

Concept document on the establishment of a Community of Practice



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1. Introduction

Global seafood consumption is steadily increasing with increasing population but since the 1990's the majority of growth has been from aquaculture while capture fisheries has remained relatively stable. Aquaculture contributes approximately 46% to global fish production and is projected to increase by 32% by the year 2030. The biggest regional expansion, up to 48%, is expected in Africa (SOFIA 2020).

In 2014, Operation Phakisa was launched by government to fast track the implementation of specific large-scale programmes that have significant potential for economic growth and employment in South Africa. One such programme involves the unlocking of the potential of South Africa's oceans, which led to the launch of the Ocean Economy leg of Operation Phakisa in July 2014. Operation Phakisa: Oceans Economy focuses on six key areas of key growth: Aquaculture; Offshore Oil and Gas Exploration; Marine Transport and Manufacturing; Marine Protection and Governance; Small Harbours Development; and Coastal and Marine Tourism.

The Aquaculture Lab comprised of stakeholders from industry, government and academia who identified nine (9) key initiatives. One initiative addresses the selection and implementation of catalyst projects, improving both the number and productivity of the new farms. Three initiatives relate to the creation of an enabling regulatory environment and others focus on funding support, increasing the skills pool and awareness; and improving access to markets. The initiative nine "Develop and Implement Aquaculture Development Zones (ADZ's) seeks to promote investment into the sector and create an enabling environment.

The Department of Higher Education and Training in collaboration with the South African International Maritime Institute (SAIMI) established six multi-stakeholder Skills Initiative Working Groups to ensure an effective response to skills development needed to grow the ocean economy across the various initiatives. The mandate of the Skills Initiative Working Groups is to co-ordinate the implementation of the oceans economy skills development initiatives in the 3-foot plans of each Operation Phakisa Oceans Economy delivery units.

Aquaculture is a relatively new and technology driven sector that depends on research and high skills base in multiple disciplines. Achieving economically and environmentally sustainable growth of the sector relies on expertise such as engineering, aquatic animal health, food safety, economics, oceanography, zoology, biology, ichthyology and so forth. For South Africa to develop the relatively small aquaculture sector and become competitive, it must refine production technology for existing farmed species (e.g. abalone) as well as develop technology for the farming of indigenous high value species (e.g. sea urchins).

The aspiration of the Aquaculture Lab and more specifically, the Aquaculture Skills Working Group facilitated by SAIMI, is to ensure skills development to meet current and future growth needs of the sector. In 2017, SAIMI commissioned a skills needs analysis of the aquaculture sector in order to unpack the skills needs and develop an

implementation plan. The skills needs analysis identified various critical and scarce skills in the sector which include but not limited to:

- Aquatic Veterinarians;
- System building/innovation for aquaculture;
- Hatchery specialists;
- Food safety for aquaculture;
- Feed development;
- Aquaculture economists;
- Production modelling;
- Grow out production specialists

In addition to the broad range of technical and specialist skills required in the sector, the skills needs analysis determined there was slow transformation in the senior management levels in the sector as well as professionals within the private sector.

The establishment of a Research Chair and/or Community of Practice has been identified as a key intervention to co-ordinate multi-disciplinary research focus areas as well as concentrate research focus on key areas to improve the growth as well as sustainable management of this sector. The Research Chair and/or Community of Practice aims to develop local specialised skills required for sector growth and innovation as well as promote transformation within the scarce skills through students and training.

2. Purpose of establishing Community of Practice for Aquaculture

Research is one of the critical pillars of developing scarce skills, innovation, and knowledge within a country. Multi-disciplinary research is required for the development of the aquaculture sector and there is a need for co-ordination and collaboration of various disciplines to achieve the objectives of the Oceans Economy and the National Development Plan (Objective 4: Inclusive growth, Objective 7: rural development, Objective 10: enhance environmental resources). The Aquaculture Research and Technology Development Programme for South Africa highlights the diverse research focus areas required to foster sustainable production (Figure 1) and the need for increasing competitiveness and diversification (Figure 2) of the sector.

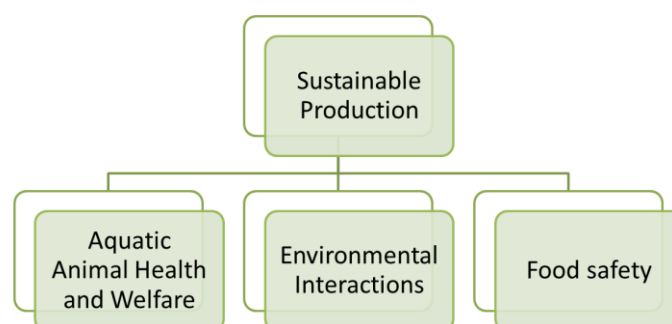


Figure 1: Key research focus areas for sustainable production

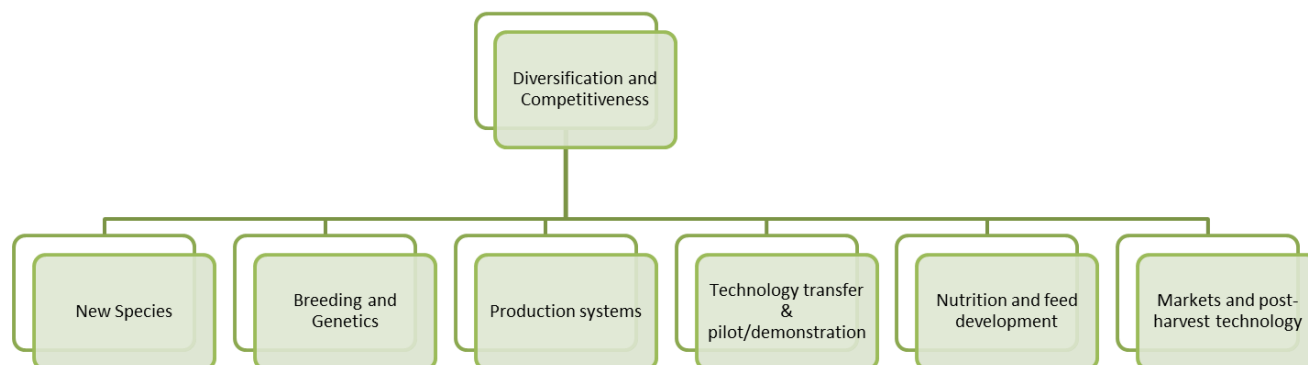


Figure 2: Key research focus areas for increasing Competitiveness and Diversification.

Given the multi-disciplinary research focus areas required for aquaculture, it is imperative that research is co-ordinated and is of a collaborative nature between various researchers and institutions. The goals and objective of the establishment of a Research Chair and/or CoP is aligned with this requirement.

South Africa has extensive natural resources in terms of species and environment to grow the aquaculture sector. However, in order to realise this potential, research and innovation is required to realise this potential as well as overcome the key challenges in terms of reducing cost of production through reduction of input costs (e.g. feed and electricity), increasing diversity of species that can be farmed in different climates (warm vs cold), technology innovation and continue to ensure environmental sustainable practices and management of the sector (food safety, environment and aquatic animal health).

While collaboration with international countries around technology and innovation in terms of aquaculture is supported, it is likewise imperative that local knowledge and expertise is harnessed to develop solutions relevant to local conditions and species.

3. Profile of the candidate

The person who would become the Community of Practice Leader for the CoP in aquaculture should have a PhD in Ichthyology, Fisheries Science, Zoology, Biology, or aquaculture related field, with wide-ranging research experience in focus areas related to aquaculture. Should the Interested leader lack the above listed requirements, the core members of the proposed CoP must meet the above qualification and experience requirement. The key responsibility areas would be multi-disciplinary but should include aspects of enhancing aquaculture production processes, diet development and nutrition, disease and health management, environmental sustainability, value chain development and development of new

potential species. The candidate should be able to assess, coordinate and manage the research at a high level while ensuring implementation and completion of the projects occur. The candidate must be able to collaborate with industry, academia and Government helping drive aquaculture research in SA.

4. Potential focus areas for the Community of Practice

As per the NRF framework for Community of Practice (2024) *"Communities of Practice are defined as research-led alliances, in which established researchers collaborate to produce solution-oriented research findings with an intention to translate research outputs into tangible outcomes and influence policy development and implementation through communication of the necessary research findings"*. Research collaboration into key focus areas of the aquaculture sector is in line with the following themes supported by the UN sustainable goals for development:

1. Poverty alleviation, inequality, and development.
2. Inclusive rural economy, employment and building a capable state.
3. Energy, climate change, environment, biodiversity and transitioning to a low carbon economy.
4. Knowledge economy and innovation.
5. Engineering and Technology.

"The overall aim of CoPs is for Research Chair-led alliances to communicate their solution-orientated research findings in given forums to various stakeholders; government officials, practitioners, policy makers, academics and civil society, with an intent to provide solutions that can mitigate social and economic challenges faced by South Africa. This aim has the following subsidiary objectives:

- a) To form strategic partnerships within the local and international research community, with the aim of producing solution oriented scientific research findings.*
- b) To make research meaningful to society by translating research findings into actionable policy activities. It is envisaged that this new knowledge will afford South Africa a competitive edge internationally and contribute towards growing the economy of the country and improving the quality of life of South Africans.*
- c) To bridge the gap between science and society by providing a platform where ideas can be shared for the mutual benefit of science and society. ." (NRF, 2024)*

As indicated in figure 1 and 2, there are a broad range of key focus areas required for development of the aquaculture sector. The focus area of the CoP could therefore be diverse and depend on the expertise and research focus of the collaborating institutions as well as skills development needs. Some of the potential focus areas are listed below for reference and discussion:

1. Optimisation of production techniques and processes for current SA aquaculture species
2. Least-costed and replacement of fishmeal in aquaculture feeds
3. Improving energy efficiency, reducing carbon footprint, and reducing cost in land-based pump ashore and Recirculating Aquaculture Systems
4. Value adding of aquaculture primary and by-products (e.g., shell grit, fish skins, etc.)
5. Offshore marine aquaculture technology development (bivalve, seaweed, and finfish)
6. Improvement in diagnostics and prevention of aquatic diseases
7. New species technology development
8. Consumer behaviour and nutritional quality of aquatic foods
9. SMEs, informal markets, and value chain optimization

5. Conclusion

The DSTI/NRF and SAIMI are establishing a CoP in aquaculture which will be linked to the Operation Phakisa Oceans Economy Aquaculture capacity development initiatives. The CoP is the preferred avenue to explore, however, it should be noted that there are no known SARCHI chairs with direct links in aquaculture research. Interested existing SARCHI chairs are therefore invited to lead a CoP in the above listed aquaculture focus areas.