

NATIONAL AQUACULTURE STRATEGIC FRAMEWORK (NASF)

DRAFT

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1. INTRODUCTION

1.1 The Justification of and Approach to Developing a National Aquaculture Strategic Framework (NASF)

Aquaculture, the **farming** of aquatic organisms, in SA is in its infancy with output being insignificant in continental and global terms and despite some early progress in the early 1990s has declined in recent years. Recognising the potential opportunities presented for job and wealth creation, transformation and food sovereignty, the government is committed to reverse this process.

To date several factors have culminated in suboptimal development of aquaculture in South Africa. Principally, the sector is fundamentally constrained by, *inter alia*, a distinct lack of an **enabling** regulatory environment which is currently characterized by unjustified overregulation when compared with other food production sectors, and by an un-coordinated institutional environment e.g. fragmented policies and strategies from various tiers government and departments. Moreover, the technical challenges posed by the South African high-energy coastline with a limited number of naturally protected sites; limited suitable aquaculture candidates and below ideal water temperatures has hitherto not been prioritised and adequately addressed. Consequently, aquaculture production has stagnated and declined and requires appropriate government intervention to kick start the sector to reverse this process. Therefore a National Aquaculture Strategic Framework with funded action plans that prioritises doable short to medium objectives that also in line with broader national goals is required.

The government will craft clear and succinct objectives and take due cognisance of similarities and differences between itself and a range of countries engaged in successful aquaculture, in particular, with reference to (i) stage of development of the aquaculture sector, (ii) socio-economic environment (iii) climate, (iii) water and land availability and access, (iv) nature and topography of the coastline and, (v) market dynamics.

In developing the strategic framework due cognizance will be taken of the current position of South Africa in relation to global aquaculture production, in order to contextualize the challenges the government faces in creating and ensuring the appropriate enabling regulatory environment required to optimize its opportunities and actively contribute to national food sovereignty, national wealth and job creation and to regional and world fish supply. A brief synthesis of global aquaculture trends is therefore presented below together with a brief status of aquaculture in SA.

1.2 Background to Aquaculture

1.2.1 Global synopsis¹

While the global demand for aquatic products is increasing, wild harvest fisheries are under considerable pressure and their growth is either stagnant or declining. It is now internationally accepted that the increased supply of fish products to meet this demand will be sourced through aquaculture. Nations around the world have taken up this challenge and have developed suite of technologies to farm a range of globally available aquatic organisms to meet their local and international demand.

Consequently, aquaculture, the **farming** of aquatic products, is the fastest growing food production sector in the world, growing at an annual rate of 8-10%/yr for the last two decades and outstripping livestock 3-4 fold. In 2008, global aquaculture production reached 68 million tonnes, valued at US\$ 106 billion and increased its proportional contribution to total fisheries from 15% in 1988 to 46% in 2008. This contribution, however, is largely an Asian phenomenon. Asia accounted for 62.4 million tonnes or 91% of total world aquaculture production in 2008, while Americas, Africa and Europe, contributed 3.5, 1.4, and 3.4%, respectively.

Although over 200 species/species clusters are farmed the majority of production stems from a relatively few species and species clusters. In Europe, salmon and trout account for 52% of production, in Asia, the carps and now tilapia accounts for 34% of production. The tilapias (largely *Oreochromis niloticus*), mullets and catfishes account for 75% of African production.

A significant proportion of farmed aquatic products are farmed with minimum impact on the environment when compared with other food production sectors such as agriculture and livestock, whilst maximizing benefits to society. In 2008, freshwater fishes accounted for 46% of global production whilst the 54% was of marine and brackish origin. Of this 54%, around 70% are aquatic plants and molluscs that are not feed dependent and as such, actually remove nutrients from the natural waters, thus aiding coastal de-eutrophication and ameliorating negative impacts of other sectors.

To date exotic species account for around 25% of world finfish and shellfish production. Rainbow trout was introduced for food or sport to at least 45 countries outside its natural range producing over half a million tonnes. Although indigenous to Africa, tilapias are now widespread in all countries of the subtropical and tropical region and in 2008 these countries produced around 2.4 million tonnes of relatively low cost protein for domestic consumption. Similarly, the salmonids introduced in Chile support a thriving multi billion dollar aquaculture industry that is responsible for approximately 20% of the world's farmed salmon and directly employs approximately 30 000 people. The cupped oyster, native to Japan, was introduced to around 30

¹ Data source FAO, 2010.

countries (including the UK, France, USA, Canada, Korea, China and New Zealand) where around 3.4 million tonnes were produced in 2008.

In addition to aquaculture, introduced species such as tilapias support significant culture based fisheries in countries such as Brazil, Mexico, Sri Lanka, Philippines, Indonesia providing low cost protein and vital income for rural, in particular asset less, communities.

1.2.3 Brief Status of Aquaculture in South Africa

In 2008, South Africa farmed only 5000 tonnes of aquatic products, (1800 tonnes of aquatic plants and 2000 tonnes of shellfish fish and 1200 tonnes of fresh fish products) representing 0.1% and 0.01% of Africa's and world aquaculture production, respectively. Over a third of SA's reported production is seaweeds while the remainder comprises trout, abalone, molluscs, oysters, tilapia and catfish (Table 1). To date, South Africa has not commercially produced any marine finfish.

Overall, the South African aquaculture sector remains relatively small but in keeping with many countries is largely based on introduced or exotic species (see Table 1 - 61% of total fish and shell fish production in 2008), highlighting their importance to current and future aquaculture development in South Africa.

Table 1. South African fish and shellfish production in 2008.

(Source: FAO: 2010)

	Production (Tonnes)	
	2000	2008
Marine		
Aquatic plants	12	1800
Abalone	181	1037
<i>Oysters</i>	247	226
<i>Mussels</i>	500	736
Prawns	127	0
Marine Finfish	0	3
Mullet	16	0
Freshwater		
<i>Trout</i>	1554	1000
<i>Nile tilapia</i>	80	20
<i>Mossambicus tilapia</i>	30	0
African catfish	23	180
<i>Common carp</i>	25	0
Mullet	15	0
<i>Largemouth bass</i>	8	0
<i>Marron crayfish</i>	2	2
Others	0	45
Totals	2820	5049

Species in red italics are exotics

Finfish

To date, despite almost two decades of R&D and predictions (Shipton and Britz, 2007) no notable marine fish production is reported nor has their commercial viability based on high capital invest demonstrated. In contrast, since 1987, freshwater finfish (trout, catfish and tilapia) is the **only** reported farmed finfish with demonstrated technologies, offering the immediate possibility to expand aquaculture production for small-scale farmers. Trout sub-sector, however, has declined largely due to economies of scale and high feed costs.

Shell fish

Abalone farming is the most successful sector in South Africa, in terms of value, is now regarded as one of the leading producers in the world. The rapid increase in production in Asian and South American countries however may check the rate of expansion in SA. In 2008, production in China and South Korea reached 33 000 and 5150 tonnes, respectively. Output from the oyster and trout sub-sectors declined (Table 1) and the prawn sub-sector ceased production, primarily due to the strength of the rand combined with the low price of shrimp on the local and international markets. Mussel production has also declined but potential exist to increase production through expansion with appropriate species with relatively low cost technology.

1.2.4 Scope for Aquaculture Activities in South Africa

The scope of aquaculture is not uniform across the country and will be principally challenged by a largely unsheltered high energy coastline, water temperature and water availability and therefore the scope will be dictated by purpose of culture, candidate species, technologies adopted and economic viability. The principal categories of commercial and enhancement aquaculture are described below.

- i) In **freshwater lakes and reservoirs of appropriative size**: cage culture operations where hatchery-produced fish are grown in floating cages in public waters under provisions of a lease or permit. Potential species include tilapia, catfish and trout
- ii) In **land-based systems**, hatchery-produced stocks are grown in tanks or ponds located on private property. Potential species include tilapia, catfish trout, salmon smolts, cob,
- iii) **Bottom culture and enhancement activities in the intertidal zones.** Two distinct economic activities; (i) farm grown aquatic (marine) plants or sessile shellfish are managed under provisions of a lease; or (ii) marine plants or sessile shellfish are managed without a lease, and a fishing licence is required for harvesting. Species – brown seaweeds glacilaria, mussels, oysters, clams.
- iv) **Cage culture and or Long-line operations** in sub-tidal waters using net-cage systems anchored to the seabed, ropes, trays or rafts. Such Species include Cob, yellowtail, tuna, salmon, trout, mussels, oysters, scallops, marine plants.
- v) **Bottom culture and enhancement operations within the sub-tidal zone** are virtually identical to bottom culture and enhancement activities in the intertidal zone. The principal difference is the location of the activities in the coastal zone and the governing jurisdictions related to the activities. Species – mussels, clams, scallops.

- vi) **Enhancement and/or sea ranching** operations utilize the sea or inland water bodies as an aquatic pasture where hatchery-reared fish are released, forage for food and seek shelter. There are two main forms: inland culture based fisheries and Sea ranching are specific forms of aquaculture that is used to supplement wild stocks with hatchery-produced fish. Aquatic animals are harvested under renewable lease, permits or licences to individuals or communities. To facilitate recapture, sea ranching is commonly conducted with migratory stocks, such as salmon, that return to their natal streams to spawn but ownership of aquatic organism will cause conflict in open access environments where exclusive rights are offered.

TOWARDS DEVELOPMENT OF A NATIONAL STRATEGIC FRAMEWORK FOR AQUACULTURE

This National Strategic Aquaculture Framework was developed at a workshop through an iterative participatory process with national and provincial Governments in May 2010, industry in November 2010 and evolved through a process of post-workshop consultation with relevant stakeholders and supersedes any provincial and municipal initiatives.

2.1 Guiding Principles

Aquaculture development is a priority of government. The Government recognises the opportunities presented by aquaculture and is committed to creating appropriate platforms for access to and optimal utilisation of available resources and existing infrastructure to facilitate new economic activity to create opportunities for wealth creation and gainful employment whilst ensuring the government's key overriding constitutional obligation for a fairer and equitable society is upheld.

The government will create a climate in which aquaculture can flourish and acknowledges that:

- aquaculture development in the SA is in its infancy and therefore requires appropriate and special attention especially for the freshwater sector which shows most promise in the short to medium term but has been hitherto been neglected;
- aquaculture should be recognized as a **farming activity** and its meaning harmonized across all documents and should benefit equally from government support;
- there should be a harmonised national policy leading to a coordinated approach for developing a diverse aquaculture sector;
- aquaculture is a legitimate user of land and water resources. Consequently, the sector deserves equitable access to these resources;
- government investment in appropriate aquaculture research, development, technology transfer, extension, education, and training programmes are prerequisites for sector development;
- the development of species with proven commercial technologies that provide benefit in the short to medium term will be prioritised ²;
- government has a responsibility in facilitating a diversity of entrants from subsistence to small and large -scale producers;
- the international aquatic market is highly competitive, especially given South Africans' geographic location to major export markets;

² The development, commercialization and domestication of potential new indigenous species can take minimum of 15-20 years.

- government recognizes that small to medium scale aquaculture ventures are expected to serve domestic, regional and international markets;
- there is a need for transformation of the SA aquaculture sector into a vibrant commercial industry whilst ensuring fish for food security and food sovereignty.
- government recognizes the contribution the sector can make to meeting national food sovereignty goals as a priority;
- private sector should bear the main responsibility for export orientated aquaculture development in collaboration with government in line with government policies to promote products;
- aquaculture development should strive to improve the domestic and international competitiveness of the sector;
- development of a sustainable and competitive aquaculture sector should incorporate appropriate and pragmatic economic, environmental, and societal principals;
- aquaculture development should have a regional focus and implemented, in a manner consistent with national broader objectives and government responsibilities and norms such as public health and safety, navigation and the environment whilst ensuring parity in treatment with other recourse users and food production sectors;
- aquaculture production will stimulate secondary industries, including feed manufacturing, fish processing, supplies and equipment, and other agricultural and marine trades;
- aquaculture development plan should consist of cost-effective activities that are realistic with expectations that government resources may be limited; and
- an appropriately skilled and trained workforce is essential to aquaculture development in a global economy.

2.2 Critical Success Factors

A number of critical factors are required to secure the development of a sustainable and competitive aquaculture sector and these are addressed in the National Aquaculture Strategic Framework. Effort will focus on enabling the expansion of those areas of aquaculture that will yield early results and support development of targeted aquaculture species which can kick start and expand the sector in the next 5 years.

To maximize probability of success the government will:

- Be instrumental in developing a pragmatic regulatory framework within a supportive operational environment that is appropriate and harmonized between the state, provinces and municipalities.

- Ensure effective coordination among government departments and its agencies to maximize efficiency of development programmes and delivery.
- Identify and invest in and drive priority aquaculture research, development and technology transfer programmes that can deliver in the short (2-3 years) to medium term (5 years) and consider longer term initiatives on merits and achievements to date.
- Expand access to investment and operating capital as well as key inputs such as fingerlings, feeds and equipment
- Develop and coordinate implementation of human capacity building including extension, education, training and public awareness programmes.
- Coordinate development of effective stakeholder partnerships such as community- government, industry-government, industry-institute, and government-institute.
- Coordinate development of effective government promotional, marketing, and trade efforts.
- Develop effective institute-industry and institute-stakeholder partnerships.
- Develop timely and effective bio-security programmes and guidelines.

2.3 Purpose of the Strategy

To provide harmonised national direction and scope for achievable government and private sector interventions for achieving stated goals that facilitate and lead to the removal of constraints and create a pragmatic enabling environment for developing an equitable, diverse, viable, competitive and sustainable aquaculture sector in order to fulfil government and expectations of stakeholder engaged in aquaculture.

2.4 Main Outcomes of the Strategy

- A pragmatic and supportive pro-aquaculture enabling regulatory and operational environment to ensure food security and promote food sovereignty.
- Effective inter-departmental, coordinated and co-operative governance.
- Appropriate and transferable technology for producers to be profitable.
- Creation of a sector which is labour intensive and creates significant numbers of 'decent' jobs and SMEs.

- Available natural, financial and human resources and relevant technology that meets the needs of the sector.
- An economically viable and competitive aquaculture sector with diversified production in accordance with local and global market demand.
- Transformed and fair, equitable aquaculture sector.
- Substantially increased production, trade, and consumption and reduced imports.
- Improved working relationship between public and private sector.

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3.0 NATIONAL AQUACULTURE STRATEGIC FRAMEWORK (NASF)

3.1 Vision

The vision for the SA Aquaculture sector is to:

Develop and grow a sustainable and competitive aquaculture sector that meaningfully contributes to transformation, wealth creation and employment through a diversity of production systems that produces safe, nutritious and affordable food while ensuring the environmental services required for securing its future.

3.2 Mission

Maximize socio-economic opportunities and benefits from aquaculture through meaningful transformation and being a regional leader.

3.3 Goals

To initiate, facilitate and coordinate interventions to remove constraints to create an enabling regulatory and operational environment for developing an equitable, diverse, competitive and sustainable aquaculture sector in order to fulfil all stakeholder expectations. It doing so it aims to:

- i) Establish a flexible and pragmatic approach to respond to shortcomings aquaculture uptake in implementation.
- ii) Develop transferable technology enabling producers to be profitable
- iii) Prioritise employment and wealth creation opportunities.
- iv) Develop smarter dissemination and develop and transfer relevant scientific and technical knowledge to make the aquaculture sector profitable and competitive in the global marketplace in an economically and socially responsibly manner whilst ensuring that the required environmental services are secured.
- v) Ensure transformation and increase social cohesion with emphasis on Youth.
- vi) Prioritise national fish production and food sovereignty
- vii) Engage in regional aquaculture development

3.4 Benefits of a Competitive, Sustainable Aquaculture Industry:

- Creation of significant 'decent work' opportunities
- Creation of SMMEs and wealth generating opportunities
- Creation of transformed sector
- Enhanced national and regional food and nutritional security
- Reduction of the SA trade deficit.
- Leadership in sciences and technologies in aquaculture and aquatic sciences for the region.

3.5 Strategic Approach

The strategic approach for aquaculture development in SA is divided into the following elements, expanding 16 strategic issues.

3.5.1 Developmental focus

Government should:

- Acknowledge that given the potential constraints on funds, expertise and technology, and high infrastructure cost it may have to focus research and development effort on a few species which has a high probability of success in short-medium term and be line with national policies on social delivery.
- Recognize that developing new species, in particular indigenous marine species, typically takes a minimum of 15-20 yrs to realize with no guarantee of success.
- Recognize that in common with other leading aquaculture countries, exotic species makes a significant contribution to aquaculture production in SA.
- Acknowledge that SA has a limited pool of suitable indigenous candidates required to generate required momentum for development.
- Consider an audit of available species for culture and sourcing appropriate species with known technologies to gain momentum for progressing aquaculture in SA.
- Make a clear distinction between high potential and high value of species in the market place.

- Acknowledge that technological innovations are necessary to overcome the limited availability of fresh water, suboptimal all-year rearing temperatures and high-energy coastline.

3.5.2 Policy

Government should:

- Recognise that aquaculture is a legitimate user of land, water and aquaculture resources.
- Recognise that whilst government will supply fingerlings for ongrowing their main role with respect to fish seed is to maintain and supply quality broodstock.
- Promote decentralisation of fish seed supply to reach remote areas through support from local government institutions.
- Recognise aquaculture as a non-consumptive user of water whilst increasing water productivity and water harvesting.
- Promote aquaculture development in accordance with the new partnership for African Development Action plan (NEPAD), where relevant, and the Millennium Development Goals (MDGs).
- Promote good management practices in aquaculture.

3.5.6 Legislation and regulatory framework

Government should:

- Undertake a comprehensive review of all government legislation and any accompanying regulations to identify and remove, where appropriate, constraints to diversify and promote sustainable aquaculture development
- Promote intergovernmental co-operate governance to ensure that all government legislation are equitably applied and that regulations are comparable with other primary food production sectors
- Ensure that other activities external to aquaculture do not compromise resources required by aquaculture
- Promote voluntary codes of practice and self-regulation using iterative and participatory approaches involving public and private stakeholders, use legislation as a last resort.

- Establish clear, enabling, and pragmatic regulations to develop fisheries co-management plans and to secure user rights to land and water.
- Ensure a iterative and participatory approach involving all stakeholders including private sector in policy and development of legislation and regulations
- Ensure industrial scale fish feed manufacturers, fish processors and hatcheries according to agreed standards to ensure nutritionally balanced fish feed, acceptable fish products and fish seed supply

Private sector should:

- Be aware of relevant regulations and control measures and provide feedback on regulations and other procedures constraining development and viability
- Observe procedures, guidelines and regulations in the establishment of aquaculture farms and hatcheries and processing of aquaculture products.
- Liaise with government on the introduction, importation and movement of aquaculture species to minimise disruption to operations and business planning.
- Self-regulate to ensure a safe-to-consume product is provided to all consumers.
- Participate actively in the formulation of policies, strategies, regulations and development programmes.
- Provide complete and accurate data for monitoring by Government.

3.5.7 Financial Services & incentives

The government should:

- Ensure financial assistance to develop aquaculture especially for small scale developments
- Create a dedicated funding programme for aquaculture prioritising actions for short to medium term goals
- Develop links and contribute to project preparation funds with organisations that provide business planning/ modeling/ marketing and other educational and consulting services
- Create awareness to financial institutions about the aquaculture industry, including realistic assessments of risks and returns; and to

improve information-sharing within and outside about aquaculture financial programmes

- Promote and demonstrate through exhibitions and other means the recognition of aquaculture as a viable industry, thereby providing evidence of a long term commitment to the development of the sector
- Facilitate increased access to private sector capital by putting in place a regulatory and policy framework that is more conducive to attracting private sector investment
- Develop appropriate inbound/outbound trade missions in priority species focused on critical issues (marketing, investment value adding etc.) at critical times
- Encourage key industry players to undertake critical investor and market related capacity building amongst current and future proponents in aquaculture.
- Include targeted sectors of the finance and investment community as part of an overall stakeholder communication strategy through the development of a database of potential investors who have a high net worth and/or existing seafood industry experience; and the organisation of regular updates on industry status.
- Make strong representations to the Provincial Governments on investment attraction measures particularly to establish suitably funded Innovative Investment Fund and adapt suitable tax benefit schemes.
- Encourage Provincial and municipal governments' participation in the establishment of pilot (demonstration) farms in high priority species for widest impact, with priority established by government following due diligence.
- Encourage foreign investment and networking for market creation through fiscal incentives

Private sector should

- Review financial assistance programmes to determine their eligibility for aquaculture.
- Work with smaller producers to provide credit

3.5.8 Access to land and water

Government should:

- Facilitate to make available public and private land and water bodies for aquaculture purposes
- Secure access to resources for communities for aquaculture purpose through establishing aquaculture zones and land reclassification
- Ensure that the establishment of aquaculture zones does not prohibit, limit or hinder aquaculture practices outside zoned areas
- Guarantee the rights of aquaculture investors and community to public land to ensure a stable environment whilst ensuring that access to resources by communities are not compromised

3.5.6 Availability of and access to inputs

3.5.6.1 Fish seed

Government should:

- Support training and capacity building and infrastructure on hatchery and mass seed production and management for species for established species
- Accredite hatcheries of different production scales and influence production of high quality seed
- Ensure and maintain high quality broodstock for quality seed production through broodstock management programmes for on growing and broodstock
- Set up proper seed distribution centres and distribution channels

Private sector should:

- Produce and distribute quality and traceable seed.
- Maintain all data concerned with production, distribution and sales of fish seeds.
- Adopt latest cost effective technologies on hatchery management and seed production
- Observe quality assurance and bio-security schemes developed by the state
- Train farmers in treating and management of fingerlings

3.5.6.2 Fish feeds

Government should:

- Specifically support R&D to develop cost effective aqua feeds to reduce production cost
- Set guidelines for industrially produced aqua feeds

Private sector should:

- Produce and distribute quality feed at an affordable price to fish farmers.
- Disseminate information on feed availability, quality, feeding tables, efficiency and price to the public sector.
- Monitor feed performance, and provide feedback on the issues to relevant agencies for technical solutions.
- Observe guidelines on good feed manufacturing practices, storage and use of wild fish in aqua feeds.
- Develop credit schemes for farmers to procure commercial feeds.

3.5.6.3 Equipment and material for aquaculture and enhancement

Government should:

- Initiate and support the establishment and manufacturing of local aquaculture equipment through appropriate incentives.
- Develop and monitor aquaculture and harvesting gear standards.
- Educate farmers in the use and maintenance of relevant aquaculture and harvesting equipment.

Private sector should:

- Produce affordable equipment and material for the sector.
- Upgrade skill and knowledge of making and mending of fishing gears and use of aquaculture equipment and maintenance.
- Demonstrate the operation and maintenance of gears and other aquaculture equipment for durability.

3.5.7 Culture based fisheries

Government should:

- Actively promote the use of state water bodies and intervene if necessary
- Develop and implement community based stock enhancement and restocking programmes and draw a distinction between ranching and stock enhancement
- Resolve conflict and develop fisheries co-management of multi-purpose water bodies with the participation of relevant stakeholders, in particular local communities
- Ensure that state hatcheries are maintained in the relevant provinces

Private sector should:

- Actively participate in the fisheries co-management of water bodies
- Assist with conflict resolution where necessary
- Aware of carrying capacity of the water bodies for sustainable development
- Adopt measures to minimise environmental degradation while practicing cage farming in natural water bodies.

3.5.8 Training, education and capacity building

Government should:

- Incorporate aquaculture into curriculum and establish accreditation schemes to encourage progressive learning outcomes
- Support prospective and current private sector members in obtaining and upgrading the necessary accredited practical skills
- Designate funds for scholarships supporting aquaculture researchers
- Introduce components on aquaculture into existing government training initiatives as appropriate to ensure that government officials who make decisions affecting the aquaculture sector are familiar with the sector and its requirements
- Develop occupational standards and other training and educational initiatives that meet the skill requirements of the aquaculture industry at all occupational levels

Private sector should:

- Provide feedback and advice on training, including the efficiency of training and required training needs.
- Facilitate meaningful practical training opportunities on their farms.
- Large-scale aquaculture enterprises to take the lead in training small-scale farmers.

3.5.9 Research

Government should:

- Establish coordinated, budgeted national investment programmes in aquaculture research and technology development, closely linked to prioritised government goals and objectives and targeted stakeholders.
- Promote appropriate and achievable research in freshwater and marine aquaculture, with emphasis on fresh water aquaculture to achieve short-medium term objectives.

Private sector should:

- Collaborate with government and participate in industry-institute partnership research.
- Provide feedback on problems in industry & identify research needs.
- Commit to mentorship programmes.

3.5.10 Technology transfer

The government should:

- Develop a timely, strategic approach for smarter disseminations of technological innovations domestically and abroad
- Establish an Aquaculture Extension arm within DAFF with well and appropriately trained and equipped extension personnel to facilitate technology transfer among farmer groups
- Undertake joint aquaculture research and development with the private sector to acquire high potential technology and its transfer
- Ensure that government funded knowledge is made accessible to the public

3.5.11 Extension and sector outreach services

Government should:

- Develop a programme to implement demand-led aquaculture extension programmes
- Establish and support national and regional aquaculture information networks in order to enhance outreach activities
- Support and encourage farmer associations to deliver extension messages
- Adopt an incentive scheme for hatchery and fry nursery operators and fry/fingerling traders who have developed good management practices to use them in government extension programmes

Aquaculture and fisher professional organisations should:

- Act as forum for information exchange among stakeholders.
- Rationalise the marketing and purchasing of inputs, as well as to exert social control on service suppliers.
- Defend the collective interests and lobby for appropriate interventions of the public sector.
- Take the lead in encouraging members to participate in institute-industry and participatory research.
- Encourage members to act as volunteers in extension work.

Private sector should:

- Support collection of required baseline information for setting outreach programmes and inform the details to the Government.
- Obtain all appropriate extension material from concerned governmental agencies and other organisations involved in aquaculture and prepare own extension material to disseminate among small-scale farmers.
- Inform Government of constraints and issues that they experience and seek solutions.

3.5.12 Aquatic animal health management

Government should:

- Develop a national strategy for fish health management for aquatic organisms. Such a programme must recognize that aquaculture is currently in its infancy and that on-farm and off farm bio security is key threat to the sector, particularly during national expanding phase of development. Government should assess the timing and need for developing a national strategy for a comprehensive aquatic animal health management programme
- Assure the protection of both cultivated and natural aquatic animal resources, clearly delineate the responsibilities of food and veterinary service agencies and natural resource agencies, and effectively address the coordination and harmonization of government policies and standards for import and export of both cultivated and wild aquatic animals
- Educate fish farmers on holistic fish health and fish health management

Private sector should:

- Private sector should develop own specific bio-security plan for aquaculture
- Be responsible for the management, prevention and control of the spread of diseases within and outside their farms.
- Report outbreaks of diseases to the appropriate authorities, particularly if they are notifiable diseases.
- Develop and practice a Code of conduct for good farm and husbandry management practices

3.5.13 Information systems

Government should:

- Ensure South Africa be the regional leader for the repository for global information and technology, using modern and traditional technologies for effective communication and dissemination
- Ensure functional an Aquaculture Information Unit (AIU) at DAFF to be the primary repository for South African aquaculture information and the conduit to provide FAO with statistical information on aquaculture

- Develop and implement a focused, relevant and cost effective stakeholder communication strategy incorporating appropriate material and an implementation timeline

3.5.14 Product quality, safety and diversification

The government should:

- Enhance intra-governmental cooperation (example between DoH and DAFF Veterinary services) to ensure all reasonable measures for safe food
- Develop practical and cost effective technologies to detect, assay and reduce toxins, contaminants, and residues in aquaculture products
- Ensure the availability of safe and effective therapeutants for use in aquaculture
- Assure safety and enhance quality of aquaculture products through innovative processing technologies and new product development recognizing the informal sector
- Work with the industry to indentify, develop and implement approaches to ensure that government health and safety responsibilities are fully met in a fair, practical and environmentally acceptable fashion
- Harmonize national and international inspection procedures and guidelines and ensure consistent interpretation and implementation

3.5.15 Gender, youth and disability

Government should:

- Promote meaningful participation of youth, women and people with disabilities in aquaculture.
- Develop a strategy to incorporate more women, youth and people with disability in aquaculture practices, processing and marketing of aquaculture products
- Facilitate partnership between private sector and government in capacity building for women, youth and disability to undertake viable aquaculture enterprises

Private sector should:

- Develop capacity building for women groups to undertake viable aquaculture methods to ensure gender equality.
- Take the lead in specific funding programmes/ incentives between government and private sector to benefit women, youth and people with disabilities.

3.5.16 Marketing and trade

Government should:

- Develop new domestic, regional and international markets, including specialty markets, import replacement, and export development. Product diversity can be maintained and specialty and value-added markets can be targeted as well as replacement markets in areas of seasonal decline
- Focus on strengthening regional and continental trade in view of the competitive nature of western markets
- Consider its strengths in the regional market place to promote South African expertise and technology
- Improve marketing education for producers, processors, and consumers related to characteristics and handling of aquaculture and seafood products
- Create a significant market opportunity for private aquaculture in the sale of products to State and for export, for enhancement of natural stocks, mitigation, and sport fisheries.
- Resolve international trade barriers, including artificial barriers. Foster harmonization of national and international policies and regulations for trade in aquatic products
- Enable access to information on fish wholesale and retail prices and fish feed ingredient prices from main domestic and international markets to aquaculture farmers, processors and fish feed manufacturers
- Protect local producers against unfair foreign trade competition provided that the protective measures conform to international agreement

Private sector should

- Collaborate with government to mobilize farmers to produce according to the market demand.

- Circulate the information of the market needs.

3.5.17 Monitoring, control and evaluation of aquaculture sector

Government should:

- Establish and implement a monitoring and evaluation system that provides information on government targets and progress on its aquaculture development strategy and enable fine tuning and direct measures to overcome shortfalls, if any
- Improve coordination and efficiency of data-collection efforts among agencies, to expand the statistical database for aquaculture, and to improve assessment and reporting of the economic and environmental management of aquaculture to inform NASF
- Manage expansion of aquaculture establishment through a pragmatic licensing system.

Private sector should:

- Respect regulations on the responsible conduct of aquaculture and their obligations towards ensuring a healthy farming environment taking due regard of other users of resources.
- Practice codes of good management practices and individually and collectively promote voluntary self-regulation.
- Regularly provide reliable and up to date statistics on their operations under licensing obligations.
- Endeavour to ensure quality standards set by Government for aquaculture inputs and products are adhered to.

3.6 Operationalisation of the NASF

- This aquaculture strategy represents the framework for addressing complex and multifaceted issues associated with aquaculture in SA and targets the removal of constraints impeding the development and growth of the sector.
- This Framework will be used to develop time-bound action plans.
- The Government shall allocate the necessary administrative capacity and appropriate funding for effective communication, implementation, review and update of NASF.
- The operationalisation of the strategy will be driven by the inter-departmental Aquaculture Development Task Team (ADTT) in consultation with relevant external expertise to guide the process and public private sector development initiatives.

- The NASF will be communicated to government on all levels, with particular reference to specific government departments at national provincial and municipal level that are mandated to manage the development and regulation of the aquaculture sector.
- The NASF and its implementation will be reviewed on an annual basis to ensure that sector development is on track..

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