offering new entrepreneurship programs, we need commitment from both of these groups. From faculty, we need people who are committed to the development and delivery of the programs as well as commitment to the overall goals from faculty who are not directly involved with entrepreneurship. From administration, we need commitment to entrepreneurship and the investment funding that is required to develop the programs. If all groups are committed, new entrepreneurship programming can be developed and delivered efficiently and effectively.

New and existing entrepreneurs, who are not our students, are a third important stakeholder. These are people who may be managing existing ventures, are planning to start a new venture, want to purchase an existing venture, are looking for a business venture, or want to learn more about entrepreneurship and management. These people are external to the university and our programs need to reach out and engage them.

There are a number of other stakeholders that need to be involved in the planning, development and implementation, such as the finance community (venture capital providers, angel investor groups, banks and credit unions), community business organizations (chamber of commerce, regional economic development associations, young entrepreneurs groups, women's entrepreneurs groups, aboriginal business organizations), other education institutions (other universities, technical institutes) and government organizations (provincial and federal government entrepreneurship programs and initiatives).

An advisory board representing all of the stakeholders guides the on-going development and implementation of the entrepreneurship education and training programs. The first function of the advisory board is to provide advice on programming for internal university programs (programs for our own students), and for external entrepreneurship programs (programs for entrepreneurs who are not university students). The second function is to facilitate learning and business linkages, such as; having successful entrepreneurs provide presentations, internship and mentoring; linking entrepreneurs with students for completion of marketing research studies, business plans, feasibility studies, and other business research; developing a network for matching retiring entrepreneurs with young entrepreneurs who are interested in buying existing ventures. The network assists with the matching as well as completion of business plans and strategies, financing arrangements (vendor financing, angels, banks, etc) and early mentoring. The third function of the advisory board is to participate as panelists, presenters, and judges at an annual entrepreneurship conference, which includes a business plan competition, new ventures competition, and so on. The 12 member advisory board is made up of 7 private entrepreneurs and one member from each of the following groups; finance community, provincial government, Chamber of Commerce, Women's Entrepreneurs, and Young Professionals and Entrepreneurs. Other representatives at advisory board meetings are faculty and student representatives.

Key Components of the Programs

The two key components of the entrepreneurship training and management skills development programs are 1) teaching strategic and business management concepts, and 2) strategic and business management skills development. The first component provides the student/entrepreneur with the management concepts required to successfully manage a business, including accounting, finance, marketing and human resource management concepts. These concepts are delivered using case studies that describe successful and unsuccessful entrepreneurial ventures. The second component is where the real entrepreneurial learning takes place by allowing the student/entrepreneur to employ the management concepts in a practical way. The approaches used include lectures, seminars and cases for the first component and business clinics, industry assessments, marketing research studies, business plans, feasibility studies, and internships and mentoring for the second component.

Business Clinics

Business clinics are meetings held to discuss a current business problem or opportunity. New or existing entrepreneurs are invited to attend a session that includes a faculty member and usually 4 to 6 students. The entrepreneur can describe a current business problem, after which the faculty member and students will engage in a discussion about potential solutions. If the solutions require more research or a financial assessment, some of the students will opt to take on the project, working with the faculty member and entrepreneur to assess, plan and implement a business solution. Similarly, the entrepreneur may outline an idea for a new product or service and requires an industry analysis or a marketing research study. If a project idea has already been researched, students will be involved in helping to determine a strategy and complete a feasibility study or a business plan. This is very useful for entrepreneurs to springboard their ideas, discuss pros and cons, evaluate different strategies, and so on.

Industry Assessments, Marketing Research Studies, Feasibility Studies, Business Plans

Experience has shown that students and entrepreneurs never learn as well as when they are applying strategic management and business concepts to real business problems or opportunities. The projects are completed under the supervision of a faculty member, with the main goal being education and experience for all three parties; students, entrepreneur and faculty member. For students, we have found the project approach to provide a much higher rate of learning and retention than lectures or case study approaches. However, the project approach is combined with lectures and case studies to make sure that students understand the concepts associated with strategic planning, marketing research or business planning before they actually take on the project.

Many entrepreneurs who have been involved, especially new entrepreneurs, have learned that market research, strategic planning and business planning can significantly increase the chances of success. Many have also realized (albeit reluctantly) that their initial idea was simply not feasible and had they not engaged in the research process, they likely would have failed had they proceeded with the business idea. They also often find that there is much more to learn about business management and that the learning never stops for any of us.

Internship and Mentoring

Developing and maintaining close ties with the business community allows us to partnership with existing and retired entrepreneurs for student internships and mentoring. The internships involve a student working at an entrepreneur's place of business, usually for the four summer months. The objective is for the student to experience day to day management issues but also be involved as much as possible in the strategic business planning. It is important that the student is not simply put into a low level position for the four months, where learning is minimal. Ideally the student is given some responsibility for day to day management as well as a project associated with strategic planning such as a competitor analysis, market research for existing or new products/services, efficiency analysis, and so on. By the end of the internship, it is expected that the student will have a much better appreciation for the inner workings of a business, from front line to board room.

Management Training for New and Existing Entrepreneurs

One of our most important objectives is to provide our students with the management training and skills needed to be successful entrepreneurs. We have also developed a number of external training programs that are aimed at entrepreneurs who are not our students. One young entrepreneur made a very telling statement when he indicated that the main restriction in growing his business was not competition or government regulation but the speed at which he was able to grow his management skills. Our external programs respond to that need.

The main external program is a six course certificate program (delivered in evening classes) that teaches accounting, marketing, finance and human resources, all in an entrepreneurial context. There is also a course in strategic management and the capstone is a business planning course, where the participant is required to complete an actual business plan. We encourage participants to complete a strategic business plan for the venture they plan to pursue. At this point we can involve mentors and students to assist the entrepreneur; however the entrepreneur must take full responsibility for completion of the plan. Entrepreneurs may take this course while they are developing their business ideas and we encourage them to use our business clinics and students to have marketing research or industry analysis competed for their ventures.

Two other external training programs are offered. One is an intensive one-week program that is aimed at successful entrepreneurs who need to enhance and upgrade their management skills. This program brings participants up to date on strategic planning issues, current markets and marketing challenges, as well as current human resource and financial issues. It employs many case examples, requires a high level of participation, provides networking time and it is generally the case that participants will learn as much or more from each other than from the faculty who are facilitating the sessions.

Another external program is designed to have entrepreneurs develop their own business plan over a two month period while they also complete approximately 30 hours of in-house training designed to develop their business planning skills. By the end of the two month period, they are expected to present their completed business plan. Unfortunately, this program has not been successful because very few of the participants have actually completed a business plan. They are usually trying to complete a business plan while they continue to manage their business(es), and when they find out how much time and effort is required to complete a business plan, they decide that they don't have the time. Our plan to remedy the problem is to have students work with these entrepreneurs (through the business clinics) where the students will do most of the time consuming research, under the guidance of the entrepreneur and a faculty member. We will strongly encourage the entrepreneur to remain engaged with the students as the project is being completed.

Facilitating New Venture Start-ups, Buyouts and Financing

One of our stakeholders is the finance community and we include them as guest speakers and mentors. This gives our students a better understanding of what debt or equity suppliers are looking for in a financing proposal or a business plan. Students also are able to see the differences between banks or other debt providers' requirements and equity providers such as venture capital or angel investor networks. Knowing what these finance groups look for in a proposal helps an entrepreneur considerably when it comes to seeking funds.

Another common source of financing has been vendor financing. With many baby boom entrepreneurs retiring, there is a growing number of existing businesses for sale which provides many good opportunities for our students and other entrepreneurs. According to the Business Development Bank of Canada, there will be over 500,000 business owners wanting to sell in the next 10 years. We are planning to include in our program an opportunity for retiring entrepreneurs to participate as vendors, making their business available to students or entrepreneurs who may want to complete a business plan with the intention to purchase the business. In the event that the ensuing proposal included vendor financing, it would provide the vendor with an excellent opportunity to assess the student or entrepreneur's management abilities by working with them on the business plan. This program would also be beneficial for a retiring vendor who wants to sell to his or her employees, where the employees need to enhance their management skills before taking over.

Summary of Stakeholder Participation

Table 1 provides a brief description of the activities expected for each stakeholder for each of the venture phases.

Table 1: Stakeholder Activities

Participant	Phase 1: Business Idea	Phase II: Commercialization	Phase III: Implementation
Faculty	Training and facilitating for opportunity assessment, market screening, pre-feasibility assessment Research	Training and assistance for development of market research studies, feasibility studies, business plans, etc. Research	Mentoring Write Case studies Research
Students	Develop opportunities for new products and services Seek market opportunities with existing businesses Strategic Market Assessment	Completion of marketing research studies, industry analysis, feasibility assessments, business plans	Implement their business plans by starting a new business venture or purchasing an existing business
New Entrepreneurs	Identify new product or service ideas Targeted business acquisitions Entrepreneurship management training	Work with students and mentors to prepare marketing research, feasibility study and business plan	Implement their business plans
Existing Entrepreneurs	Expansion plans (new and existing products or services, geographical expansion, etc) Entrepreneurship management training	Work with students and mentors to prepare marketing research, feasibility study and business plan	Implement their business plans Internships Mentoring
Entrepreneurship Advisory Board	Presentations and advice on opportunity identification Advise and critique student-identified opportunities Mentoring	Mentoring and advising for completion of commercialization studies and business plans Student Internships	Mentoring and advising to students and entrepreneurs who are implementing their business plans
Finance Community	Presentations to students Advice to entrepreneurs	Presentations, mentoring, advising	Provide Financing to feasible business plans
Community Business Organizations	Networking facilitation	Networking facilitation	Networking facilitation
Governments	Government programs to assist entrepreneurs Government grants, providing export assistance, reducing red tape		

Table 2 provides a summary of what each participant is expected to contribute to and receive from the entrepreneurship programs.

Table 2: Stakeholder Inputs and Outputs

Participant	Provide to the Program	Receive from the Program
Faculty	Teaching, organizing, facilitating Student advising and mentoring	Business experience Case Studies Research Projects
Students	Complete marketing research studies, feasibility studies, opportunity assessments, business plans	Business education with a focus on applied entrepreneurship Networking with other entrepreneurs Opportunity to start own business
New Entrepreneurs	Product and Service ideas for new ventures and acquisitions and request for assistance with research and business plans	Business Clinics Assistance with three phases of venture commercialization
Existing Entrepreneurs	Requests for improvement of business performance Ideas for expansion and request for assistance with business plans	Business Clinics Assistance with problem solving, marketing research and business plans
Entrepreneurship Advisory Board	Program Planning Mentoring and advice to students and other entrepreneurs Classroom presentations Annual Competitions Participation	Networking opportunities within the entrepreneurial community Recognition for helping to grow the entrepreneurial community and economy
Finance Community	Advice and mentoring Classroom presentations	Potential clients and exposure to the entrepreneurial community
Community Business Organizations	Networking facilitation for all participants	Potential members Recognition for helping to grow the entrepreneurial community and economy
Governments	Assistance programs for entrepreneurs	More entrepreneurs Improved economic growth Larger Tax Base Retain more youth and entrepreneurs

Conclusion

We believe that the most effective way to increase the business success rate amongst entrepreneurs is through improved and enhanced management training and skills development. This applies to students and new entrepreneurs who are planning to start or buy their own businesses and to existing entrepreneurs who are always looking for ways to improve their business performance. Our education model contains a passive learning component (lectures, assignments, case studies) but the most important is the active learning component, where participants (students and entrepreneurs) are expected to operationalize their business knowledge and apply their management skills through development and implementation of real business plans. We believe this approach to learning best suits entrepreneurs – learning by doing, while being guided by faculty, successful entrepreneurs, financiers, and others from the business community. In total, we have designed a program that will guide an entrepreneur through the three phases of business startup and leave them with a set of management skills that will increase their probability of success in the future.

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TRAINING COMMERCIAL FARMERS HOW TO ANALYSE AND RANK RISKY ALTERNATIVES

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Abstract

Risk management is a major challenge for farm managers. Monte Carlo simulation models can be used to teach commercial farmers how to manage risk. However, the decision tools for ranking risky alternatives have long been an impediment to learning the art of ranking risky alternatives. New risk ranking tools available in a Microsoft® Excel add-in, Simetar, take the art out of ranking risky alternatives. SERF and StopLight charts in Simetar are demonstrated by ranking risky alternative marketing, crop mixes and crop insurance strategies available to a representative crop farm.

***Key Words**: Risk Management, SERF, Stochastic Efficiency, StopLight, Simetar, Simulation*

Introduction

Risk management is a major challenge facing farm managers. In the future, price risk is likely to increase with globalization of agricultural commodity markets. Production risk may increase as farmers experiment with growing different crops and new varieties that require a different bundle of management skills.

Farm size will not be a reliable predictor of which farms will survive in the future. Rather, the farmers who survive and prosper will be those who are good risk managers. Risk management skills are not inherited and are not proportional to the size of farm a farmer inherits or marries. Rather risk

management skills are learned. With the increased need to manage risk and the fact that risk management skills are learned, there is a growing need to train commercial farmers how to analyze and rank risky alternatives.

The increased demand for risk management training comes at a time when there are more tools available for training farm managers than ever before. Microsoft 7 Excel is widely used by farm managers to develop budgets, project cash flows, and evaluate Awhat if ...@ management options. Adding risk to Excel spreadsheet budgets, cash flow models, and Awhat if ...@ analyzers is easy due to add-ins, such as Simetar[1] and @Risk.

Simply adding risk to an Excel spreadsheet model, however, does not help farm managers analyze and rank their risky alternatives. Farm managers need a straightforward method to analyze and rank their preferred choice among risky alternatives that is easy to use.

The objective of this paper is to demonstrate how the risk ranking tools in Simetar can be used to rank alternative risk management strategies so the results are easily understood and useful to farm managers. The steps for developing a spreadsheet model of a representative mid-west grain farm are presented using the equations in simple pro-forma financial statements. The steps for making the model stochastic are described using functions in Simetar. Alternative management strategies are simulated and ranked using rigorous risk ranking procedures in Simetar to show how farm managers can apply advanced risk analysis tools to farming decisions.

Steps to Develop a Simulation Model

The steps to develop a Monte Carlo simulation model are outlined by Richardson (2006). The first step is to determine the purpose of the model; in this case, it is to develop a probabilistic forecast of the economic viability for a representative farm. The second step is to identify the key output variables (KOVs) necessary to satisfy the objective of the model, e.g., net present value (NPV), rate of return on investment (ROI), annual net cash income, and annual ending cash reserves. The third step is to write out the equations necessary to calculate the KOVs and in the process identify the stochastic and exogenous variables in the model. The equations to calculate the KOVs for a crop farm are the accounting equations in the pro-forma financial statements: income statement, cash flow and balance sheet.

[1] Simetar, Simulation & Econometrics To Analyze Risk, is an Excel add-in for estimating parameters of probability distributions, simulating Monte Carlo models, developing charts of stochastic results and ranking risky alternatives. Simetar was developed by Richardson, Schumann, and Feldman (2005) for teaching risk analysis and conducting risk analyses at Texas A&M University.

After identifying the stochastic variables, the analyst must estimate the parameters to describe and simulate the probability distributions for the random variables. Richardson, Klose and Gray (2000) recommend using a multivariate empirical (MVE) distribution expressed as fractional deviations from trend or mean to simulate random variables when dealing with limited data. The MVE distribution appropriately correlates random variables so the historical correlation among the random variables is maintained in the simulated variables.[2]

The analyst should validate that the simulated random variables reproduce their respective means and the historical correlation. The final step in model development is programming the equations for the pro-forma financial statements using the stochastic variables, forecasts of exogenous variables, and assumed management values for the farm.

Demonstrate the Steps for Model Development

The steps for developing a farm simulation model are demonstrated using an Excel model of a representative grain farm. The purpose of the model is to analyze the benefits of alternative management practices on economic viability over a five year planning horizon. The next section describes the process used to gather the data and the management scenarios to be analyzed and ranked.

Subsequent sections describe parameter estimation for the stochastic variables and validation, followed by a discussion of the equations for the model. The final section of the paper presents examples of the results and demonstrates how the risky alternatives can be ranked with risk ranking tools in Simetar.

Representative Grain Farm

Data for a Midwest representative grain farm was developed using a focus group interview process by the Agricultural and Food Policy Center (Outlaw, et. al., 2007). The focus group was made up of five grain farmers selected by the county agent who are representative of commercial-scale farmers in the area in that they are full-time farmers, typical in size, crop mix, soil type, and tillage system. The focus group interview provided information regarding farm size, crop mix, variable production and harvesting costs, fixed costs, yield histories, farm program history, land tenure arrangement, asset values, rental costs, and machinery inventory.

[2] Simetar has a one step function to simulate MVE distributions which estimates the parameters and simulates the random variables. As a consequence this step in model development is perhaps the easiest step in developing a Monte Carlo simulation model for risk analysis.

The representative grain farm model was simplified for the example by excluding farm program payments and machinery replacement over the five year planning horizon. The data to describe and simulate the farm are presented in the first 60 lines in the printout of the model presented in the Appendix[3]. The Appendix is a printout of the simulation model for one realization (or iteration). The bold values in the input section (lines 1-60) can be changed by the user to test alternative "what if…" questions[4].

The model is designed to simulate the farm for four different combinations of cash sales/forward contracting (lines 46-48), four different crop mixes (lines 50-52), and four levels of crop insurance coverage levels (lines 56-59). The SCENARIO() function in cells C47, C48, C51, C52, and C56-C59 show the values for the Base scenario. During simulation Simetar uses the values for the other three scenarios in order.

Parameter Estimation for MVE Distribution

The stochastic variables for the representative farm are annual prices and yields for both corn and soybeans. The historical data for these four random variables are presented in lines 69-82 in the Appendix. The yields are annual values for any farmer in the focus group rather than using county average yields that have less variability than would be experienced by a single farmer. The prices are national season average prices. The variables were tested for the presence of a linear trend (lines 91-98) using the trend icon in Simetar and a statistical trend was not found for any of the variables, based on the high p values (Prob(T) greater than 0.05).

A correlation matrix of the four random variables (lines 100-105) was estimated using the Correlation Matrix icon in Simetar. The results of the correlation matrix showed that two of the correlation coefficients are statistically different from zero (bold values). Once it is determined that significant correlation is present among the random variables, a multivariate distribution must be used to avoid biasing the means and variance for the KOVs.

Parameter estimation and simulation for an MVE distribution is handled internally in Simetar using the MVEMP() function. The MVEMP() function uses as its input: the historical data for the random

3 The line numbers and cell names in the Appendix printout of the model are referred to throughout the paper to indicate how the simulation model is organized and the types of equations included.

4 The complete model and a Free Trial copy of Simetar are available on the www.simetar.com website.

variables (lines 71-82), the forecasted means for a particular year (lines 116-119),[5] and an option to estimate the parameters as fractional deviations from the mean[6]. The function is repeated for each year (B123:B126, C123:C126, … , F123:F126) with that year's respective means. The =MVEMP( ) functions for simulating the four random variables for the fifth year (F123-126) are displayed in cell G123.

Statistical validation tests included in Simetar were used to validate a 500 iteration sample of random values for the MVE distribution. The validation tests failed to reject the null hypotheses that the simulated data reproduced the historical correlation and the simulated means were equal to their assumed values.

Financial Statements

Once the random variables are simulated they are used in the equations to calculate variables in the pro-forma financial statements. For a representative farm, annual crop production is the first variable to calculate (lines 130-132), using the equation for crop i in year t:

$\mathbf{ProdCrop}^{7}_{it} = \mathbf{Yield}_{it} * \text{Planted Area}_{it}$

Market receipts for each crop (lines 139-141) are calculated using a weighted price based on the marketing scenario (fraction of the crop sold at market and the fraction of the crop contracted at a fixed price):

$\mathbf{Receipts}_{it} = \mathbf{ProdCrop}_{it} * ((\mathbf{National\ Price}_{it} + \textit{Local Basis}_{i}) * (1 - \text{Contract Fract}_{i}) + \textit{Contract Price}_{it} * \text{Contract Fract}_{i})$

The formulas for simulating crop insurance scenarios are programmed in lines 146-154 so the indemnities are available for use in the Income Statement. Updated annual production costs per hectare, harvesting costs per kg, and fixed costs are calculated using their base values for 2007 plus an inflation rate adjustment fraction for each year (lines 157-166).

---

5 Projected values for the farmer's expected yields over the planning horizon (lines 29-30) and projected mean prices, prime interest rate, and rate of inflation (lines 63-67) from the FAPRI January 2007 Baseline are used to simulate the 2007-2011 horizon.

6 Given that the historical data does not show the presence of a linear trend, the MVE was estimated and simulated as fractional deviations from the mean using option 1. The MVEMP() function is an array function so the random values it simulates are simulated simultaneously using the implicit correlation matrix in the historical data.

7 Variable names in bold indicate the variable is either stochastic or is a function of a stochastic variable. Variable names in italics are constants assumed for the farm.

The Income Statement (lines 171-190) has two parts: receipts and expenses. The values in the receipts section are calculated earlier so they are cell referenced into the Income Statement (see G173-G176). The formulas displayed in column G of the Appendix indicate the actual formulas for the last year in column F of the spreadsheet model.

Expenses for crop production and harvesting are calculated individually for each crop (lines 179-182) for ease in verifying the model. Expenses for annual land rent and fixed costs are added to variable costs to calculate the operating loan interest expense using the formula:

Operating Interest$_t$ = Σ (**Variable Costs**$_t$ + *Fixed Costs*$_t$) * Interest Rate$_t$ + *Fraction of Year*

where: Fraction of Year is the average length of time the operating loan accrues interest, usually 0.6 for crop farms. To account for negative cash flows, the analyst must include line 188 in the Income Statement to calculate interest for cash flow deficit loans in the previous year. Net cash farm income is calculated as total receipts minus total expenses (line 190).

The Cash Flow Statement (lines 191-203) calculates cash inflows and outflows. Inflows of cash (line 195) include net cash income from line 190, beginning cash reserves, and interest earned on cash reserves. Beginning cash reserves on January 1 (line 192) equal cash assets on December 31 of the previous year (line 205). For a stochastic farm model one must include line 198 which forces the farm to repay short-term loans from the previous year's cash flow deficit (line 210).

Ending cash reserves (line 203) can be positive or negative. If ending cash is positive it is an asset in the Balance Sheet (line 205). If ending cash is negative it is a liability (line 210) and must be included as such in the Balance Sheet. Land value is inflated using an assumed rate of inflation in cell B9. Land debt is reduced each year as the current loan is repaid. Net worth equals assets minus liabilities.

Financial ratios and summary variables are calculated last in the simulation model (lines 214-229). NPV is calculated using the formula:

NPV = -*Beginning Net Worth* + Σ[**Family Living**$_t$/$(1 + i)^t$] + **Ending Net Worth**/$(1 + i)^5$

where: i is the discount rate of 0.125. Any financial ratio of interest which is a function of variables included in the pro-forma financial tables can be calculated and used to rank risky alternatives. A KOV table (lines 231-257) is a list of all output variables for the statistical summary of a stochastic analysis. The simulated values for a variable provide an empirical estimate of the variable's probability distribution. The empirical distributions can be presented in charts and used with various risk ranking procedures to rank risky alternatives.

Risk Ranking Tools in Simetar

Simetar includes utility based risk ranking tools as well as capabilities to develop charts for displaying risk associated with risky alternatives. Stochastic dominance is available in Simetar and can be run using a single icon on the toolbar. Stochastic dominance rankings, however, are difficult to interpret for lay users and may result in inconclusive rankings.

A more robust and easier to interpret method for ranking risky alternatives is stochastic efficiency with respect to a function or SERF (Hardaker, et al 2004). Simetar provides a toolbar icon for ranking risky alternatives using SERF. The SERF rankings are presented in a chart which shows the certainty equivalents (CE) for each scenario over a range of risk aversion levels, so we do not have to know a decision maker's risk aversion coefficient. Assuming the decision maker prefers more to less, the scenario with the highest CE line is the preferred risky alternative for decision makers with a particular level of risk aversion. The SERF chart can be developed using a range of risk aversion from risk neutral (RRAC of zero) to extremely risk averse (RRAC of 4.0) to cover the full range of rational decision makers[8].

StopLight charts can be developed to display and rank risky alternatives. StopLight charts are stacked bar charts which show the probability of a risky alternative failing to achieve a minimum goal and the probability of exceeding an upper goal. StopLight charts are easy to use for decision makers not comfortable with utility based risk ranking tools.

Ranking Risky Alternatives

The results for simulating the Base scenario are summarized in Table 1. Average NPV is $98,000 with a range from -$160,800 to $395,600. Average net cash income in year one ranges from -$74,300 to $289,300, so the farm faces considerable risk. The cumulative distribution function for NPV under the Base scenario is presented in Figure 1 and shows there is a 13 percent chance that the farm will have a negative NPV.

Four alternative marketing strategies were simulated to determine which would be preferred. The Base scenario assumed all of the crops were sold at harvest and each alternative scenario contracted a different fraction of the crops at a fixed price. The empirical probability distributions for NPV estimated from the

[8] Anderson and Dillon (1992) proposed the following schedule for indicating a person's relative risk aversion: zero is risk neutral, 1 is normal risk aversion, 2 is slightly risk averse, and 4 is extremely risk averse.

simulation are summarized in Figure 2. Because the CDFs cross one cannot determine which would be preferred by a risk averse decision maker using the CDF chart. The SERF chart for ranking the four marketing alternatives (Figure 3) presents the decision maker's CE at relative risk aversion levels ranging from risk neutral (zero) to extremely risk averse (four) for each risky alternative[9]. The decision-maker would prefer marketing alternative four regardless of their level of risk aversion, because scenarios four's CE line is the highest for each risk aversion level. If scenario four is not available, then scenario three would be preferred by all risk averse decision makers. A StopLight chart of the same four marketing scenarios indicates that scenario four is preferred because it has less red (probability of negative NPV is zero) than the other scenarios (Figure 4).

A second risk ranking example is provided for alternative crop mixes (lines 50-52). The risk ranking results are provided in Figure 5, where the second scenario is preferred by all risk averse decision makers.

The third example of ranking risky alternatives involves ranking four scenarios that include the marketing, crop mix and crop insurance scenarios in lines 46-59 of the Appendix. The summary statistics for the four risky alternatives are summarized in Table 2 to show the significant difference that the scenarios make on the relative risk for the farm's NPV and ROI. The estimated empirical distributions for the four NPV distributions are summarized as CDFs in Figure 6. SERF ranks the risky alternatives: four, two, three, and one (Figure 7). The StopLight chart ranking of the four scenarios shows that scenario four is ranked first because it has the most green and the least red (Figure 8).

[9] The Power utility function with relative risk aversion coefficients ranging from 0 to 4 is used for the analysis because NPV reflects a multiple year income distribution. For annual decisions the Negative Exponential utility function with absolute risk aversion coefficients over the range of zero to four divided by net worth is suggested.

Table 1: Summary Statistics for the Base Sceenario

Table 1. Summary Statisitics for the Base Scenario

	Net Present Value	Average Return On Investment	Present Value of Ending Net Worth		
Mean	98,058	18.1%	538,766		
Standard Deviation	87,581	6.3%	81,246		
Coefficient of Variati	89	34.75	15		
Minimum	(160,865)	1.8%	294,183		
Maximum	395,600	41.5%	811,756		
Probability Less than Zero					
P(X<0)	13.0%	0.0%	0.0%		
Net Cash Income	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Mean	66,933	85,095	81,836	77,232	72,609
Standard Deviation	78,830	82,339	79,630	84,801	86,091
Coefficient of Variati	118	97	97	110	119
Minimum	(74,337)	(62,040)	(50,241)	(79,984)	(75,567)
Maximum	289,319	308,159	314,815	313,561	307,744
Ending Cash Reserve	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Mean	63,078	72,767	79,076	79,320	73,978
Standard Deviation	57,544	83,985	105,149	127,004	146,408
Coefficient of Variati	91	115	133	160	198
Minimum	(61,731)	(163,465)	(252,941)	(260,329)	(366,770)
Maximum	202,685	295,674	390,399	450,601	565,914
Probability of Negative Ending Cash					
P(EC<0)	16.0%	20.2%	22.0%	27.2%	30.6%
Probability of Negative Ending Cash for Two Years in a Row					
P(EC<0 for 2 Years)	N/A	11.0%	15.6%	17.4%	22.4%
Return on Investment	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
Mean	16.3%	19.4%	19.0%	18.2%	17.4%
Standard Deviation	13.1%	13.7%	13.2%	14.1%	14.3%
Coefficient of Variati	8060.7%	7049.2%	6955.6%	7720.7%	8198.8%
Minimum	-7.3%	-5.1%	-3.2%	-6.6%	-5.1%
Maximum	53.2%	56.4%	57.6%	57.3%	56.2%

Table 2. Comparison of Risk Across Alternative Risk Management Scenarios for a Representative Farm.

	Base	Scenario 2	Scenario 3	Scenario 4
Net Present Value				
Mean ($)	86,486	107,567	100,467	120,332
Standard Deviation ($)	139,399	105,458	108,116	94,138
Coefficient of Variation (%	161.2	98.0	107.6	78.2
Minimum ($)	(339,093)	(249,204)	(288,638)	(209,499)
Maximum ($)	490,380	403,397	414,870	373,552
Prob(NPV < 0)	26.4%	13.6%	17.5%	10.7%
Average Return on Investment				
Mean (%)	18.9%	19.0%	19.1%	20.2%
Standard Deviation ($)	9.8%	7.3%	7.5%	6.6%
Coefficient of Variation (%	51.9	38.5	39.4	32.8
Minimum ($)	-5.8%	-1.1%	-2.9%	0.4%
Maximum ($)	50.3%	41.9%	42.9%	39.5%
Prob(ROI < 0)	2.3%	0.8%	0.5%	0.0%
Present Value of Ending Net Worth				
Mean ($)	524,156.1	546,251.0	539,168.9	558,509.4
Standard Deviation ($)	130,803.7	98,907.2	101,430.4	88,131.7
Coefficient of Variation (%	25.0	18.1	18.8	15.8
Minimum ($)	115,507.9	204,555.5	166,355.9	245,044.7
Maximum ($)	897,017.2	817,501.1	827,788.0	791,116.3
Prob(PVENW<Beg NW)	72.7%	70.9%	73.7%	69.0%

Base assumes selling all of the crops at market without contracting, 50% of land planted to corn and 50% planted to soybeans with no crop insurance.
Scenario2 assumes contracting 20% at a fixed price, 66% of cropland planted to soybeans and 75% yield coverage is elected for crop insurance.
Scenario 3 assumes that 60% of cropland is planted to corn, 50% of the crop is contracted at a fixed price and 70% yield coverage is elected for crop insurance.
Scenario 4 assumes that 66% of cropland is planted to corn, 100% of the crop is contracted at a fixed price and 65% yield coverage is elected for crop insurance.

Figures: 1 – 8

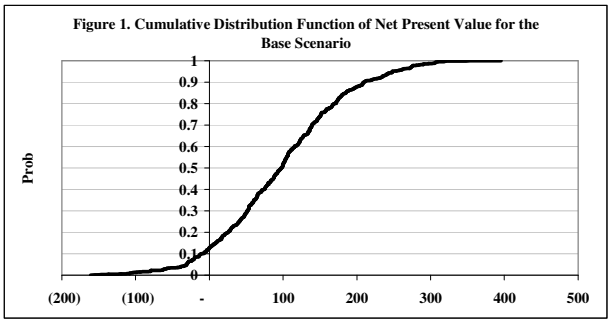
Figure 1. Cumulative Distribution Function of Net Present Value for the Base Scenario
Prob
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
(200)
(100)
-
100
200
300
400
500

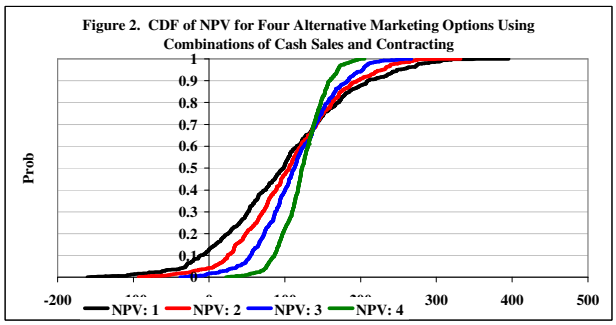
Figure 2. CDF of NPV for Four Alternative Marketing Options Using Combinations of Cash Sales and Contracting
Prob
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
-200
300
400
500
NPV: 1
NPV: 2
NPV: 3
NPV: 4

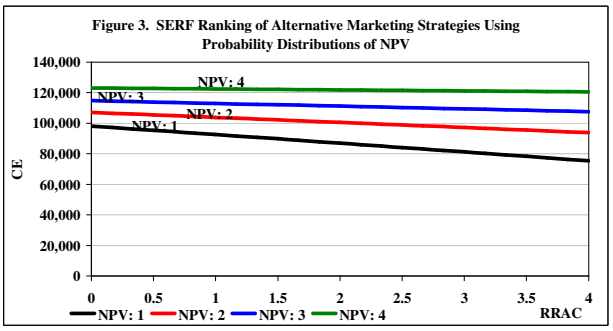
Figure 3. SERF Ranking of Alternative Marketing Strategies Using Probability Distributions of NPV
CE
140,000
120,000
100,000
80,000
60,000
40,000
20,000
0
NPV: 4
NPV: 3
NPV: 2
NPV: 1
0
0.5
1
1.5
2
2.5
3
3.5
4
RRAC
NPV: 1
NPV: 2
NPV: 3
NPV: 4

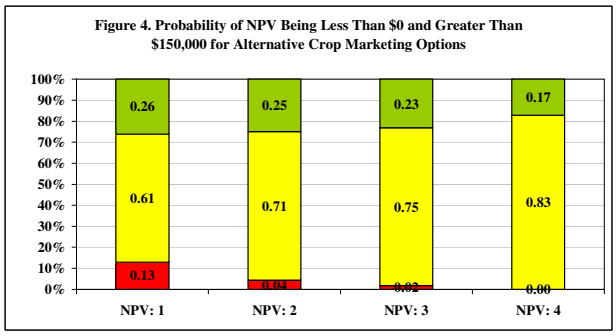
Figure 4. Probability of NPV Being Less Than $0 and Greater Than $150,000 for Alternative Crop Marketing Options
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0.26
0.61
0.13
0.25
0.71
0.03
0.23
0.75
0.02
0.17
0.83
0.00
NPV: 1
NPV: 2
NPV: 3
NPV: 4

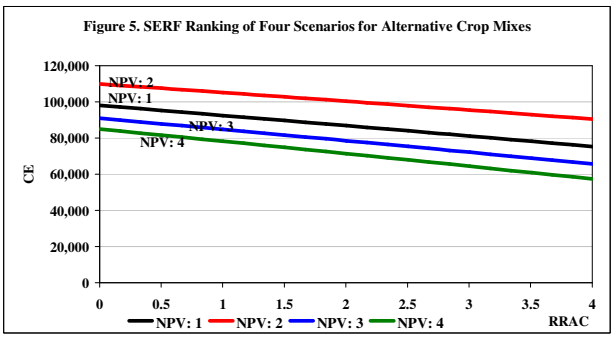
Figure 5. SERF Ranking of Four Scenarios for Alternative Crop Mixes
CE
120,000
100,000
80,000
60,000
40,000
20,000
0
NPV: 2
NPV: 1
NPV: 3
NPV: 4
0
0.5
1
1.5
2
2.5
3
3.5
4
RRAC
NPV: 1
NPV: 2
NPV: 3
NPV: 4

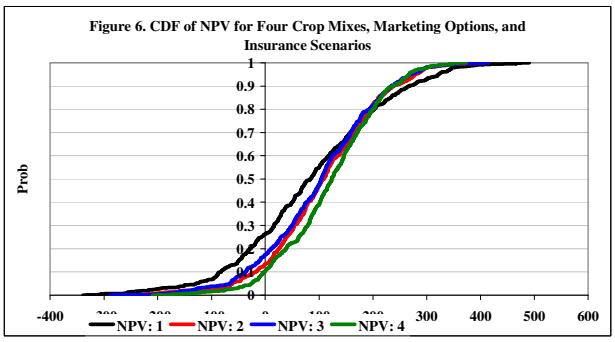
Figure 6. CDF of NPV for Four Crop Mixes, Marketing Options, and Insurance Scenarios
Prob
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0
-400
300
400
500
600
NPV: 1
NPV: 2
NPV: 3
NPV: 4

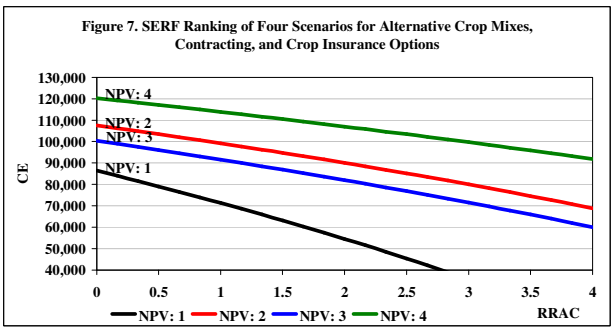
Figure 7. SERF Ranking of Four Scenarios for Alternative Crop Mixes, Contracting, and Crop Insurance Options
CE
130,000
120,000
110,000
100,000
90,000
80,000
70,000
60,000
50,000
40,000
NPV: 4
NPV: 2
NPV: 3
NPV: 1
0
0.5
1
1.5
2
2.5
3
3.5
4
RRAC
NPV: 1
NPV: 2
NPV: 3
NPV: 4

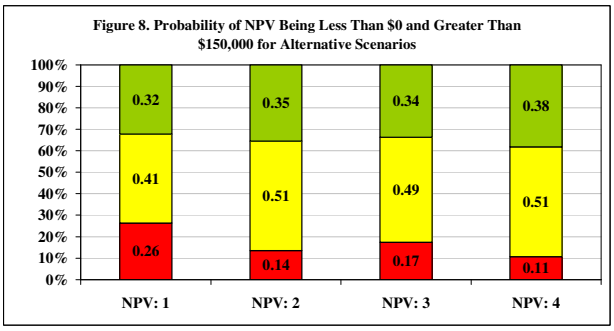
Figure 8. Probability of NPV Being Less Than $0 and Greater Than $150,000 for Alternative Scenarios
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
0.32
0.41
0.26
0.35
0.51
0.14
0.34
0.49
0.17
0.38
0.51
0.11
NPV: 1
NPV: 2
NPV: 3
NPV: 4

Summary and Conclusions

Risk management will continue to be a major challenge facing farm managers in the future. With the increased need to manage risk and the fact that risk management skills are learned, there is a growing need to train commercial farmers how to analyze and rank risky alternatives. Monte Carlo simulation models of the pro-form financial statements for a farm can be used to by farmers to evaluate risky alternatives. However, the decision tools available for ranking risky alternatives have long been an impediment to training farmers how to choose among risky alternatives once their alternatives have been simulated.

The objective of this paper was to demonstrate how new risk ranking tools available for Microsoft® Excel can be used to teach farmers how to rank risky alternatives. A new Excel add-in, Simetar, includes new and innovative risk ranking tools that are easy to use and interpret in the familiar environment of Excel spreadsheets. The steps for developing a Monte Carlo simulation model are demonstrated for a representative crop farm and StopLight charts and SERF risk ranking methods are demonstrated for alternative marketing, crop mixes and crop insurance strategies.

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Appendix: Printout of a Monte Carlo Simulation Model for a Representative Crop Farm.

	A	B	C	D	E	F	G	H	I
1	**Appendix Representative Grain Farm Simulation Model.xls**								
2	James W. Richardson © March 2007								
3									
4	**Manager's Input Data to Simulate a Hypothetical Farm are in Bold**								
5	First year to simulate	**2007**							
6	Hectares Owned	**97.2**							
7	Hectares Cash Rented	**449.4**							
8	Land & Building Value	**1,000,000**							
9	% Change Land Value	**5%**							
10	Beginning Cash Reserves	**65,000**							
11	Base Family Living	**40,000**							
12	Bonus Fam. Living % NCFI	**5%**							
13	Discount Rate for NPV	**0.125**							
14	Depreciation Tax Deduction	**25,000**							
15	Other Tax Deductions	**4,000**							
16	Local Interest Rate Basis	**0.05**							
17	Operating Loan % Year	**50%**							
18	Interest for Cash Reserves	**0.03**							
19	**Variable Production Costs per Hectare**								
20	Corn	**407.55**							
21	Soybean	**244.53**							
22	**Harvest Cost per Kg**								
23	Corn	**0.01516**							
24	Soybean	**0.01157**							
25	**Fixed Costs for the Whole Farm**								
26	Cash Rent for Land	**142,500**							
27	Fixed Cost	**63,360**							
28	**Producer's Average Yields**	2007	2008	2009	2010	2011			
29	Corn Yield	**9724.9**	**10038.6**	**10164.1**	**10289.6**	**10415.1**			
30	Soybean Yield	**3325.3**	**3513.5**	**3576.3**	**3639.0**	**3701.8**			
31	**Price Basis between Local and National Prices**								
32	Corn	**-0.00591**							
33	Soybean	**-0.00394**							
34	**Land Loan Information**								
35	Amount Borrowed	**500,000**							
36	Interest Rate	**0.075**							
37	Number of Years	**20**							
38	First Year of Loan	**2004**							
39	**Crop Insurance Assumptions**								
40		APH Yield Kg	Price Guarantee $/Kg						
41	Corn	**3683.21**	**0.1181**						
42	Soybean	**1270.07**	**0.2362**						
43									
44	**Define the Base and Alternative Scenarios to Analyze**								
45	**Fraction of Crop to Contract for a Fixed Price**					**Base and Alternative Scenarios for % of Crop Contracted**			
46		Contract Price	Fraction Contracted			Base Mktg.	Contract 1	Contract 2	Contract 3
47	Corn	**0.1260**	0.00	=SCENARIO(F47:I47)		**0%**	**25%**	**50%**	**100%**
48	Soybeans	**0.2520**	0.00	=SCENARIO(F48:I48)		**0%**	**25%**	**50%**	**100%**
49						**Base and Alternative Crop Mixes Under Consideration (ha)**			
50	**Crop Mix to Analyze**	Current Crop Mix				Base Crop Mix	Crop Mix 1	Crop Mix 2	Crop Mix 3
51	Corn Hectares		273.28	=SCENARIO(F51:I51)		**273.3**	**182.2**	**323.9**	**364.4**
52	Soybean Hectares		273.28	=SCENARIO(F52:I52)		**273.3**	**364.4**	**222.7**	**182.2**
53						546.56	546.56	546.56	546.56
54	**Crop Insurance Yield Coverage Fractions and Premiums**					**Base and Alternative Crop Insurance Scenarios**			
55			Current Crop Insurance Coverage			Base Insurance	Insurance 1	Insurance 2	Insurance 3
56	Corn Yield Coverage %		0.00	=SCENARIO(F56:I56)		**0**	**0.75**	**0.70**	**0.65**
57	SB Yield Coverage %		0.00	=SCENARIO(F57:I57)		**0**	**0.75**	**0.70**	**0.65**
58	Corn Premium $/Hectar		0.00	=SCENARIO(F58:I58)		**0.0000**	**1.0121**	**0.9109**	**0.6073**
59	Soybean Premium $/Hectar		0.00	=SCENARIO(F59:I59)		**0.0000**	**0.4858**	**0.4453**	**0.3239**
60									
61	**Projected Season Average Annual Prices, Rates of Inflation and Interest Rates from FAPRI, University of Missouri-Columbia**								
62		2007	2008	2009	2010	2011			
63	Corn Prices	**0.1274**	**0.1277**	**0.1278**	**0.1269**	**0.1256**			
64	Soybean Prices	**0.2631**	**0.2765**	**0.2762**	**0.2717**	**0.2687**			
65	Price Paid Index	**0.047**	**0.020**	**0.014**	**0.012**	**0.014**			
66	Consumer Price Index	**206.049**	**210.181**	**213.947**	**217.706**	**221.709**			
67	Prime Interest Rate	**0.048**	**0.051**	**0.054**	**0.056**	**0.057**			
68									

Appendix: Continued

	A	B	C	D	E	F	G	H	I
69	**Historical National Season Average Prices and Producer's Actual Yield History**								
70		Corn Price	SB Price	Corn Yield	SB Yield				
71	1995	**0.128**	**0.265**	**4089.6**	**1270.1**				
72	1996	**0.107**	**0.289**	**3200.6**	**1066.9**				
73	1997	**0.096**	**0.255**	**3226.0**	**1117.7**				
74	1998	**0.076**	**0.194**	**3556.2**	**1371.7**				
75	1999	**0.072**	**0.182**	**2489.3**	**533.4**				
76	2000	**0.073**	**0.179**	**4927.9**	**1524.1**				
77	2001	**0.078**	**0.172**	**3124.4**	**1371.7**				
78	2002	**0.091**	**0.218**	**4496.1**	**1295.5**				
79	2003	**0.095**	**0.289**	**3403.8**	**1193.9**				
80	2004	**0.076**	**0.203**	**2387.7**	**1295.5**				
81	2005	**0.079**	**0.223**	**4877.1**	**1422.5**				
82	2006	**0.125**	**0.240**	**4445.3**	**1219.3**				
83									
84	**Calculate Summary Statistics for the Random Variables**								
85		Corn Price	SB Price	Corn Yield	SB Yield				
86	**Mean**	0.091	0.226	3685.325	1223.502				
87	**StDev**	0.020	0.042	870.378	252.121				
88	**Min**	0.072	0.172	2387.735	533.430				
89	**Max**	0.128	0.289	4927.878	1524.086				
90									
91	**Test for Presence of a Trend**								
92		Corn Price	SB Price	Corn Yield	SB Yield				
93	**Intercept**	1.954928798	4.810808419	-112337.6318	-34667.2131				
94	**Slope**	-0.000931655	-0.002291966	57.99697898	17.94087252				
95	**R-Square**	0.029292377	0.039289236	0.057721648	0.065828051				
96	**S.E.**	0.001695986	0.003583998	74.10126399	21.37231044				
97	**T-Test**	-0.549329709	-0.639499874	0.782671926	0.83944469				
98	**Prob(T)**	0.593755524	0.535588735	0.45034093	0.419089949				
99									
100	**Calculate a Correlation Matrix for the Random Variables and test for Statistical Significance to Determine if Need a MV Distribution**								
101		Corn Price	SB Price	Corn Yield	SB Yield				
102	**Corn Prices**	1	**0.73**	0.24	-0.02				
103	**Soybean Price**		1	0.03	-0.11				
104	**Corn Yield**			1	**0.60**				
105	**Soybean Yield**				1				
106	**Correlation Coefficient t-values. Bold values indicate statistical significance at the specified level.**								
107	**Significance**	95%		t-critical	2.23				
108		Corn Price	SB Price	Corn Yield	SB Yield				
109	**Corn Price**		**3.36**	0.78	0.08				
110	**SB Price**			0.09	0.35				
111	**Corn Yield**				**2.37**				
112									
113	**Simulate Five Years of Stochastic Prices and Yields using a Multivariate Empirical (MVE) Distribution**								
114	**Assemble the Projected Mean Prices and Assumed Average Annual Yields**								
115		**2007**	**2008**	**2009**	**2010**	**2011**			
116	**Corn Prices $/kg**	0.1274	0.1277	0.1278	0.1269	0.1256	=F63		
117	**Soybean Price $/kg**	0.2631	0.2765	0.2762	0.2717	0.2687	=F64		
118	**Corn Yield kg/ha**	9724.939	10038.646	10164.130	10289.613	10415.096	=F29		
119	**Soybean Yield kg/ha**	3325.302	3513.526	3576.268	3639.009	3701.751	=F30		
120									
121	**Simulate the MVE Stochastic Values for the Random Variables as Fractional Deviations from Trend in One Step**								
122		**2007**	**2008**	**2009**	**2010**	**2011**			
123	**Corn Prices $/kg**	0.1315	0.1292	0.1098	0.1740	0.1113	=MVEMP($B$71:$E$82,,,,F116:F119,1)		
124	**Soybean Price $/kg**	0.2814	0.2920	0.2194	0.2672	0.2943			
125	**Corn Yield kg/ha**	8356.69	8519.84	8318.91	11525.87	8106.64			
126	**Soybean Yield kg/ha**	3779.53	3720.20	3259.73	4298.68	3395.17			
127									
128									
129	**Calculations for the Financial Part of the Farm Model Begin Here**								
130	**Stochastic Production (kg) = Stochastic Yield * Planted Area**								
131	Corn	2,283,710	2,328,297	2,273,386	3,149,782	2,215,377	=F125*$C$51		
132	Soybean	1,032,867	1,016,655	890,818	1,174,740	927,829	=F126*$C$52		
133	**Localized Stochastic Market Prices = Stochastic Price plus the Local Price Wedge**								
134	Corn	0.1256	0.1233	0.1039	0.1680	0.1054	=$B$32+F123		
135	Soybeans	0.2775	0.2881	0.2155	0.2632	0.2904	=$B$33+F124		

Appendix: Continued

	A	B	C	D	E	F	G	H	I
136	**Localized Contract Prices Specified for the Marketing Scenarios**								
137	Corn	0.1260	0.1260	0.1260	0.1260	0.13	=$B$47		
138	Soybeans	0.2520	0.2520	0.2520	0.2520	0.25	=$B$48		
139	**Calculate Market Receipts = Wted. Average of Stochastic and Contract Prices * Stochastic Production**								
140	Corn	286,831	286,966	236,186	529,305	233,486	=F131*($C$47*F137+(1-$C$47)*F134)		
141	Soybeans	286,628	292,902	191,927	309,213	269,406	=F132*($C$48*F138+(1-$C$48)*F135)		
142	**Crop Insurance Assumptions for this Scenario**								
143		APH Yield	Yld Fraction	Insured Yld	Prem/Acre	Guaranteed Price			
144	Corn	3,683	0	-	0.00	0.12			
145	Soybeans	1,270	0	-	0.00	0.24			
146	**Calculate Crop Insurance Indemnity = IF(Stochastic Yield < Insured Yield, then Lost Yield * Guaranteed Price)**								
147	Corn Stoch Yield	8,356.69	8,519.84	8,318.91	11,525.87	8,106.64	=F125		
148	Corn Insured Yield	-	-	-	-	-	=$D$144		
149	Corn Lost Yield	-	-	-	-	-	=IF(F147<F148,F148-F147,0)		
150	Corn Indemnity	-	-	-	-	-	=F149*$F$144*$C$51		
151	SB Stoch Yield	3,779.53	3,720.20	3,259.73	4,298.68	3,395.17	=F126		
152	SB Insured Yield	-	-	-	-	-	=$D$145		
153	SB Lost Yield	-	-	-	-	-	=IF(F151<F152,F152-F151,0)		
154	SB Indemnity	-	-	-	-	-	=F153*$F$145*$C$52		
155	**Minimum Annual Family Withdrawals = Base Value for 2007 Inflated by Annual Percentage Change in CPI**								
156	Family Withdrawals	40,000	40,802	41,533	42,263	43,040	=E156*(1+(F66-E66)/E66)		
157	**Costs of Production = Base Cost in 2007 Inflated by Percentage Change in Prices Paid Index**								
158	**VC per Hectare**	Estimate '07	Inflated '08	Inflated '09	Inflated '10	Inflated '11	Inflated '11		
159	Corn inflated by PPI	407.55	426.70	435.37	441.33	446.41	=E159*(1+E$65)		
160	SB inflated by PPI	244.53	256.02	261.22	264.80	267.84	=E160*(1+E$65)		
161	**Harvest Cost per Kg**								
162	Corn inflated by PPI	0.02	0.02	0.02	0.02	0.02	=E162*(1+E$65)		
163	SB inflated by PPI	0.01	0.01	0.01	0.01	0.01	=E163*(1+E$65)		
164	**Fixed Costs for the Whole Farm**								
165	Land rent inflate by CPI	142,500	145,357	147,962	150,562	153,330	=E165*(1+(F66-E66)/E66)		
166	Fixed cost inflate by PPI	63,360	66,338	67,685	68,612	69,401	=E166*(1+E$65)		
167									
168									
169	**Financial Statements**								
170									
171	**Income Statement**	**2007**	**2008**	**2009**	**2010**	**2011**	Formula in Col. F		
172	Receipts								
173	Corn Mkt Receipts	286,831	286,966	236,186	529,305	233,486	=F140		
174	SB Mkt Receipts	286,628	292,902	191,927	309,213	269,406	=F141		
175	Corn Indemnity	-	-	-	-	-	=F150		
176	SB Indemnity	-	-	-	-	-	=F154		
177	Total Receipts	573,459	579,868	428,113	838,517	502,892	=SUM(F173:F176)		
178	Expenses								
179	Corn Variable Cost	111,375	116,610	118,977	120,607	121,994	=$C$51*F159		
180	SB Variable Cost	66,825	69,966	71,386	72,364	73,196	=$C$52*F160		
181	Corn Harvest Cost	34,613	36,948	36,809	51,697	36,779	=$C$51*F125*F162		
182	SB Harvest Cost	11,955	12,320	11,014	14,724	11,763	=$C$52*F126*F163		
183	Crop Insurance Prem	-	-	-	-	-	=$C$51*$E$144+$C$52*$E$145		
184	Land Rent	142,500	145,357	147,962	150,562	153,330	=F165		
185	Fixed Costs	63,360	66,338	67,685	68,612	69,401	=F166		
186	Operating Interest	21,036	22,489	23,690	25,268	24,839	=SUM(F179:F185)*(F67+$B$16)*$B$17		
187	Land Debt Interest	34,702	33,627	32,470	31,227	29,891	=G309		
188	Carryover Debt Interest	-	-	-	4,179	-	=(F67+$B$16)*E210		
189	Total Expense	486,366	503,654	509,993	539,239	521,193	=SUM(F179:F188)		
190	**Net Cash Farm Income**	87,092	76,214	(81,880)	299,278	(18,301)	=F177-F189		
191	**Cash Flow Statement**								
192	Beginning Cash Jan 1	65,000	85,821	97,495	-	96,004	=E205		
193	Net Cash Income	87,092	76,214	(81,880)	299,278	(18,301)	=F190		
194	Interest Earned	1,950	2,575	2,925	-	2,880	=$B$18*F192		
195	Cash Inflows	154,042	164,610	18,540	299,278	80,584	=SUM(F192:F194)		
196									
197	Land Debt Payments	14,344	15,419	16,576	17,819	19,156	=G310		
198	Repay Deficit Loans	-	-	-	39,569	-	=E210		
199	Family Living	40,000	40,802	41,533	42,263	43,040	=F156		
200	Family Living Bonus	4,355	3,811	-	14,964	-	=IF(F190>0,F190*$B$12,0)		
201	Income Taxes	9,523	7,082	-	88,658	-	=F341		
202	Cash Outflows	68,221	67,114	58,109	203,274	62,196	=SUM(F197:F201)		
203	**Ending Cash Dec 31**	85,821	97,495	(39,569)	96,004	18,388	=F195-F202		

Appendix: Continued

	A	B	C	D	E	F	G	H	I
204	**Balance Sheet**								
205	Cash Dec 31st	85,821	97,495	-	96,004	18,388	=IF(F203>0,F203,0)		
206	Land Dec 31st	1,050,000	1,102,500	1,157,625	1,215,506	1,276,282	=E206*(1+$B$9)		
207	Total Assets	1,135,821	1,199,995	1,157,625	1,311,511	1,294,670	=SUM(F205:F206)		
208									
209	Land Debt	448,355	432,936	416,360	398,541	379,385	=G308		
210	Cash Flow Deficits	-	-	39,569	-	-	=IF(F203<0,-F203,0)		
211	Total Liabilities	448,355	432,936	455,929	398,541	379,385	=SUM(F209:F210)		
212	**Net Worth**	687,466	767,059	701,696	912,970	915,285	=F207-F211		
213									
214	**Financial Ratios and Key Output Variables**						Formula in Col. F		
215	**Net Present Value**								
216	Discount Factors	0.89	0.79	0.70	0.62	0.55	=1/((1+$B$13)^5)		
217	Beginning Net Worth	602,301							
218	PV Family Withdrawals	39,426	35,250	29,170	35,726	23,884	=F216*(F199+F200)		
219	**PV Ending Net Worth**					507,918	=F216*F212		
220	**Counter for Real Increase in Net Worth**					-	=IF(F219>B217,1,0)		
221									
222	**Rate of Return on Investment**								
223	**Net Returns**	62,092	51,214	(106,880)	274,278	(43,301)	=F190-F317		
224	**Interest Costs**	55,739	56,115	56,160	60,674	54,730	=SUM(F186:F188)		
225	**Annual ROI**	19.56%	17.82%	-8.42%	55.61%	1.90%	=(F223+F224)/$B$217		
226									
227	**Probability of Cash Flow Deficits for 1 year and for 2 Consecutive Years**								
228	**P(EC<0 one year)**	0	0	1	0	0	=IF(F203<0,1,0)		
229	**P(EC<0 two years)**		0	0	0	0	=IF(E228+F228=2,1,0)		
230	**KOV Table**								
231	**NPV**	69,074	=-B217+SUM(B218:F219)						
232	**Avg ROI**	0.173	=AVERAGE(B225:F225)						
233	**PVENW**	507,918	=F219						
234	**NCFI 1**	87,092	=TRANS(B190:F190)						
235	**NCFI 2**	76,214	=TRANS(B190:F190)						
236	**NCFI 3**	(81,880)	=TRANS(B190:F190)						
237	**NCFI 4**	299,278	=TRANS(B190:F190)						
238	**NCFI 5**	(18,301)	=TRANS(B190:F190)						
239	**EC 1**	85,821	=TRANS(B203:F203)						
240	**EC 2**	97,495	=TRANS(B203:F203)						
241	**EC 3**	(39,569)	=TRANS(B203:F203)						
242	**EC 4**	96,004	=TRANS(B203:F203)						
243	**EC 5**	18,388	=TRANS(B203:F203)						
244	**ROI 1**	0.20	=TRANS(B225:F225)						
245	**ROI 2**	0.18	=TRANS(B225:F225)						
246	**ROI 3**	(0.08)	=TRANS(B225:F225)						
247	**ROI 4**	0.56	=TRANS(B225:F225)						
248	**ROI 5**	0.02	=TRANS(B225:F225)						
249	**P(EC<0) Yr 1**	-	=TRANS(B228:F228)						
250	**P(EC<0) Yr 2**	-	=TRANS(B228:F228)						
251	**P(EC<0) Yr 3**	1.00	=TRANS(B228:F228)						
252	**P(EC<0) Yr 4**	-	=TRANS(B228:F228)						
253	**P(EC<0) Yr 5**	-	=TRANS(B228:F228)						
254	**P(EC<0 2 Yrs) Yr 2**	-	=TRANS(C229:F229)						
255	**P(EC<0 2 Yrs) Yr 3**	-	=TRANS(C229:F229)						
256	**P(EC<0 2 Yrs) Yr 4**	-	=TRANS(C229:F229)						
257	**P(EC<0 2 Yrs) Yr 5**	-	=TRANS(C229:F229)						

EVALUATING THE EFFECTIVENESS OF FARM FINANCIAL MANAGEMENT TRAINING

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Abstract

The summer of 2006 was devoted to conducting an in-depth, follow-up survey of all Farm Service Agency (FSA) Borrower Training Workshop participants. FSA Borrower Training Workshops began in February 1995 and have involved 1,004 farms and 1,500 individuals. This paper will share survey results concerning long-term workshop effectiveness. Survey results indicate participants got meaningful, useful, and profitable education from the workshops. Further, the paper will relate the effectiveness of different farm management education teaching concepts and tools used during the workshops. Evaluations conducted at the end of each workshop suggest our efforts have been successful. Participants rated the materials, instructors, and the whole educational experience as being worthwhile. Ninety-seven percent indicated they would recommend the training to other farmers. The follow-up survey was conducted to determine if the farm financial management training had lasting value to participants.

Key Words: *Evaluation, Financial, Farm, Management, Training, Effectiveness*

Introduction

In 1994, the United States Congress passed laws requiring Farm Service Agency (our lender of last resort) borrowers to participate in farm financial management training. The characteristics of this training program were considerably different from the traditional educational activities in which Extension Farm Management Specialists had been involved. First, Federal law required borrowers to participate. Secondly, the training was going to be expensive relative to the normally free Extension educational programs. Lastly, the rules required participant's efforts to be graded which had never been part of our educational programs. These characteristics made participants extremely unhappy.

University of Kentucky Farm Management Specialists designed, and developed a set of training materials specifically for this training program. Since our first training workshop in February 1995, we have conducted 82 workshops involving 1,004 farms and more than 1, 500 people. The program is ongoing.

Participant Knowledge of and Experience with Farm Financial Management

A standard part of our FSA Borrower Training Workshops has been a Financial Management Survey. The survey is conducted at the beginning of the workshop. The purpose of the survey is to obtain a better understanding of participants, the size and type of farms represented, and to establish a "***baseline***" concerning their knowledge of farm financial management.

Results of the baseline survey indicate that participants do very little tracking of income and expenses. Some three-quarters of participants used their checkbook to record transactions, while another 26% file their expenses into separate files. Fewer than 40% of participants used a system (computer, record book, or professional book keeping service) to assist in performing periodic analysis of income and expenses.

Questions about taxes also indicated a severe lack of knowledge. Only 31% of participants reported filling out a Schedule F (our Internal Revenue Service (IRS) Form on which farm income and expenses are reported). Participants indicate that tax preparers and accountants prepare their income tax returns; however, it became abundantly clear there was a lack of understanding of what a Schedule F really is.

Participant Reactions to the FSA Borrower Training Workshops

Another standard part of these educational efforts has been an Exit Evaluation. The evaluation is the last thing participants do at a workshop. It is an anonymous evaluation each participant is strongly encouraged to complete. Determining which of our efforts were successful and which need to be changed or eliminated is the objective.

The workshop included a number of management tools or concepts we wanted to impart to participants including goal setting, farm management decision making, risk management, information gathering, record keeping, enterprise budgeting, balance sheets, income statements and financial analysis. According to the Exit Evaluation, the general reaction of participants to the workshops was quite positive.

The Exit Evaluation indicated the most important things the students learned were record keeping, goal setting, and the role of the farm business manager. These were followed in importance by the income statement, managing risk, and the general role of information. Surprisingly, enterprise budgeting and balance sheets were judged unimportant by participants.

Workshop participants had many nice comments about the handout materials used during the workshop and the quality of the overheads. However, the most gratifying finding of the Exit Evaluation was the response to the question: "Would you recommend this workshop to another farmer?" Ninety-seven percent of participant respondents indicated they would recommend the workshop to another farmer.

Have the FSA Workshops Helped Our Producers?

The results of the Exit Evaluation were surprisingly satisfying. Given where the clientele group was at the start of the workshops we felt we had experienced a successful Extension educational effort; but, we wanted to do a "follow-up survey." We wanted to know if participants had retained anything we taught them during the workshops.

General Parameters of the Follow-Up Survey

We felt the design of the survey questionnaire was critical to its success. Our desire was to have a short, simple questionnaire which would encourage participants to respond. The decision was made to limit the questionnaire to two pages with simple "yes-and-no" questions or rankings that respondents could easily check. The final survey instrument was contained on one page, front and back, including 28 questions. (*Please contact the authors directly to obtain a copy of the survey questionnaire*.)

Between February of 1995 and March of 2006, we conducted 78 FSA Workshops. These workshops have involved 969 registering farms with 1,488 people (spouses, relatives, and significant others were encouraged to attend) participating. The objective of the follow-up survey was to contact every farm that had registered for a workshop and give them the opportunity to respond.

During July of 2006, the follow-up survey questionnaire was mailed to the 969 participants. This original mailing of the survey instrument was followed by a "reminder post card" ten days after the original mailing. We suffered the normal problems with mail surveys concerning bad addresses, deceased borrower-participants, and borrower-participants that had left Agriculture and those who did not feel comfortable responding to the survey. After these problems and difficulties, 823 participants should have received the questionnaire and responded.

Our initial response rate was quite low. We were disappointed more folks had not responded. To overcome this we decided to attempt to call all participants for which we had a telephone number. (*Note: We did not have telephone numbers for all participants. A large number of telephone numbers had been lost from our database.*) The purpose of the call was to encourage participants to send the survey questionnaire back so their response could be included in the final analysis. This phone follow-up campaign seemed to help the response rate.

Survey Response Rate

We received 235 useable responses from the 823 potential respondents. This was a response rate of 29%. The response rate may seem low; however, we were pleasantly surprised by the result. Our expectations when we sent the survey were a 20% response rate, so the 29% rate was quite acceptable. Particularly since this clientele group was forced to participate in this expensive workshop they did not want to attend.

Results of the FSA Borrower Workshop Follow-Up Survey

General Characteristics of Workshop Participants

We were fortunate to receive responses from participants in every year the workshops have been conducted. As expected the largest percentage response was from 2005, which made up 23% of the total. The lowest response was for 2004 with only 4% of the total. Six percent of responses were from 1995 participants which was rather surprising.

Most of the farms were rather small in terms of acreage farmed. Thirty -three percent of participants had farms containing 101-250 acres. Only 7% of participants were farming more that 1,000 acres.

The enterprises represented were quite typical of Kentucky Agriculture. The most common enterprise was beef production, with 70% of participants. Typically, the business was a cow-calf operation with some backgrounding of stockers, but very little beef finishing. In conjunction with the beef enterprise, 59% of participants indicated they also had a hay enterprise

Many farms that produced beef also produced tobacco, which has been a traditional enterprise combination in Kentucky. Fifty percent of participants indicated that they produced tobacco on their farm. Other traditional enterprises of corn, soybeans, and wheat were produced by 33%, 26%, and 20% of participants, respectively. The dairy enterprise was part of 14% of participant's farms while hogs, poultry, and fruits and vegetables were produced equally by 4% of participants.

Management Tools and Concepts Used by Workshop Participants

Goals and Goal Setting

As mentioned earlier, a number of farm business management tools and concepts were taught during the workshops. One of the main objectives of the follow-up survey was to determine if participants learned about these concepts and tools, took them home and used them.

The first concept taught in every workshop was goals and goal setting. Many of the participants indicated that they used goals prior to the workshop. However, they had not made goal setting and writing them down a formal part of the management of their farm business. Eighty-five percent of those responding to the survey indicated they made goals and goal setting part of their farm business management. Those who did not use goals or goal setting in the management of their farm business made up 15% of respondents. These results indicate workshop participants accepted the goals and goal-setting concept as part of the management of their farm business. Apparently, they found the concept to be useful in improving the management of their farm business.

Record Keeping

The greatest amount of workshop time was devoted to record keeping. While some 40% of participants indicated they used some type of record keeping in the initial survey administered at the beginning of the workshop, it became clear many of these were rather "informal" record keeping systems. Participants needed more instruction in the use of this management tool. `

Ninety-seven percent of those responding to the follow-up survey indicated they used some type of farm record keeping. Only 3% indicated they did not use record keeping as part of the management of their farm business. Record books were used by 65% of those keeping records. Twenty-eight percent of those keeping records indicated they were using a computer while 9% indicated they were using professional consultants.

As a follow-up to the use of record keeping respondents were asked if they thought record keeping had improved their financial decision making. Eighty-seven percent of those keeping records indicated that record keeping had improved their financial decision making. Thirteen percent of those keeping records did not feel the record keeping had improved their farm management financial decision making.

Extended discussions of income taxes were often part of the record keeping workshop exercises. This often included a reference to tax-deductible items that were not used by participants because of fear of the IRS. Discussions attempted to convince participants they should claim these deductions. It was also discovered students were often getting bad advice from their income tax preparers. Again, time was devoted to trying to impress on participants the need to use tax advisors that were more knowledgeable.

To investigate this knowledge of income taxes the survey questionnaire asked participants if they had changed tax return preparers. Only 19% of respondents indicated they had changed tax preparers. However, 66% of respondents indicated that they regularly reviewed their income tax return while 34% indicated they did not review their return. This appears to be an area in which the workshop education was not successful; however, it should be recalled that only 31% of participants indicated they completed a Schedule F (our IRS Form on which farm income and expenses are reported) in our baseline survey at

the beginning of the workshop. Participation in the workshops had more than doubled the number of students that were "*at least looking*" at the income tax return prepared by their tax advisor.

Enterprise Budgets

Another tool taught as part of the workshops was the enterprise budget. It is a standard management tool we expected to be easily understood, adopted, and used by participants. During the workshops, the discussions seemed to go quite smoothly and very few problems were encountered.

Only 36% of participants indicated they had used an enterprise budget to help justify the reduction in size or complete elimination of an enterprise from their farm business. Sixty-four percent indicated they had not used the enterprise budget for this purpose. Twenty-eight percent of respondents indicated they had used an enterprise budget to expand an existing or start a new enterprise. Seventy-two percent of respondents indicated they had not used a budget for this purpose.

Balance Sheets

One of the financial statements covered during the workshops was the balance sheet. Students responded well to the presentation of the balance sheet and seemed to grasp the concept well. Eighty-four percent of respondents indicated they were better able to prepare a balance sheet after participation in the workshop. The remaining 16% did not feel the workshop had improved their ability to prepare a balance sheet.

We also asked if participants used the balance sheet to measure financial progress. Seventy percent of respondents indicated they used the balance sheet to measure financial progress. Thirty percent of respondents indicated they did not use the balance sheet to measure financial progress.

Income

A second financial statement covered during the workshop was the income statement. The students were receptive to this financial statement; however, we felt we encountered more difficulties teaching and explaining the accrual adjusted income statement used for the workshop. The instructors were not as comfortable teaching this statement and made many adjustments in their approach to and treatment of it.

The instructor's level of comfort teaching this statement was reflected in participants' use of it. Only 48% of respondents indicated they used workshop training to prepare an income statement. Fifty-two percent of respondents indicated that they did not use the training to prepare an income statement.

We also inquired whether the income statement was used to better determine the profitability of their farm business. Seventy-one percent of respondents indicated they used the income statement to measure the profitability of their farm business leaving 29% that did not use an income statement.

Participant's Valuation of the FSA Borrower Workshop

In addition to trying to determine participants' adoption and use of the various tools and concepts taught during the workshop, we were also interested in the extent to which the tools had improved their farms' profitability.

Fifty-seven percent of students thought the workshops had helped them improve their farm's profitability. The remaining 43% did not feel that profitability had improved. For those farms improving profitability, the increase ranged from a low of 2% to a high of 75%. The average improvement for all farms was 18%.

We also asked participants about the benefits derived from the workshop relative to its costs. Seventy-five percent of respondents believed their farm management skills had improved enough to cover the costs of the workshop. Twenty-five percent did not think their skills had improved enough to offset workshop costs.

We also inquired about increases in annual farm income. Participants responded that their annual farm incomes had increased as indicated in Table 1.

Table 1: Increase in Annual Farm Income Resulting from Workshop Participation

Range of Increase	Percent of Respondents
More than $2,500	18%
$1,001 - $2,500	18%
$501 - $1,000	19%
0 - $500	9%
No Change	36%

It is disappointing that 36% of participants did not think their farm income had increased. Nevertheless, it was encouraging that 64% felt their annual farm income had increased. The fact that 18% of respondents thought their annual income had increased more that $2,500 was a surprisingly pleasant result.

Investigating the Effectiveness of Management Tools and Concepts

Further investigation of the survey data provided interesting insights into the apparent effectiveness of various management tools and concepts taught during the workshops. Table 2. presents a cross tabulation of participants' use of various management tools and concepts relative to the increased profitability of their farm business. This may not be a definitive judgment of the value of the tool or concept but it does offer some insights as to how useful it was with the education of this clientele group.

Table 2. Participants with More Profitable Farm Business Relative to Their Use of Management Tools and Concepts Taught During Workshop

	Percent of Respondents Increasing Profitability	
Tool or Concept	With Management Tool	Without Management Tool
Goals & Goal Setting	54%	3%
Record Keeping	56%	1%
Tax Return Review	44%	14%
Enterprise Budgets:		
To Start or Increase size	24%	38%
To Reduce or Eliminate	29%	36%
Balance Sheet	54%	3%
Income Statement	35%	21%

Table 2 indicates that record keeping, goals, and the balance sheets were used by more than fifty percent of the farm businesses that increased profits. Conversely, few participants (less than 3%) successfully increased the profitability of their farm business without the use of these tools. These results indicate that participants were successful in learning about these tools and concepts. They were also successful in taking them home and putting them into practice in their farm business.

The success achieved with the other tools and concepts was more questionable. This is not surprising concerning the subject of income taxes. Participants' lack of knowledge of income taxes and tremendous fear of the IRS are two obstacles that are extremely difficult to overcome.

The difficulties teaching the accrual adjusted income statement have been mentioned earlier. The results in Table 2 simply confirm the difficulties encountered with this financial statement during the workshops. The fact that 35% of participants found it useful in the management of their farm business is a surprisingly positive result. This should improve in the future as we continually strive to improve our instruction and explanation of this financial statement.

The largest and most disappointing surprise involved the enterprise budget. When this tool was incorporated into the workshop it was expected that participants would more readily understand, accept, and use this tool than many of the others covered. Further, there seemed to be a greater understanding of this tool than many others when it was taught. The fact that less than 30% of participants used enterprise budgets to help improve the profitability of their farm business was astounding! We expected much better adoption of this tool than is reflected in Table 2.

The results in Table 2 only scratch the surface of the type of information and insights that may eventually be gleaned from this evaluation survey. They do provide some information concerning the effectiveness of some of the management tools and concepts covered during the FSA Borrower Workshops. In particular, record keeping, goals, and balance sheets seemed to be well received. However, enterprise budgets proved to be a major disappointment!

Summary and Conclusions

The FSA Borrower Workshops educational program has been and continues to be successful and professionally rewarding. The workshop Exit Evaluation surveys indicated we have done a good job with the workshops. Most participants were pleased with the results.

The follow-up survey after folks had been away from the program for up to 12 years confirmed the training had lasting value to participants. The majority of respondents were able to increase both farm income and profitability as a result of workshop participation. Further, 87% of participants responding to the survey indicated they would recommend the workshop to other farmers.

Those educators typically working with larger farms involving experienced producers that are among the "brightest and the best in the industry" should remember this clientele group is from the other end of the spectrum. The marginal value of the education imparted to this group may be much greater that anything we can do with other groups.

FARM MANAGEMENT ADVISOR: REST THYSELF!! THE NEED FOR A WORKING VACATION

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Abstract

Too often farm advisors, either in the private or public sectors, follow the adage: "Do as I say, not, as I do". Farm advisors frequently become "members" of a client's family, and in doing so, may jeopardize what is near and dear, their own family. As with the cobbler, whose children having no shoes to wear, the farm advisor needs to focus on management issues of the home economy. For successful farm advisors, time is a precious commodity indeed; a working vacation with a spouse/partner can be a solution to accomplish buy-in for new business ideas and continued success in established enterprises. This paper discusses a frame work for a working holiday centred on a questionnaire to which they respond to one another either in oral or written means. The end product of such a working holiday is that spouses/partners have re-established mutual goals and reasons for pressing on.

Key Words: vacation, communication, analysis

Introduction

Time to regenerate is needed by all professionals. The recharging of personal batteries is necessary to keep professional focus and commitment to the farm advisory task or any professional undertaking. Jeremy Rifkin in his recent book, *The European Dream,* comments that cultures vary in their respective approaches to vacations and importantly in life perspectives. He states that the Europeans work to live, while those in the United States live to work. Successful farm advisors must balance the many and varied demands on their time, sometimes living to work from one crisis to the next with the potential to neglect what may be of most value, their families and themselves. Maria Shriver, presently first lady of California and author, captures the struggle for work-family balance, *"When we were spending time with our families we felt guilty for not going to work. When we got all caught up in our work we felt guilt about our kids. We found out super heroes had no peace of mind what so ever".*

The discussion that follows encourages farm advisors in the private and the public sectors to pause a moment and consider the undertaking of a "working vacation". During this vacation farm advisors practice upon themselves, spouses and partners what they preach to clientele. Breaking with the habit of "doing as I say, not as I do" is the focus of this exercise. The authors suggest the use of a series of questions and written exercises that enhance communication between spouses or partners.

Purpose and Preparation

The purpose of getting away from the normal routine of daily life is simply to disconnect from those routines. Thus, the idea of a working vacation almost sounds, by definition, like an oxymoron. However, the authors contend that farm advisors need to apply their skill set in an intentional manner for the purpose of reviewing their family economy in the context of utilizing a professional eye for the examination. Farm advisors work hard for their clients, however, an intentional critical eye to the "home front" is stepping away from the analogy of the cobbler whose children run about town without any shoes. Purposeful analysis of the home economy can provide useful information that may plug a hole in the dike thereby preventing a flood downstream. The analysis of the home economy entails looking at many aspects of home and family dynamics. A platform from which to work is often the missing key to open insights, potentially overlooked by very busy people. The authors have developed a set of questions from which to begin during this time away, in a neutral and relaxing location, where this analysis is undertaken. Because of increasing pressures within farm consultancy, consultants are looking for tools to work sharper not just harder or longer but more focused and balanced, for clients and self alike.

Maria Shriver continues, *"…the brass ring is balance, weighing and measuring your priorities to put together a life that fulfills you on your terms. Balance also means recalibrating your priorities when you need or want to"*. Attaining balance is easier said than done, hence, this encouragement for a working vacation.

As suggested above, spouses or partners (can be business partners) need to have opportunities to get away to restful environments. These environments are as varied and unique as are the individuals themselves. The point is to get away, from the everyday, to focus on this important task. Further, do so without children or dependants, if they are at home, allowing for focused and dedicated time to interact in the analysis process without distraction.

Whether it is planting or harvest time, working to half past dark generally rules agriculture and those who service it. In agriculture where timing decisions have such consequence, advisors are often pushing the limits of their own physical and psychological abilities in order to gain a little more daylight or opportunity for a client. Fatigue is the result or risk of repetitive action. As with a tractor, a fax machine

or a partner the use and misuse, without periodic maintenance and thorough examination (for the cause not the symptom), can transition through normal wear and tear to fatigue into failure. The business practice of a working vacation is used to define goals, refresh relationships, promote communication and in the long run restore productivity.

Like farming, many consultancies are built on the backs of families which must bear the strain of their advisor's apparent unending flexibility in responding to the demands of client farms. The consultant can face more quick turns in a day than the average rugby player in a match. Likewise the partners and families must do "the dance" to keep in step. Outcomes usually can be described as "Leftovers Again". The obvious picture drawn, therefore, is of a consultant arriving to a darkened sleeping house for the third night running. The light of the microwave outlines the tented plate from supper. If the advisor is lucky a note of instruction, from the partner, on reheating is included (for the food not the relationship!). But leftovers are also an apt description of what the partner and family receive when most available resources are drained emotionally and physically without time apart for recharge. The client may receive the first consideration of time and energy from the advisor while the partner must manage the home front, snatching a bit of time together on the weekends from the leftovers.

Stacy Colino cites a recently published study in which researchers at the University of Texas at Austin gave one partner from 86 dating couples a 3 day writing assignment. Each day, half of the subject group wrote down information of everyday life. The other half committed their deeper thoughts and feelings about their relationships to paper. Not all observations were positives. Three months after journaling 77 percent who wrote about their relationship were still going strong while only 52 percent of the everyday journalers were together. There is a common belief that conflict is destructive and to be avoided which tends toward suppressing anger and negative feelings instead of resolving anything. Walls are built. Colino further quotes study co-author James Pennebaker, PhD, professor and chair of psychology at University of Texas Austin, as saying; *"Standing back and writing about important issues can give you perspective and help focus on the central topics of importance. This process can lead to greater honesty, stability and intimacy in the relationship"*.

Methodology

Often it is said that perception is ninety percent reality. The use of a working vacation with a commitment to discovering new ideas, thoughts and needs between spouses/partners is helpful to long-term relationship success. The structure of a working vacation is basic to a successful outcome. The communication tool used is the writing of letters or essays between spouses/partners; followed by discussion of the writings. The questionnaire tool can be broken down into 3 main focal points. These points are: 1) the couple, spouses/partners; 2) the family; 3) the work/business interests of the couple. This necessitates three distinct and intentional periods of communication to address each point: for

example, three 4-hour time periods over a weekend, or three or more days away from competing agendas to give perspective and refreshment. Relaxing and refreshing activities are used as time space between the "work" of this vacation. These joint relaxing activities provide yet another venue for continuing the discussion of what is being learned about each other.

The activity during these periods is used to accomplish the art of communication. Jointly, but in separate places spouses/partners write and describe for the other responses to questions. These responses can be in the form of a love letter between spouses. If business partners are undertaking this exercise, an essay is a more appropriate format. Either way, the writers are separated physically, if possible, by using different rooms, patios or space. After a given period of time, say, one – two hours, the pair meets and exchanges letters or essays. These exchanged essays or letters are read twice, once for the heart and a second time for the head. Notes or questions for explanation may be made during this reading time. Again, after a time of contemplation regarding what was shared on paper, questions and discussion can follow to expand upon what was learned by the each spouse/partner. Hopefully, illumination is beginning to shine as new facets in the relationship are being revealed. This is ultimately the goal for this working vacation, as well as the formation of a new and constructive habit.

When planning the time for a working vacation a little homework goes a long way. Consider the place you will be. It is important to have privacy away from the paralyzing pressures of daily routine. You will also want to inquire as to the opportunities for fun together. This is not the weekend for hiring a deep sea fishing boat if only one of you likes to fish. However trying something new for both partners will draw them beyond their usual boundaries.

Be creative, Smile and Try to say YES! As a professional farm advisor you do this all the time. It is part of the work of this vacation.

Do not over commit! The purpose of this vacation is to begin a new habit, not to get it done. If you are able to identify areas where new goals are needed; you have been successful too.

A few things to leave home:

1. Cell phones, beepers, fax machines and laptops, and
2. Any client related business, this is your time with the board of directors of a very important company -- Your Family.

A few things to bring along:

1. Paper (lined and colored), pencils or pens, a calendar or agenda,
2. An open inquisitive mind,
3. A sense of humor and fun,
4. A listening heart, and,
5. A good bottle of merlot is a plus too!

A suggested construct of a questionnaire tool is provided. Obviously, questions can be added or deleted as needed or tailored to the circumstances.

Summary

The lead author, as a farm advisor, is finding, relative to: family business planning, succession, business growth, and general family/business issues, it's the "soft people" side that needs the most attention. Conversations with colleagues, brings general agreement that the finance/production side used to be 90% of our advising focus and 20% people/family/relationships...now it's flipped; we are spending nearly 80% of our time in workshops and conferences addressing people issues, team building, etc. The income and technical issues of operations are important, but often once the "people" needs are met, the remaining questions with responses fall into place.

With a good communicating management team in place, issues of family, finance (business and personal) and production come to a workable solution, not to say it's easy...but a balancing act...one that I've watched professional farm advisors (author included) dance a time or two. The fundamental point is to communicate clearly and effectively in order to accomplish the goals set forth by those to whom it matters most. Use of letter writing, as suggested here, can facilitate that communication.

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Appendix

Questionnaire tool for use during a working vacation

Okay: Here's the working vacation's TO DO LIST.

Couple Focus

1. How are you, as a couple, a marriage team, as partners...a unit of one?
2. What are your unique individual goals?
    i. Personal
    ii. Family
    iii. Business
3. Where are you pulling together...knowingly?....unknowingly?
4. What are some differences?

Family Focus

1. Review the status of your family:
2. Where you are as a family unit...the times are changing with young adult children
3. How are the wee ones?
4. Are the children meeting your expectations?
5. Are your expectations reasonable?
6. Are they meeting theirs?
7. What resources are going to be needed to be available to meet the children's needs in the next 5 years, 10 years?
8. Do the older children have any articulated goals...what can you do to encourage...not necessarily provide, to accomplish the goal?
9. Anything on your list.

Review of Business Interests or Holdings

1. Review current status of all business interests
    Consultancy business
    Farming business, if any
    Real estate holdings
    Other businesses

2. 5, 10, and 15 year projections for holdings, expansion of some, liquidation of others...general long-run views

3. Review estate plans of each...do you have plans in place for a "what if"?

4. Succession...if that is in the works...plans are they laid out, at what trigger points do things happen? Are the people and people skills in place for the succession to be a success...the production factors will follow...given "normal" operation constraints: finance, weather, risk, and markets?

This tool focuses on the written word. The authors believe that written communication is more intentional and thereby conveys a fuller message; perhaps intimate is a better word when used by couples. The task is to write letters, spouse/partner to spouse/partner or business partner to business partner to communicate core beliefs on varied topics relating to relationship within the context of family or businesses and the topics of review from the list above.

But first the rules:

1) Go to separate rooms or space and write the letter,

2) After a time, come back together, exchange the letters and read them, TWICE, once for the heart, and a second time for the head.

3) Then spend time discussing what you've learned about each other.

Below are suggested questions for spouses/partners. These letters or essays may include more personalized comments or thoughts related to the review of issues above.

A) _____ attracts me to you, even after ____ years of marriage and motivates me to redouble my efforts to meet your needs.

B) I envisage that the next 5 years will be _____; in 15 years I hope you and I will have enjoyed the success of _____.

C) If there was one thing that I could change about myself, to make me a better husband/wife, business person, friend/confidant, support for you...it would be _____.

D) When I look back at our combined efforts I am most happy about _____; therefore, as a springboard, I look forward to _____.

E) Rating our relationship, I rank it between 1 and 5, with 5 being most excellent, and this is why.

F) One of the most challenging issues I face(d) in our relationship is _____, and this is how I deal with it.

G) The celebration or tradition we have in our family I cherish the most is _____ because….

H) Some of your own topics, keep them open ended and short

Some consultancy/work related questions that each might answer in the context of exploring perceptions versus realities.

A) Do I get more personal wellbeing (satisfaction) from my working relationships than I do at home?

If this is true, what can be identified that is more (most) fulfilling?

How can family time(s) become more fulfilling?

B) All of us have 168 hours in the week to accomplish needed tasks, using a scale of 1 to 10, ten being very content with time allocation, rate your allocation of time between work and family. If less content, discuss possible changes to make.

Do you negotiate for more time to pursue or complete activities?

C) What times, specifically, during the week, month or year are most stressful for you?

D) Is each of you aware of the normal stress of the other's job/career?

E) Have you attained your career objectives? If not, how might the spouse/partner help?

Poster Abstracts

Conditions Associated with Residents' Participation in Activities for Preserving the Rural Environment: A Case of Agricultural Canals in Japan

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An agri-environmental scheme (AES) that financially promotes the communal activity of preserving and improving the rural environment by both farmers and non-farmers will be enforced in Japan in April 2007. Each area, such as a village, will be able to undertake AES on the basis of its residents, agriculture, or environment. However, the factors affecting the residents' participation in this activity should be examined so as to develop an effective scheme. One factor would be the interaction between residents, since a resident's decision regarding the supply of local public goods in environmental preservation is influenced by those of others. We examined the influences of both the interaction and residents' socio-economic characteristics on their participation in improving the ecological condition of the agricultural canals using stated preference methods. Agricultural canals provide water for rural life, environment, and irrigation. Survey data were collected from 130 residents living in a village in Japan. Each participant was asked whether or not he/she wished to participate in the activity given the percentage of others residents involved in it. After analyzing the data using a random parameters logic model, the following results were obtained. First, some farmers tended to decline participation if others had decided to participate. Second, other farmers and all the non-farmers tended to participate provided others had decided to participate too. Finally, participation was also significantly influenced by the participants' attitude toward agricultural canals, their relationship with agriculture, and their sex, age, and family size.

Keywords: rural environment, agricultural canals, communal activity

Production Efficiency of Soybean Farmers in the Guinea Savannas of West Africa: Empirical Evidence from Nigeria

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This study estimates technical, allocative and economic efficiency measures for soybean farmers in the guinea savannas. A multi-stage sampling technique was employed for collecting primary data from a sample of 182 soybean farmers from Borno State, Nigeria, using structured questionnaires administered in 2006. Descriptive statistics and stochastic frontier production function using the maximum likelihood estimation (MLE) technique were used to analyse the data. The results show that soybean production is characterized by technical inefficiency as confirmed by the significant gamma (γ) of 0.79. The determinants of production, which include farm size, seeds and hired labour, were found to be statistically significant (ρ = 0.05). The estimated technical (TE); allocative (AE) and economic (EE) efficiencies of 0.98; 0.58 and 0.57 respectively were obtained from the analysis. This means that soybean farmers have to become better at choosing the cost-minimizing input bundles rather than using resources in the technically most efficient way as TE contribute more to EE than AE. The implication of this finding is that overall economic efficiency (production efficiency) could be increased by improving the allocative efficiency of soybean farmers by 42 percent through better-input allocation in the cost minimizing way.

Keywords: production efficiency, stochastic frontier, cost functions, soybeans

Case Study Examination of Farm Problems and Perceived Solutions on the Eastern Darling Downs, Queensland, Australia

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This research explores perceived business management problems on Darling Downs farms and examines farmers' perceived solutions as well as whether an integrated management system can improve the business management on these farms. A phone survey of 50 respondents was completed within the Darling Downs to establish farm problems and solutions, preferred training, management systems being used, extent of benchmarking and the interest in an integrated management system. The major problems identified consist of the weather, rising input costs affecting 98% of farmers, low commodity prices, difficult finding labour and the government legislation and regulations. Farmers' solutions for improving their situations were limited, but some involved rain, government support and recognition, improving planning and efficiency and marketing. Extra help/training/discussion in business management was found to be only moderately important in improving the current situation of farmers. Farmers identified that greater training is required in computers and book-keeping. Forty-three percent of farmers perceived themselves to be above average in receptiveness to change. Farmers use different management systems such as accounting, production, GIS, spreadsheets, best practice and EMS. These were all found to be very important in managing the farm business with 97% of respondents using accounting systems and over 61% of farmers using production systems (paddock and livestock).

Keywords**:** farm management, profitability, management systems, farm problems

Rural and Urban Influences on Agricultural Land Values

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Increasing land values pose challenges to farmers, both established and prospective. For established farmers, high land prices may make selling attractive, either to fund retirement or to finance the purchase of an alternative site with fewer urban intrusions. For prospective farmers, high land prices create a barrier to entry. The purpose of this poster is to invite discussion of factors impacting land values, using research on urban, recreational and rural influences on land values as a basis for discussion. Time-series data for Oklahoma agricultural land sales from 2001-2005 are analyzed to measure the impacts of agricultural, recreational, and urban factors. Agricultural influence is measured by the percent of acres in irrigated land, cropland, pasture, water, timber, and waste plus rainfall and crop and livestock income. Recreational use is portrayed using recreational income and deer harvest data. Urban influences are captured through population density, population growth and per capita income variables. Hedonic regressions are used to estimate results for the capitalization model in which agricultural land values derive from discounted returns to the land. Three models demonstrate differences in impacts on tracts of different sizes. Results indicate that agricultural factors and tract size are important determinants of land values. Although recreational income was often insignificant, positive significant coefficients on the deer harvest variable supports the idea that recreation uses are an important factor in explaining land value. The positive impact of urban influences is registered through both population density and per capita income.

Keywords: land values, land prices, urban/recreational/rural influences

Five-Year Financial Analysis of two Commercial Farms Converting to Organic: 2000-2005.

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To determine the effect on farm profitability of conversion to organic status on two Scottish farms, physical and financial records were used to compile management accounts according to the Scottish Executive Farm Accounts Scheme (FAS) procedures. Accounts were adjusted so that all land was tenanted, with rental charged on owned land; family labour was charged at manual wage rates on hours worked; and all interest charges were excluded. Farm 1, in east Scotland, had cereals, seed potatoes, beef and sheep. Conversion was phased; investment in refrigerated potato storage allowed organic vegetable production with increases in labour and machinery costs. The farm used a seven year rotation of 4 years grass, potatoes, vegetables, and undersown barley. Farm 2, a 300 - cow dairy unit in southwest Scotland, all in grass or whole crop cereals, reduced cow numbers to 200 and labour by one. Stocking levels had to be reduced on both. During the conversion period, when no organic premium was received although variable costs were reduced, the organic aid payments did not maintain profitability. Phased conversion may reduce this effect. Structural adjustments to reduce fixed costs or increase income using new enterprises may be required to maintain income which is dependant both on the premium for organic produce and organic aid payments.

Keywords: organic conversion, finance, dairy, general cropping

Intensity of Agricultural Contractors Usage on Suckler Beef Farms in Ireland

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Agricultural contractors have an important support role on suckler beef farms. Data to quantify the usage of agricultural contractors were collected for 115 spring calving suckler farms over a 12 month period. Each month the participating farmers completed a questionnaire documenting the type and duration of contractor usage. A total of 616 suckler beef enterprise related contractor tasks were identified over the 12 month period. The tasks were forage conservation, manure handing, land maintenance, building maintenance, fencing, hedge-cutting, fertiliser spreading and animal husbandry. Results from the study show that contractors were employed for a total of 11,719 hrs. Contractors were used for 5,983 hrs on forage conservation attending 98 farms (197 tasks) with a mean of 2.0 visits per farm and a duration of 30.4 man hours per visit. The corresponding values for manure handling were 1736, 66 (169), 2.6 and 10.3, for land maintenance were 1613, 38 (56), 1.5 and 28.8, for building maintenance 1026, 18 (34), 1.9 and 30.2, for hedge cutting 458, 34 (46), 1.4 and 10.0, for fertiliser spreading 104, 17 (24), 1.4 and 4.3 and for husbandry 419, 22 (67), 3.0 and 6.3 respectively. Forage conservation and manure handling accounted for 51% and 15% of all contractor time respectively, in contrast to hedge cutting and fertiliser spreading which accounted for 4% and 1% respectively. This study shows the considerable dependence of the suckler beef farms on agricultural contractors and the critical need for forward planning so that tasks can be efficiently undertaken.

Keywords: contractors, farms, suckler beef, tasks

Lost Rivers Grazing Academy: MiG for Sustainable Livestock Production

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U.S. pastures are generally grazed season-long. Pastures grazed longer than 30 days have a harvesting efficiency of 40% or less. High stocking rates and low stock densities commonly lead to overgrazing which limits re-growth and overall yield. Pasture operators lack motivation to improve management because:
1) conventional systems are viewed as adequate;
2) pasturage operations are often seen as having little to contribute either ecologically or economically to the operation;
3) pastures appear to be more resilient to abuse;
4) often pasture land is perceived as marginal and of limited financial value.

To improve livestock operator understanding and implementation of the principles of Management-intensive Grazing (MiG), programs featuring hands-on 4 day workshops for operators have been held across southern Idaho. Topics covered in the 45 hours of hands-on training include the five principles of grazing, economics, cost control, and marketing tools for managing grazing, anatomy and physiology of forage plants, grazing cell design, low stress livestock handling techniques, and livestock health considerations so lifestyle and enterprise are sustainable. Participants in these workshops have implemented what they learned on their places with both environmental and financial success. This growing network of operators is using economically efficient and environmentally acceptable methods for forages plus allowing them to remain in their communities as a positive contributor to the local economy.

Keywords: sustainable production, grazing, efficiency

RightRisk: Risk Management Training for Agricultural Managers in the Rural United States

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RightRisk is an Extension education program offered across the rural United States since its inception in 2002. Team members offer these programs using portable computer labs and web-based software to managers located in remote locations from the bottom of the Grand Canyon to the windswept-plains of Wyoming. Program offerings have expanded beyond the risk simulation – Ag Survivor – to include a ten-step process for strategic risk management with accompanying tools for implementation. Additional courses covering dimensions of risk management have been developed, including: *Rural Enterprise Feasibility*, *Taxes for Agricultural Enterprises*, and a two-module course entitled *Reaping a Legacy in Agriculture*. Alternative scenarios, covering various agricultural enterprises, make the simulation relevant to managers of rural farms and ranches. This flexibility and broad relevance of the fundamental concepts presented make these educational programs appealing for application in other rural areas.

Keywords**:** rural family, enterprise management, risk management

Enterprising Rural Families: Helping Families Manage Rural Enterprises for Success

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Enterprising Rural Families is a course designed to assist families manage their rural enterprises for success. It was conceived by Extension educators in the United States working with collaborators in Queensland Australia and British Columbia Canada. A robust, visual model describes the interlinking and overlap of individual, family, business, and community systems surrounding and shaping the rural family enterprise at its core. Originally developed as an online course with supporting electronic monthly newsletter, the team is more recently developing CD-based modules for distribution and presentation in other venues. *Strategic Management* focuses on assisting families define and achieve the success they desire. The *Resource Inventory* course is designed to aid in resource identification and assessment. Enterprising Rural Families provides hands-on solutions to issues faced by rural enterprise managers everywhere. As such, the course is especially relevant to areas intent on rural revitalization.

Keywords**:** rural family, enterprise management, risk management

The Role of Renewable Energy Resources in Hungary: Objectives, Facts, Potentials

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The energy demand growth is one of the most actual problems or every nations and supranational organizations. The direct influence of application of the renewable energy resources is: reducing the quantitative limitation in the energy market, and indirectly, answer to a problem of the environmental protection, the waste disposal and – through the agriculture – the rural (e.g.: unemployment, depopulation, overproduction, regional precipice). The European Union realizing these advantages placed in central is renewables which use the agricultural primary or secondary production. The RES potential in Hungary is around 2700 PJ per year, but the real utility approximately 15-20 %. This share covers at 30-40 % the total energy supply. A critical point is creating a complex energy-system, which follows the directions of Energy Policy of EU, and it is optimal in view of ecology and economy. This study shows commitment of Hungary toward the unionistic ambition in view of alternative energy resources: previous and present plans and his results and to find unutilized opportunities which accomplishing the responsibility about change of energy structure and Kyoto Protocol. The research focused on the agricultural sector which was „the greatest loser" of our accession in 2004, but it possesses huge RES potential, approx. 300 PJ per year. Part of the paper explains how the bioethanol and biodiesel support: the improvement of competitiveness in Hungary, the ecological and economical sustainability in the agricultural production, and gives a short overview about main lessons and aspires to present it in objective.

Keywords: renewable energy resources, agriculture, environmental protection, rural

The Profitability of Variable Rate Application of Nitrogen

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Internationally, input costs, especially fertilizer, increased substantially in recent years, forcing farmers to find means of making the use of fertilizer more efficient. Variable rate application of inputs, a relatively new concept in South Africa, is one of the most important modern technologies in agriculture that can assist farmers in an endeavour to promote sustainable success of their farming operations. Farmers are increasingly viewing precision agriculture as a tool that can help them increase yields and/or improve the efficiency of input use. However, variable rate fertilizer application involves radical changes and/or high investment in the technology as well as additional management capacity; and the widespread adoption of this technology has been limited by questions relating to the profitability of thereof. This paper evaluates the profitability of variable rate application of nitrogen (N) as applied to a maize field in the Bothaville district of the Free State Province in South Africa. The strip plot design of 180 strips was used for this research. This design involved treatments that run in the same direction across the field as planting and harvesting. The objective was to determine the maize crop response to different N rates and to estimate the profitability of variable rate (VR) relative to the single rate (SR) application of N. The results indicate that yield and ultimately profit, differ between management zones, as well as between the two treatments. Higher profit is obtained with VR in comparison to SR.

Keywords: variable rate fertilizer application, profitability, single rate application, yield monitor data, on-farm comparisons

Veterinary Component Costs on Irish Dairy Farms – A Pilot Study

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In recent years a perception has arisen among farmers that vet costs are increasing at a disproportionate rate to that of other variable costs at a time when net profit from milk production is falling. However, it is not clear what components of vet costs are contributing to this rise. The objective of this study was to design a recording format to capture vet component costs (VCC) where interrogation of agricultural databases (ePM, DairyMIS, CSO, dairy co-ops) revealed that none contain comprehensive VCC. A Delphi technique was used to collate expert opinions of Teagasc research, advisory and farm management staff and private veterinarians on a new recording format which was then tested by on-farm interview. The re-drafted format was distributed to experts and the format again re-drafted and re-tested by on-farm interview. The format separates enterprise types and includes stock type and numbers, vet problems, visit, services and product fees. Within each cost category, subcategories are itemised, e.g. tail paint, scanning and drugs under infertility. A pilot study showed that mastitis was the highest ranked VCC. Vet costs per cow and per farm ranged between €51 and 87 and €2,106 and €8,011, respectively, for herds of 31 to 120 cows. This study identified the limitations of existing databases and achieved its objective in generating and pilot-testing a new VCC recording format. A database of such costs needs to be constructed and analysed before the issue of why vet costs may be rising disproportionately on Irish dairy farms can be addressed.

Keywords: costs, veterinary, animal disease, Delphi technique

Secure your Competitive Advantage in a Turbulent Global Agricultural Environment

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Farming businesses all over the world are experiencing a decline in agricultural product prices, which put pressure on farming profit and also on competitive advantages. This is due to increased production, improved technologies, availability of information, more sophisticated management styles, etc. Therefore, being only an average farmer will not be enough to experience success in future farming ventures. Exploring competitive advantages can contribute substantially to successful farming as a small improvement may be insignificant in one year but the multiplier effect of such an improvement can be substantial over a 10 year period. The gross margin difference between two sheep farmers (good and poor herd management) farming with 200 ewes each, is R 60 300 per year, which gives a future value of R961 027 over a period of 10 years, cumulative at 10% discount rate. This is the "oil" the modern successful farming business is running on. There are many different ways how competitive advantages can be created or sustained. It can also vary from a few major aspects in a farming business to a number of small advantages. Experiences have learned that the improvement of the productivity of direct productive assets (land and livestock) is a major contributor to competitive advantage. Another major area where competitive advantages can be obtained, is the development of specific marketing strategies and tactics where contracts are obtained where a premium price are negotiated. The poster focuses on different ways that farmers can use to identify, create and sustain competitive advantages. Principles used in this poster are extractions from the book "Strategic approach to farming success", written by Nell & Napier.

Keywords: competitive advantage, strategies, farming success, global changes, multiplier effect.

Woodpigeon Body Mass in Ireland: is Agricultural Intensification Involved?

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The aim of the present study was to gather information on the body mass of the woodpigeon in Ireland, how this mass differed from historical data and why? The study analysed the body mass of 299 adult woodpigeons shot in the years 2000-2002. The present study found that the average body mass of the woodpigeon was significantly greater than that of pigeons in many previous European studies. The results raise the question, is the apparent greater body mass due to changes in agricultural practises in recent decades e.g. intensification? With the implementation of the Common Agricultural Policy the average crop yield has increased from 2.85 tonnes per hectare in 1952 to 8.3 tonnes per hectare (wheat) in 2003. Coupled with the greater productivity of the land is the fact that in recent years a greater variety of crops (e.g. Rape) are now planted. These introduced crops prolong the season of plentiful food availability. It is possible that the greater amount and variety of crops currently available to woodpigeons, has led to an increase in their body mass, particularly in winter, a period which historically yielded little food for woodpigeons. Previously, this lack of available food led to a reduction in body mass e.g. female woodpigeons in some previous studies underwent a 14% reduction in body mass in winter, whereas females in the present displayed a 4.9% reduction in body mass during the same period. A reduction in body mass increases the possibility of over-winter mortality.

Keywords**:** woodpigeon, agricultural intensification, body mass

Watershed Evaluation of Beneficial Management Practices (WEBs): On-Farm Economic Assessments

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In 2003-2004, the Canadian government initiated a $110M Greencover Program to help local farmers improve grassland management, protect water quality, reduce greenhouse gas emissions, and enhance bio-diversity and wildlife habitat. This 5-year program included a Watershed Evaluation of Beneficial Management Practices (WEBs) component. WEBs mandate is to assess effectiveness of selected farming practices in improving water quality and to evaluate the economic benefits and costs. Evaluating land use practices and their impacts at a watershed scale is extremely challenging. Economic studies have generally looked at narrowly defined aspects of land use and water quality, and few have attempted to integrate the economic factors with the agronomic, environmental and social impacts of watershed management. Data requirements are enormous, and the linkages among the multitude of variables are complex and not well understood. Effects of specific practices may take years to become manifest. Moreover, farmers need to know how the practice or technology fits into their farming operation, and potential impacts on their cash flow and net farm income. WEBs is a multi-disciplinary project involving researchers from natural as well as social sciences. Two to five practices are being assessed on each of seven watersheds scattered across Canada. Specifically, the on-farm economic analysis will determine the economic feasibility of adoption. It will determine the cost of adoption, and the impact on farm cash-flow and net farm income. It will also identify potential barriers to adoption. A SWAT modeling framework is being used to develop an Integrated Economic-Hydrologic Watershed behavioural model for two sites. Obtaining farm-level economic data is a significant challenge. The main data sources are field surveys, supplemented with consensus, GIS and published farm data**.** Findings will benefit individual farmers, policy makers and other stakeholders.

Keywords: water quality, beneficial management practices (BMPs), economic benefits and costs

US Extension Risk Management Education Program

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In the Agricultural Risk Protection Act of 2000, the U.S. Congress required USDA-Cooperative State Research Education and Extension Service (CSREES) to establish a program under which competitive grants are made to qualified public and private entities. The purpose of the grants are to educate agricultural producers about the full range of risk management activities, including futures, options, agricultural trade options, crop insurance, cash forward contracting, debt reduction, production diversification, farm resources risk reduction, and other risk management strategies. CSREES utilizes four regional Risk Management Education Centers with support from the Digital Risk Management Center at the University of Minnesota to operate the program. These centers provide funds on a competitive basis to those who have the expertise to develop and deliver risk mitigation educational materials to producers. Any private or public entity that can show it can prepare highly professional educational programs for producers on risk management is eligible to apply. The four regional centers receive proposals and applications online, and the progress of individual grantees is also available. The Center's National Agricultural Risk Library archives final reports, which can be queried by the pubic to provide data and reports to interested constituents, USDA, and Congress. The poster will highlight a few of the over 400 risk management projects which have been funded and how to access the educational materials on-line.

Keywords: agricultural risk management education

Who are Today's Farmers and What are Their Educational Needs?

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Farmers are changing! According to the U.S. Census of Agriculture, almost 78 percent of farms in 2002 had annual sales of less than $50,000 – down significantly from previous years. Farmers have less time available for day-time workshops and are becoming more adept at obtaining information and participating in educational opportunities via the internet and private providers. Extension educators had only anecdotal evidence on the information desired and educational methodologies preferred by farmers. A statistically valid survey was conducted in 2006 of farmers in Arizona, Colorado, and Wyoming. The questionnaire was designed to discover the demographics, preferences for learning methodologies, greatest threats, and information demands of today's farmers. Survey results will aid in the identification of new Extension clientele and their education methodology preferences and perceived risks. Educators will be better able to develop risk management programs demanded by a far broader audience and to more efficiently use scarce resources.

Keywords**:** rural family, clientele, education, risk management, farming

Innovations in Teaching Farm Financial Management to Producers

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The United States Congress mandated in 1994 that Farm Service Agency (FSA), our lender of last resort, borrowers would be required to participate in farm financial management training. University of Kentucky Farm Management Specialists developed an Extension training program specifically for this purpose. A substantial registration fee, the compulsory nature of the training, and a grading requirement combined to make a challenging educational task. Participants with little experience in financial management further complicated the endeavor. These conditions created the need for new ideas to overcome the obstacles. This poster presentation will serve to highlight, display, and demonstrate the new educational ideas used. The innovations to be depicted include:

- Simultaneous use of two overhead projectors to facilitate the teaching of both farm record keeping and the preparation of financial statements
- Simplification of a traditional Balance Sheet and an Accrual Adjusted Income Statement
- Use of color coded information sources to facilitate preparation of financial statements
- Revision of an existing Kentucky Farm Record Book to include new financial statements
- Integration of enterprise budget related information into record keeping exercises

Each of these innovations in teaching financial management to this Extension audience may sound easy, simple, and straight-forward. It was not! This group required a "greatly simplified" approach. Each new idea took exhaustive testing through application in our workshops to perfect. Ultimately, the innovations proved to make the teaching of farm financial management both more efficient and more effective.

Keywords: innovations, teaching, farm, financial, management, extension

Risk Management of Livestock during Drought in South Africa through Raindex: the Case of Kuruman

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Drought forms an integral part of farming in arid and semi-arid parts of the world, especially in the Kuruman district (situated in the Northern Cape province of South Africa) where the risk is even higher due to a skew distribution of rainfall where the median rainfall is lower than the average. Farmers are constantly faced with critical decisions during drought spells. They must decide whether to buy feed or sell breedingstock. This poster demonstrates the risk of selling productive animals at low prices during drought spells and buy livestock back when prices are high after the drought due to a high demand for productive livestock, as apposed to buying feed for the livestock to maintain a core herd. The value and advantages of Raindex (an insurance package to assist rangeland farmers to reduce the risk of drought) will be showed to combat the business and financial risk of rangeland farming in South Africa. The effect of Raindex on beef production is demonstrated to illustrate the extent of thereof over a 40 year period. It is important to evaluate the effect on the cash flow as well as gross margin. It needs to be investigated if this product will be economically viable for the farmer. The return on investment must allow the farmer to generate optimal profit out of the core herd that will give the business a competitive advantage.

Keywords: drought, livestock, rainfall, financial risk, management, Raindex

Social and Therapeutic Glasshouse Horticulture

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The objective of this research is to design a business concept for health care within a glasshouse company. Farming for Health is a growing phenomenon in The Netherlands and a rather successful way of broadening activities and increase income. Some glasshouse growers have interest in combining horticultural production with health care. Together with them research aims to design a business concept for health care with the following restrictions. Production is the main function of the company. Alongside is room for care tasks. The glasshouse company is economically viable. Examples of health care farms and a health care nursery are collected. Contacts were laid with health care institutions. A workshop was held with stakeholders. At the moment some of the growers are speaking (negotiating) with health care institutions and financing parties. Financial part of the future therapeutic glasshouse company needs extra attention. Integration of social function must fit the business strategy of the entrepreneur and relate to his own motives. Some growers, health institutions and their patients, and municipality are interested in social and therapeutic glasshouse horticulture. Implementing health care means extra financial risk for the grower. Income out of care function depends on the number of patients that came to the nursery on a day, while costs are made in before for the necessary assistance. Some initiatives have started.

Keywords: sustainable glasshouse horticulture, health care farming, entrepreneurship, social and therapeutic glasshouse horticulture

Logistics Management as an Assisting Tool of Sustainable Development of Farms

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The idea of sustainable agriculture cannot be limited to maintaining in the natural environment balance but should be understood in a wider context of social welfare. It seems that one of the ways of creating internal balance in farms could be to introduce the concept of logistics to the management sphere. This concept concentrates on optimizing material and information flows, both inside the farm and over the entire supply chain. It follows that logistics by the co-ordination and integration of phases and processes should be treated as a tool which includes potential possibilities of sustainable development. The logistics cost and particularly its complex approach are very important in optimizing the process. But there are some difficulties in the identification, evaluation of the level and structure of this type of cost, because of applying the traditional cost accounting (TCA). Taking the above into consideration, the identification and the evaluation of the level and structure of logistics costs in farms in process aspect was the purpose of the research. Based on the investigations, three kinds of logistics processes affecting sustainable development of farms, were identified: passages between farm buildings and fields, passages on the fields, loading and unloading processes. Optimization of such processes could assist the realization of strategic aims of sustainable development of farms. The introduction of mechanization in such logistics processes as loading and unloading, caused a reduction of human labour input (by around 50%) and an improvement of its quality. Conducting research on the optimization of logistics costs in farms, including the share of this kind of costs in the total production costs (38%-47% in the analyzed farms), seems to be fully justified and could give a marked increase of farm income.

Keywords: logistics management, farms, sustainable development, logistics processes, logistics costs.