

OPERATION PHAKISA

Unlocking the Oceans Economy through Aquaculture

Department of Agriculture,
Forestry and Fisheries

Aquaculture Year Four Review

OCTOBER
2014 – 2018



agriculture,
forestry & fisheries

Department:
Agriculture, Forestry and Fisheries
REPUBLIC OF SOUTH AFRICA



environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA





Gallo Mussel processing plant



Roe of cultured local sea urchin



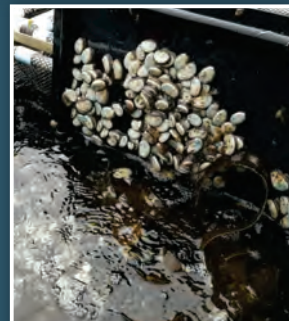
Ocean trout - Saldanha



Grow out facilities for Catfish farming at Karoo Catch in Graaf Reniet



Farmer holding abalone



Abalone in basket



Oysters Cleaning, Saldanha Bay

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1. ANNUAL REVIEW: OPERATION PHAKISA OCEAN'S ECONOMY: AQUACULTURE

1.1 ABBREVIATIONS

AASA	Aquaculture Association of Southern Africa
ADEP	Aquaculture Development and Enhancement Programme
ADF	Aquaculture Development Fund
ADZ	Aquaculture Development Zone
BEE	Black Economic Empowerment
BBBEE	Broad Based Black Economic Empowerment
CASP	Comprehensive Agricultural Support Programme
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
DFI	Development Funding Institutions
DCS	Department of Correctional Services
DHET	Department of Higher Education and Training
DPME	Department of Planning, Monitoring and Evaluation
DTI	Department of Trade and Industry
EC	Eastern Cape
ECDC	Eastern Cape Development Corporation
ECRDA	Eastern Cape Rural Development Agency
EIA	Environmental Impact Assessment
EU	European Union
FAO	Food and Agriculture Organisation
GDA	General Discharge Authorisation
GDP	Gross Domestic Product

GP	Gauteng Province
GTAC	Government Technical Advisory Centre
HACCP	Hazard Analysis and Critical Control Points
HDI	Historically Disadvantaged Individuals
IAC	Inter-departmental Authorisations Committee
IDC	Industrial Development Corporation
KZN	KwaZulu-Natal
MAFISA	Micro Agricultural Financial Institutions of South Africa
MOU	Memorandum of Understanding
NC	Northern Cape
NEPAD	New Partnership for African's Development
NRCS	National Regulator for Compulsory Specifications
SA	South Africa
SADC	Southern African Development Community
SAIMI	South African International Maritime Institute
SARS	South African Revenue Service
SEA	Strategic Environmental Assessment
SEDA	Small Enterprise Development Agency
SMMEs	Small, Medium and Micro-size Enterprises
TIA	Technology Innovation Agency
TNPA	Transnet National Ports Authority
WAS	World Aquaculture Society
WC	Western Cape

1.2 FOREWORD BY THE DIRECTOR-GENERAL: AGRICULTURE, FORESTRY AND FISHERIES AND DIRECTOR-GENERAL: ENVIRONMENTAL AFFAIRS



Mr Mike Mlangana
Director-General:
DAFF

It is a pleasure to present the 2017/18 Operation Phakisa: Oceans Economy Aquaculture Year Four Review. Since the launch of Operation Phakisa: Oceans Economy in 2014, the Department of Agriculture, Forestry and Fisheries (DAFF) as the lead on aquaculture development, along with key partners, such as Department of Environmental Affairs, have made important progress on the implementation of the aquaculture initiatives during the reporting period.

The number of Operation Phakisa projects has increased from 24 to 35. These projects have committed to meet the aquaculture aspirations which seeks to grow sector revenue to R3 billion; production by 20 000 tons; jobs from 2 227 to 15 000 and to increase participation to realise sector transformation.

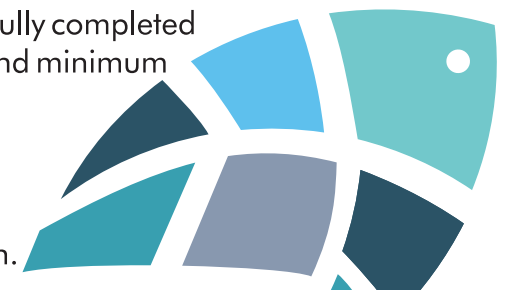
The highlights and challenges experienced during year four are adequately documented in this publication. One important highlight includes the implementation of Aquaculture Development Zones (ADZ's) incorporated as the ninth initiative under the Aquaculture Operation Phakisa programme. ADZ's are areas earmarked for aquaculture value chain activities with all the relevant authorisations in place and relevant basic infrastructure in order to reduce the cost of doing business. Zones were identified across the provinces and are at various stages of development.

In order to create an enabling legislative environment to promote sustainable aquaculture sector growth, the first dedicated aquaculture legislation, the Aquaculture Development Bill, was developed to address the current fragmented regulations and red tape. The Bill has gone through all relevant processes and public participation. It was approved by Cabinet on 9 May 2018 and introduced to Parliament on 15 June 2018 where it will undergo parliamentary processes.

To ensure access to local and international markets, frameworks and standards for food safety and animal health have been developed, approved and implemented. This includes a National Residue Programme for abalone, finfish and bivalves.

Under the Aquaculture Development Fund initiative, feasibility studies were successfully completed for ten (10) aquaculture species. Each study indicates the market, financial models and minimum scale required to inform new entrants, funding agencies, policy and investors.

Aquaculture requires critical skills and knowledge to ensure sustainability and profitability. In this regard, the department has entered into a Memorandum of Agreement with Stirling University to train and address local scarce skills in fish health.



Ms Nosipho Ngcaba
Director-General:
DEA

To date five (5) provincial veterinarians have completed one year of training and three (3) more are currently undergoing training. The development and approval of the aquaculture farmer qualifications framework was completed and led by AgriSETA.

The China-South Africa Agricultural Technology Demonstration Centre (ATDC) located near Gariep Dam in the Free State was officially handed over to South Africa in June 2017 and to date 236 potential farmers and government officials were trained and the aim is to broaden it to SADC countries. The demonstration centre offers key services which include extension and advisory services, and supplies fingerlings (catfish) to small scale projects in surrounding areas. It is also responsible for conducting research as well as training and public awareness activities.

South Africa's fish consumption is comparably low at around 8kg per person per annum versus the global average of 19kg per person per annum. In order to increase the consumption of fish locally, focus is placed on the development of a marketing and public awareness strategy, and the accessing of public sector markets through engagement with other government departments such as Correctional Services and Basic Education.

While good progress has been made, there are still critical challenges as we fall short of our aspirations. We would like to extend acknowledgement to sister departments, the aquaculture industry, sub-sector associations, project owners, the management team and staff for continued support and hard work in pursuit of developing a sustainable aquaculture sector. In order to positively contribute towards the development of our country, aquaculture seeks to continue enhancing food and nutrition security; job opportunities; economic growth and rural development.

Mr Mike Mlengana
Director-General: Agriculture, Forestry and Fisheries

Ms Nosipho Ngcaba
Director-General: Environmental Affairs



1.3 INTRODUCTION

Operation Phakisa (meaning 'hurry up' in Sesotho) was launched in July 2014, deriving the concept from Malaysia's Big Fast Results Methodology. It is a results-driven approach to development, setting clear plans and targets with on-going monitoring of progress; and making these results public in order to address the triple challenges of poverty, unemployment and inequality. It focusses on bringing key stakeholders from the public and private sectors, academia as well as civil society organisations together to collaborate in: detailed problem analysis; priority setting; intervention planning and delivery. The Department of Planning, Monitoring and Evaluation (DPME) leads Operation Phakisa. The Department of Environmental Affairs (DEA) has established the Oceans Economy Secretariat to lead the Oceans Economy.

The Operation Phakisa: Oceans Economy focuses on:

- Marine Transport and Manufacturing, led by the Department of Transport;
- Offshore Oil and Gas, led by the Department of Mineral Resources;
- Aquaculture, led by the Department of Agriculture, Forestry and Fisheries;
- Marine Protection Services and Ocean Governance, led by the Department of Environmental Affairs;
- Small Harbours Development, led by Department of Public Works; and
- Coastal and Marine Tourism, led by the Department of Tourism.

All initiatives are enabled by skills development and capacity building, led by the Department of Higher Education and Training (DHET), and research technology and innovation initiatives, led by the Department of Science and Technology (DST).

The Department of Agriculture, Forestry and Fisheries (DAFF) is the lead department for the Ocean's Economy Aquaculture focus area and its deliverables. The lab concluded that South Africa's aquaculture sector has a high growth potential due to an increasing demand of fish products due to the increasing global population; increasing income by the middle class in developing countries and more awareness on the dietary benefits offered by fish products. Moreover the capture fisheries yield has been plateauing over the past decade while aquaculture continues to grow over 7% per annum. This growth is expected to continue at a higher rate in the future.

The goal is to grow the aquaculture sector in South Africa to play a major role in supplying fish products; an enhanced role in job creation, increased contribution to national income and rural livelihoods. The targets over five years (2014-2019), seeks to grow sector revenue from R0, 67 billion to R3 billion; production by 20 000 tons; jobs from 2 227 to 15 000 and to ensure increased participation to support transformation in the sector.

The Aquaculture lab comprised of stakeholders from industry, government and academia who identified eight (8) key initiatives during the lab with one new initiative "Develop and Implement Aquaculture Development Zones (ADZ's)" added during 2018. 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 recently added initiative nine “Develop and Implement Aquaculture Development Zones (ADZ's)” seeks to promote investment into the sector and create an enabling environment.

To deliver these initiatives, the Aquaculture lab created detailed implementation plans and accompanying budgets, a proposed governance system to take responsibility for initiatives and key performance indicators to help monitor delivery.

The highlights outlined are consequences of the progress achieved on the 3 feet (ft) plans across the three horizons defined by the lab participants in 2014.

The previous Year One, Two and Three Annual Reviews are available online on the DAFF website: <https://www.daff.gov.za/daffweb3/Branches/Fisheries-Management/Aquaculture-and-Economic-Development/Operation-Phakisa>



1.4 PROGRESS ON AQUACULTURE KEY PERFORMANCE INDICATORS

It has been four years since the introduction of Operation Phakisa: Oceans Economy and considerable milestones were achieved to grow the aquaculture sector.

2018 LAB PROJECTIONS

During 2018 in the 3 ft plans, a total investment of R1.9 billion (Government and Private) since 2014 was required to unlock additional 1 300 direct jobs, 6 900 tons production capacity and increase turnover across the 35 projects to over R770 million per annum. The actual data will be collected and analysed during June 2019 and reporting will be reflected in the Year Five Review publication.



PRODUCTION 2017/2018

Phakisa projects contributed a total of **3 885.5 tons** production in 2017, of which **359 tons** were additional. This equates to an **11%** increase from 2016. The total production for marine and freshwater for the sector is **5 588 tons**. The production target set in the Phakisa Lab report for 2016/2017 was 10 000 tons, therefore in terms of the sector as a whole the production is **56%** on target.

2017 PROJECTED

6 500 additional tons production.



INVESTMENT

By end of 2017, total actual investment committed to Operation Phakisa Aquaculture Projects was over **R1.2 billion**, of which over **R260 million** was from government. The additional investment in 2017 was **R528 million**. This is **59.3%** of the projected additional **R890 million** target for 2017.

2017 PROJECTED

During 2017 as per the 3 ft plans an additional investment of **R890 million** (government and private) was projected



GDP 2017/2018

Total estimated turnover (based on tonnage) across **35 projects** amounted to over **R599 million** per annum in 2017. The total value of the aquaculture sector in 2017, was estimated at over **R982 million**. The abalone sector decreased in value by around R180 million from 2016, due to the Harmful Algal Bloom that occurred in 2017. It will take a while to recover.

2017 PROJECTED

The projected increased turnover from the baseline of **R500 million** is **R770 million** per annum across the **36 projects**.



TRANSFORMATION 2017/2018

Operation Phakisa project transformation statistics in 2017:

SMMEs = 16

Cooperatives = 1

Average BBBEE Level = < Level 4



JOBS 2017/2018

The total number of jobs contributed by Operation Phakisa projects was 2030, these included:

- **1 806**, previous total jobs on **30 farms** in 2016;
- **224**, new direct jobs created in 2017;

Disaggregated jobs (of total jobs on farm):

- **Gender:** Females (651) 32%
Males (1 379) 68%
- **Ages:** Youth (717) 35%
- **Race:** African black (1 119) 55%; Coloured (519) 26%;
White (159) 8%; Indian (1) 0%
- **Disabilities** (30) 1%
- **Veterans** (33) 2%

The total jobs for the sector were **4 862** (including the crocodile subsector and value chain jobs i.e. processing).

2017 PROJECTED

An additional **640** direct jobs.



1.5 HIGHLIGHT PER INITIATIVE

★ Quick wins

Priority initiatives identified by the aquaculture lab to support the implementation of catalyst projects

1★

Selection and Implementation of Catalyst Projects

Since the Lab in 2014, eighteen (18) new projects have been assessed and incorporated as part of Operation Phakisa Oceans Economy. In total there are thirty-five (35) projects. Twenty six (26) of the 35 projects are producing farmed aquaculture animals. Furthermore there are thirteen (13) new SMME projects accepted, subject to receiving water space in Saldanha Bay.

2

Legislative reform

Aquaculture Development Bill: approved by Cabinet on 9 May 2018 and was introduced to Parliament on 15 June 2018 and is under consideration by the National Assembly (during this reporting period).

Strategic Environmental Assessment: Specialist chapters have been undertaken for all the aquaculture areas identified (9 freshwater areas, 8 marine areas) through the SEA.

3★

Inter-departmental authorisations committee

Saldanha Bay Aquaculture Development Zone EIA: The Minister of DEA dismissed three of the appeals and upheld one appeal (regarding minor changes to the conditions) on the 7th of June 2018. Requirements to commence were met; this includes the appointment of an Environmental Control Officer, establishment of the Aquaculture Management Committee and Consultative Forum.

COEGA Aquaculture Development Zone EIA: On 7 February 2018, the Department of Environmental Affairs granted an integrated environmental authorisation for the development and operation of the Coega Land-Based ADZ in the Coega IDZ.

4

Globally recognised monitoring and certification system

- **Sea Urchin export:** A risk assessment was completed on cultured sea urchins for export purposes and testing of the sea urchin market is underway.
- **Development of National Residue Programme:** A National Residue Programme was developed and implemented for abalone, finfish and bivalve as per the European Union findings.

Regulations



5

Aquaculture development fund

- **Feasibility studies:** These were completed for marine finfish, oyster and mussels, tilapia, trout, abalone, catfish, freshwater ornamentals, marron crayfish and aquaponic systems to inform new entrants, funding agencies, policy and investors.
- **Business plan support** was provided through SEDA to projects requiring investment-ready business plans.
- **Investment Promotions:** Projects requiring investment were presented and profiled at five (5) investment conferences nationally and internationally.
- **ADF model implementation plan:** The ADF Working Group engaged with MAFISA (Micro Agricultural Financial Institutions of South Africa) to discuss funding for small scale farmer development and clustering.

Funding



6

Capacity building and skills development for support services

- The **skills and needs analysis assessment** of the sector has been completed to inform further interventions and skills requirements.
- **DAFF and Stirling University Agreement:** Five (5) provincial veterinarians have completed one year Masters training programme, two (2) DAFF staff members completed three months of training and three (3) new vets have been sent for another year of training in September 2018.
- **Aquaculture Farmer Qualification:** The aquaculture qualifications for 'Aquaculture Farmer' and 'Aquaculture Farm Assistant' have been completed and approved by QCTO (Quality Council for Trades and Occupations) in March 2018.
- **China-South Africa Agricultural Technology Demonstration Centre (ATDC):** 236 potential farmers and government officials were trained and the aim is to broaden it to SADC countries.

Skills



7

Coordinated industry-wide marketing efforts

DAFF facilitated the establishment of the African Chapter of the World Aquaculture Society (WAS). Chapter structures were formed and approved by WAS and is functional, this includes the Steering Committee, Interim Board and Secretariat which are all linked to the WAS Home Office (based in Louisiana, in the USA).

Market



8

Preferential Procurement

In order to access public sector markets and designate local fish products, baseline market information is required. Research on the current fish consumption of state owned entities and departments are currently underway. Initial engagement and information was shared from the Department of Correctional Services, South African Airways (Airchef) and the Department of Basic Education.

9

(NEW) Develop and Implement Aquaculture Development Zones (ADZ's)

To promote investment into the sector and create an enabling environment, the DAFF has embarked on a process to establish ADZ's. An ADZ is an area or site either on land or sea set aside exclusively for aquaculture use or development and may have bulk infrastructure (reservoir, water pump) to attract investors. There are currently seven (7) ADZ's registered and monitored under initiative 9.

1.6 YEAR FOUR REVIEW

OVERVIEW OF INITIATIVES

The nine aquaculture initiatives are divided into three phases in order to increase the scale of the aquaculture sector and identification of quick wins. This reporting period is based on phase three of implementation.

Phase 1: Implementation of initiatives in 6 to 12 months Quick wins

- 1a Implementation of 9 initial projects
- 3 Establishment of an Inter-Departmental Authorisations Committee
- 5 Establishment of an Aquaculture Development Fund
- 7 Coordination of industry-wide marketing efforts

Phase 2: Implementation of initiatives in 12 to 24 months

- 1b Implementation of 6 ready-to-operate projects and selection of additional projects
- 2 Legislative reform to promote Aquaculture development
- 4 Establishment of a globally recognised monitoring and certification system
- 6 Capacity building and skills development
- 8 Preferential Procurement of Aquaculture products

Phase 3: Implementation of initiatives in 2 to 4 years

- 1 Implementation of 12 ready-to-operate projects and selection of additional projects
- 6 Capacity building and skills development
- 9 Implement Aquaculture Development Zones

- ★ Initial short-term targets
- ✓ Completed
- ~ Underway



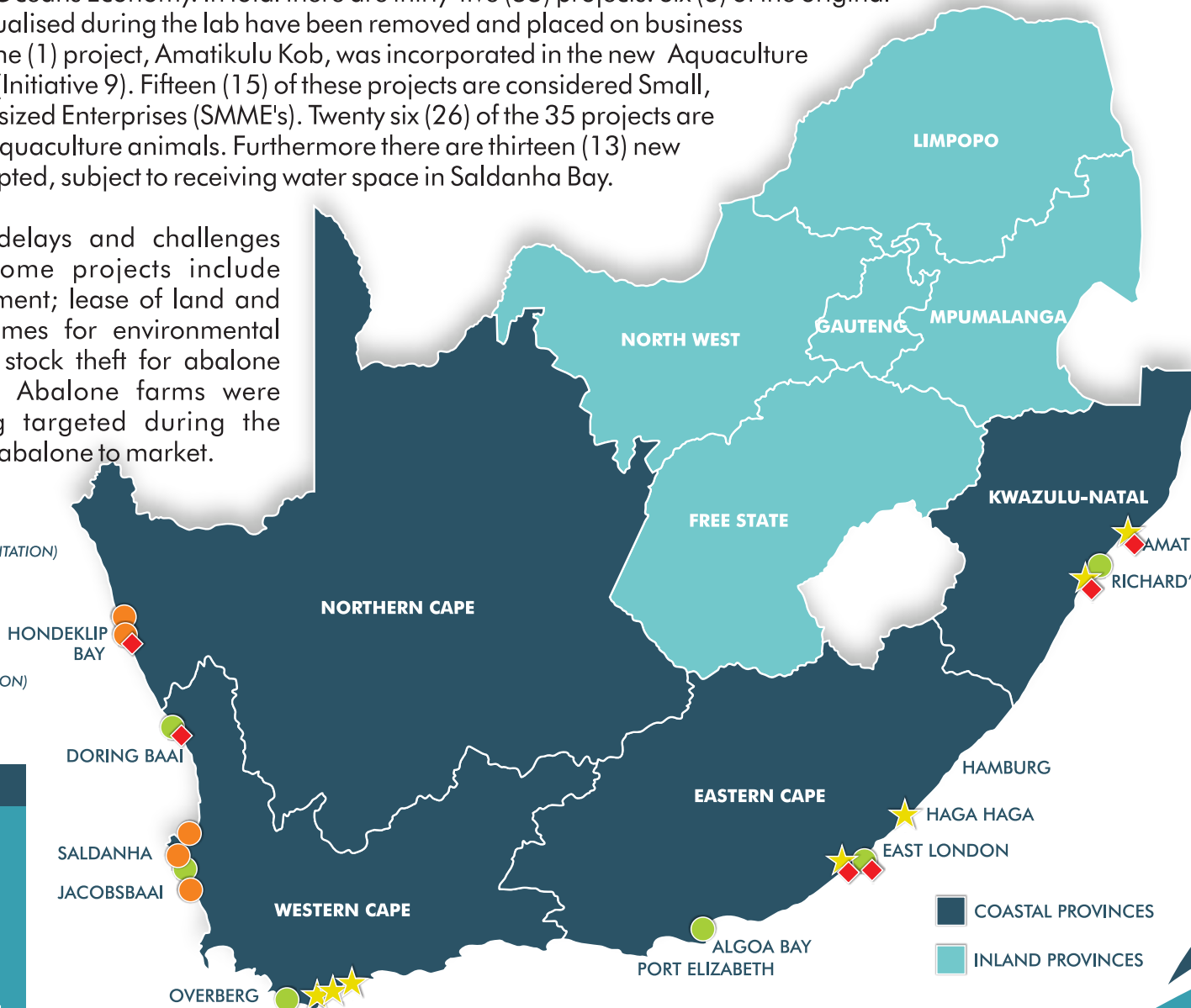
PROGRESS: INITIATIVE 1 - SELECTION AND IMPLEMENTATION OF CATALYST PROJECTS

Since the Lab in 2014, eighteen (18) new projects have been assessed and incorporated as part of Operation Phakisa Oceans Economy. In total there are thirty-five (35) projects. Six (6) of the original 24 projects conceptualised during the lab have been removed and placed on business opportunities and one (1) project, Amatikulu Kob, was incorporated in the new Aquaculture Development Zone (Initiative 9). Fifteen (15) of these projects are considered Small, Medium and Micro-sized Enterprises (SMME's). Twenty six (26) of the 35 projects are producing farmed aquaculture animals. Furthermore there are thirteen (13) new SMME projects accepted, subject to receiving water space in Saldanha Bay.

In summary, the delays and challenges experienced by some projects include funding and investment; lease of land and sea space; timeframes for environmental authorisations and stock theft for abalone ranching projects. Abalone farms were increasingly being targeted during the transport of farmed abalone to market.

- ★ PHASE 1 (6-12 MONTHS IMPLEMENTATION)
- PHASE 2 (12-24 MONTHS IMPLEMENTATION)
- PHASE 3 (2-4 YEARS IMPLEMENTATION)
- ◆ SMME'S (15+)

6 projects removed, placed onto business opportunities
 Ventersdorp Catfish, ADZ Ventersdorp, Algoa Bay Yellowtail, Oceanwise ELIDZ, Southern Atlantic, Paternoster Oyster, and Amatikulu ADZ removed to Initiative 9 (ADZ)



Map: 24 Original Aquaculture Projects

HONDEKLIP BAY

- New Farm: Diamond Coast Abalone Ranching (Abalone)
- ◆ Expansion of DST Abalone hatchery

DORING BAAI

- Expansion of Doring Bay Abalone

JACOBSBAAI

- Expansion: Jacobsbaai Sea Products (Abalone)

SALDANHA BAY

- New farm: Molapong Cages (Ocean Trout)
- Expansion of Blue Ocean Mussels
- Expansion of Saldanha Bay Oyster

RICHARD'S BAY

- ◆ New farm: Richard's Bay Sea Cage farming (Dusky kob)

AMATIKULU

- ★ Expansion of Amatikulu ornamentals

HAGA HAGA

- ★ Expansion: Wild Coast Abalone farm (Fish)

HAMBURG

- ★ Expansion of Hamburg Oyster farm
- ◆ New farm: Hamburg Kob

PORT ELIZABETH

- New Wild Coast Abalone ranching

OVERBERG

- ★ Expansion of Roman Bay (Abalone)
- ★ Expansion of Abagold (Abalone)
- Expansion of Marine Growers (Abalone)
- ★ Expansion of HIK Abalone



18 NEW AQUACULTURE PROJECTS SINCE 2014

KLEINZEE

- Expansion: Really Useful Investments (Abalone)

SALDANHA BAY

- Expansion: Blue Sapphire Pearls (Mussels)
- Expansion: Imbaza Mussels
- Expansion: African Olive Trading (Mussels)
- Expansion: Aqua Foods SA (Mussels & Oysters)
- New: Requa Mussels
- New: Chapmans Mussels
- New: Xesibe (Mussels)
- Expansion: Salmar Trading (Mussels & Oysters)
- New: Oystercatcher (Oysters)
- New: Southern Atlantic Sea farms (Mussels)
- Expansion: West Coast Oyster Growers (Mussels & Oysters)
- Expansion: West Coast Aqua (Mussels)

GAUTENG

- New: Northdene (Vaal Fisheries) tilapia

GRAAF RENIET

- Expansion: Karoo Catch (Cattfish)

COEGA

- RMS Abalone Farm

PORT ELIZABETH

- Expansion: Zwembesi (Oysters)

HERMANUS

- New: Hermanus Salmon

- ★ PHASE 1 (6-12 MONTHS IMPLEMENTATION)
- PHASE 2 (12-24 MONTHS IMPLEMENTATION)
- PHASE 3 (2-4 YEARS IMPLEMENTATION)
- ◆ SMME'S (15+)

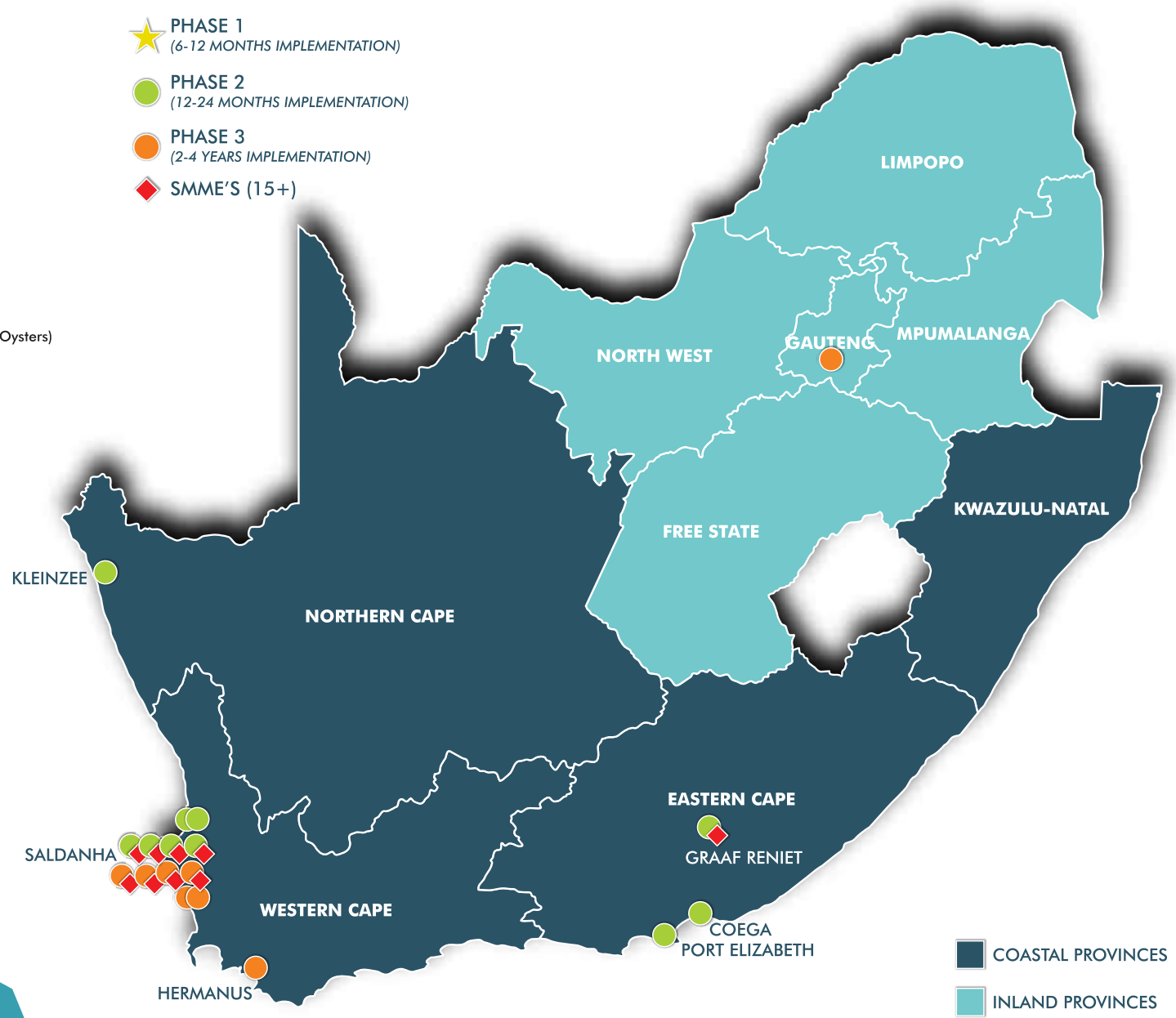


Table 1: Potential production and job creation by 2024 of the 14 new projects registered during 2018. One project (Relborg Management Systems) has been fully incorporated into the Operation Phakisa Aquaculture work stream and the other 13 will be fully incorporated based on their application for sea space.

PROJECT NAME	LOCATION		POTENTIAL PRODUCTION BY 2023/2024	POTENTIAL JOBS BY 2023/2024
Relborg Management Systems (RMS)	Port Elizabeth	EC (Abalone)	250 tons	445 jobs on farm
Lagoon Aquaculture	Saldanha Bay	WC (Mussel and oyster)	70 tons oysters and 600 tons mussels	80 jobs total (farm and processing)
Simunye Mussels (Pty)Ltd.	Saldanha Bay	WC (Mussel)	1 000 tons	13 jobs on farm
Golden Aquaculture	Saldanha Bay	WC (Mussel)	1 000 tons	13 jobs on farm
Mika growers (Pty)Ltd	Saldanha Bay	WC (Mussel)	1 000 tons	13 jobs on farm
Ulwazi Kukutya	Saldanha Bay	WC (Mussel)	1 000 tons	13 jobs on farm
Pluto mussels	Saldanha Bay	WC (Mussel)	1 000 tons	13 jobs on farm
BMI Enterprise	Saldanha Bay	WC (Mussel)	1 000 tons	13 jobs on farm
Mnyama Mussels	Saldanha Bay	WC (Mussel)	1 000 tons	13 jobs on farm
Maritime Agri	Saldanha Bay	WC (Mussel)	1 000 tons	13 jobs on farm
Saldanha Bay Sea Food Processor	Saldanha Bay	WC (Mussel)	1 000 tons	13 jobs on farm
Southern Atlantic Sea Food Holdings	Saldanha Bay	WC (Mussel)	1 000 tons	13 jobs on farm
Madima General Agriculture Trading	Saldanha Bay	WC (Mussel)	1 000 tons	13 jobs on farm
MMM Agriconsult	Saldanha Bay	WC (Mussel)	1 000 tons	13 jobs on farm
Total			12 920 tons	681 jobs



PROGRESS: INITIATIVE 2 - LEGISLATIVE REFORM TO PROMOTE AQUACULTURE DEVELOPMENT

Currently, the legislative framework governing aquaculture activities is fragmented and regulated by various departments as aquaculture occurs across sea, land and fresh water. Initiative 2 looks at `Legislative Reform` which aims to streamline the assortment of existing legislation in order to regulate and create an enabling environment to promote sustainable aquaculture sector growth.

Several steps have been taken towards the legislative reform to promote aquaculture development.

The Aquaculture Development Bill was approved by Cabinet on 9 May 2018 and is undergoing parliamentary processes. The Bill was introduced to Parliament on 15 June 2018 and is under consideration by the National Assembly, thereafter will proceed to National Council of Provinces.

Aquaculture Strategic Environmental Assessment (SEA):

The purposes of the SEA is to identify suitable areas where environmentally sustainable aquaculture development can be prioritised and incentivised. Secondly, it will provide a streamlined and integrated management and regulatory framework to reduce compliance complexities and improve decision-making processes. Suitable areas were screened and reviewed by key stakeholders through consultative workshops, see figure 1 below. To date specialist chapters have been undertaken for all the aquaculture areas identified (9 freshwater areas, 8 marine areas) through the SEA, however prior to going out for public comment, a workshop with authors and an Expert Reference Group (ERG) will take place to discuss issues raised by the expert review. Once the project is completed the areas deemed suitable for aquaculture development will require limited or no further environmental studies thus encouraging investment.

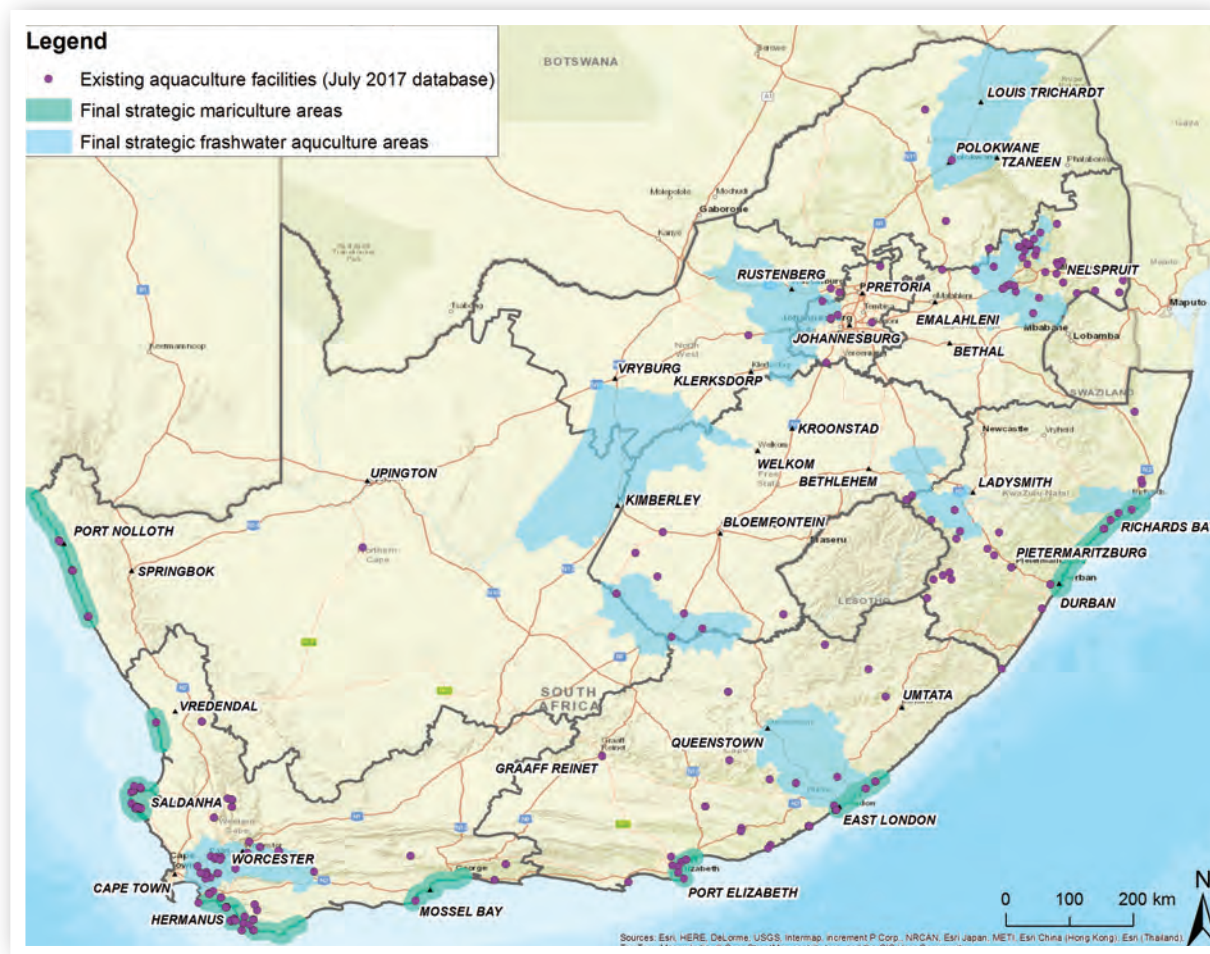


Figure 1: Freshwater and marine areas screened for aquaculture through the SEA



Coastal Discharge Permits:

The General Discharge Authorisation (GDA) for coastal discharges, which includes aquaculture, is aimed at reducing the need for aquaculture operations to apply for a full Coastal Water Discharge Permit which required various specialist studies. The project is delayed due to significant amendments completed to the draft GDA. The revised document need to be presented to relevant working groups and stakeholders, prior to gazetting for comment. To date the revised GDA conditions have been submitted to the Minister of Environmental Affairs to publish for comment.

Mapping and regulations of alien species:

In terms of Nile tilapia, a task team has been set up between industry, national government and the provinces; Nile tilapia and hybrids have to be sampled to determine risk areas for farming the species.

The Trout Mapping has not been finalised to date but the presence and absence of trout has been mapped per province. DEA has communicated regulatory implications of a state legal opinion that was sent to industry stakeholders. Revised regulations were published in February 2018 but this has subsequently been put on hold due to the legal challenge from the trout industry.

Norms and standards:

Norms and standards for abalone were gazetted for comment in February 2016 but will most likely be incorporated into the SEA process.

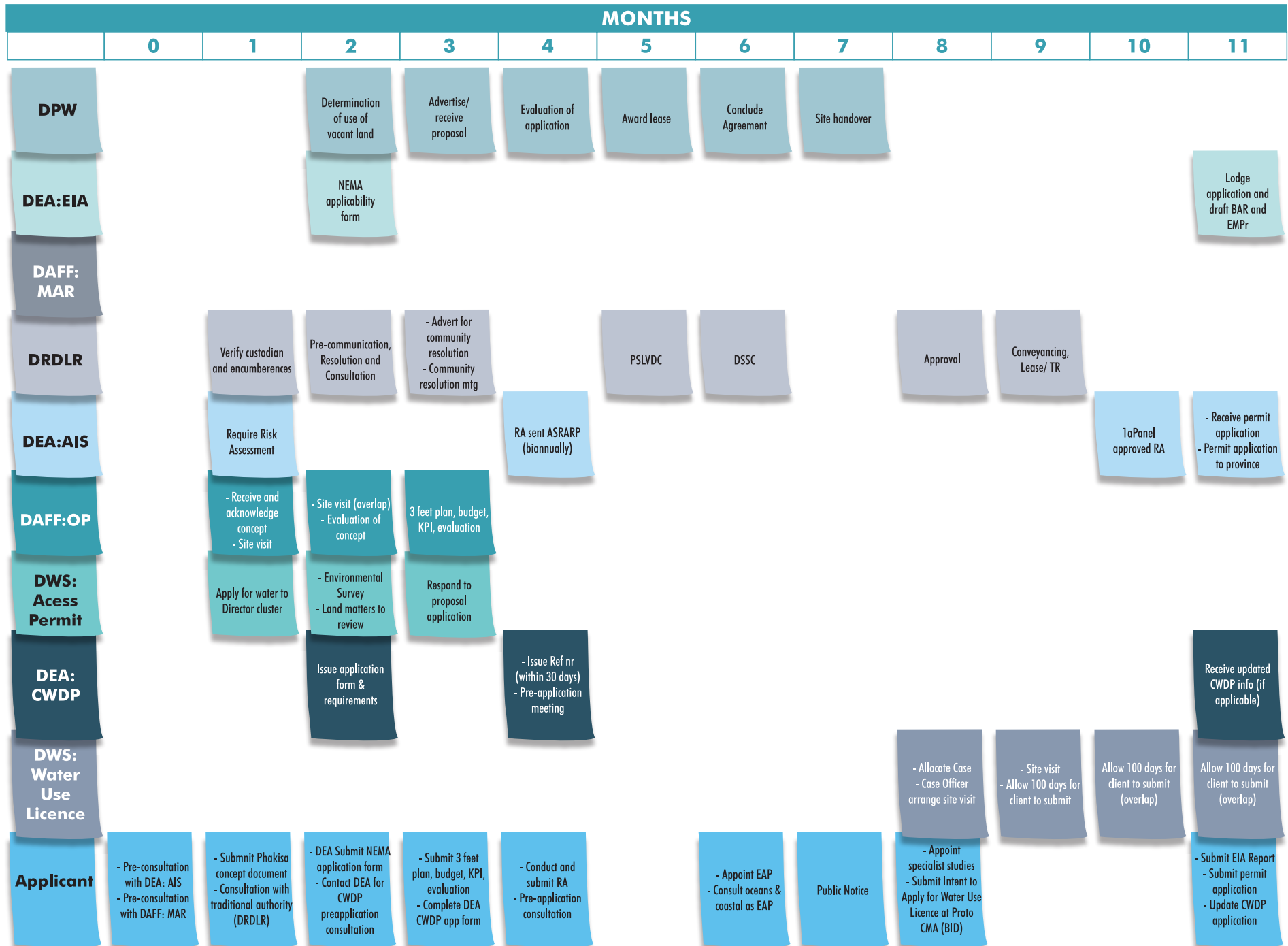
PROGRESS: INITIATIVE 3 - ESTABLISHMENT AN INTERDEPARTMENTAL AUTHORISATION COMMITTEE

Initiative 3 covers the establishment of an 'Inter-Departmental Authorisations Committee' (IAC) which will streamline and coordinate applications and approvals in the aquaculture sector. The IAC is made up of the following key member departments: Agriculture, Forestry and Fisheries, Public Works, Environmental Affairs, Rural Development and Land Reform, Water and Sanitation, Public Enterprises (Transnet National Ports Authority) and Mineral Resources.

The numerous authorisations required for aquaculture have been mapped in detail and recommendations have been made in terms of streamlining and further improving efficiency. The key outcome of streamlining aquaculture authorisations was the proposal to create a project management centre at the Department of Agriculture, Forestry & Fisheries (DAFF) to assist with planning and follow up of authorisations. This is partly implemented through the registration of projects with Operation Phakisa. A Memorandum of Co-operation would need to be signed by various departments to create a virtual 'One Stop Shop'.



MAPPING OF AUTHORISATIONS REQUIRED FOR AQUACULTURE



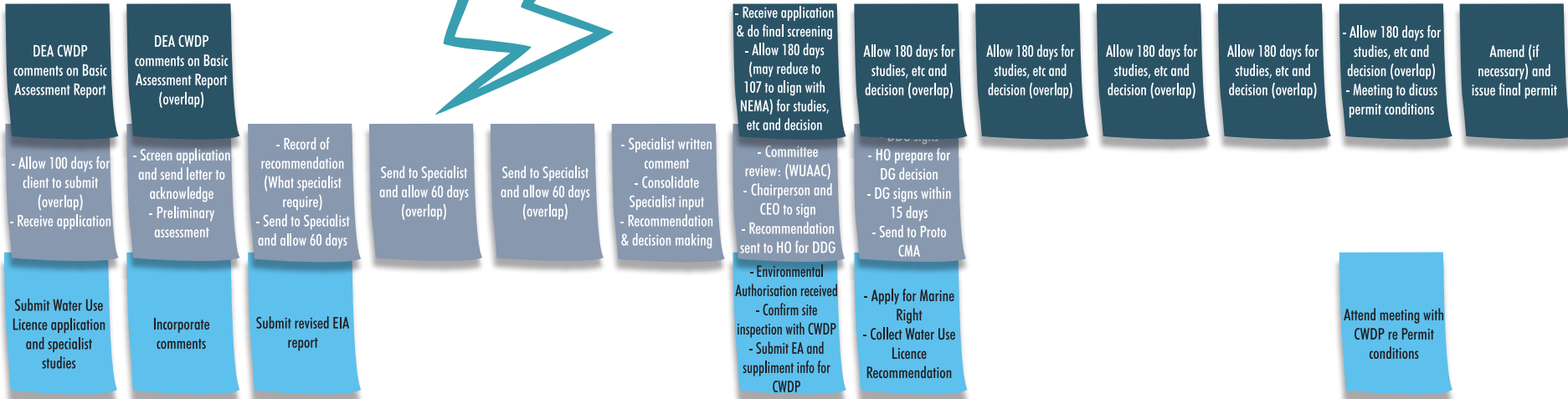
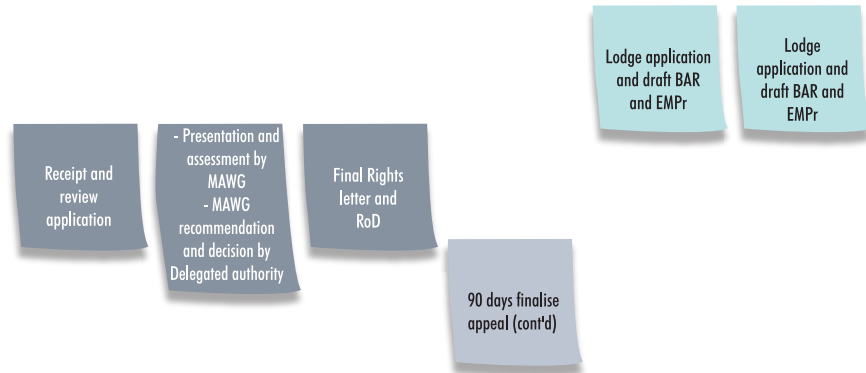
MONTHS

12	13	14	15	16	17	18	19	20	21	22	23	24
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ABBREVIATIONS

ASRRP	Alien Species Risk Analysis Review Panel	DWS: Access Permit	Department of Water and Sanitation: Access Permit
BAR	Basic Assessment Report	DWS: Water Use Licence	Department of Water and Sanitation: Access Permit: Water Use Licence
CEO	Chief Executive Officer	EA	Environmental Authorization
CMA	Catchment Management Agencies	EAP	Environmental Assessment Practitioner
CWDP	Coastal Water Discharge Permit	EIA	Environmental Impact Assessments
DAFF	Department of Agriculture, Forestry and Fisheries	EMPr	Environmental Management Programme
DAFF: MAR	Department of Agriculture, Forestry and Fisheries: Marine Aquaculture Right	HO	Head office
DAFF: OP	Department of Agriculture, Forestry and Fisheries: Operation Phakisa	KPI	Key Performance Indicators
DEA	Department of Environmental Affairs	MAWG	Marine Aquaculture Working Group
DEA: AIS	Department of Environmental Affairs: Alien and Invasive species	NEMA	National Environmental Management Act
DEA: CWDP	Department of Environment Affairs: Coastal Water Discharge Permit	Proto CMA	Local Catchment Management Agency
DEA: EIA	Department of Environmental Affairs: Environmental impact Assessment	PSLVDC	Provincial State Land Vesting and Disposal Committee
DG	Director-General	RA	Risk Assessment
DDG	Deputy Director-General	Ref nr	Reference Number
DPW	Department of Public Works	RoD	Record of Decision
DRDLR	Department of Rural Development and Land Reform	SUB	Need please
DSSC	Disposal Submission Screening Committee	TR	Transfer
		WUAAC	Water Use Authorisation Application Committee

- Province recommend permit
- Permit issued with conditions



Disclaimer: graphical representation to indicate interdependencies between authorisations required for aquaculture. Process depends on site and species and scale. IAC is busy improving timelines and interdependencies where applicable.

Environmental authorisations issued for Operation Phakisa projects since October 2014:

- Five (5) Environmental Impact Assessments (EIA) approved.
- Four (4) coastal discharge permits were issued.
- Four (4) biodiversity risk assessment (Barramundi, Coho, King Salmon and Sturgeon).
- Saldanha Bay Aquaculture Development Zone Environmental Impact Authorisation:
 - ✓ The Minister of Environmental Affairs approved the ADZ authorisation on 7 June 2018.
 - ✓ Saldanha Bay ADZ could potentially create between 780-2500 jobs, bring in additional investment of R400 million, unlock R800 million revenue per annum and contribute towards rural livelihoods and food security (import substitution).
 - ✓ Requirements to commence were met such as appointment of Environmental Control Officer, establishment of the Aquaculture Management Committee (AMC) and Consultative Forum.
 - ✓ DAFF and TNPA have engaged regularly around the allocation of new water space in Saldanha Bay in line with the revised area authorised in the EIA.
- Algoa Bay Aquaculture Development Zone:
 - ✓ Alternative sites are being assessed and considered.
- COEGA Aquaculture Development Zone:
 - ✓ On 7 February 2018 Department of Environmental Affairs (DEA) granted an integrated environmental authorisation for the development and operation of the Coega Land-Based ADZ in the Coega Industrial Development Zone (The intake and discharge pipeline is still undergoing EIA process).
- One new water lease was allocated and approved for an Operation Phakisa Aquaculture project in Port Elizabeth.
- Six (6) marine aquaculture permits/Rights were issued or amended.

PROGRESS: INITIATIVE 4 - ESTABLISHMENT OF A GLOBALLY RECOGNIZED MONITORING AND CERTIFICATION SYSTEM

Importing nations require assurances that the products they receive are safe for consumption, however, in South Africa there are currently only a few trained technicians and specialists. To address this, Initiative 4 is an enabler to establish a 'Globally Recognised Monitoring and Certification System' to boost exports of South African aquaculture products.

European Union (EU) export approval:

In order to access European Union (EU) export approval, a National Residue Programme was developed and implemented for abalone, finfish and bivalves. The EU additionally requires further capacity building of existing laboratories and a reference laboratory. To address this, DAFF is working with relevant departments and laboratories to set up memoranda of understanding (MOU) to validate laboratories and diagnostic tests.



Standards:

DAFF and National Regulator for Compulsory Specifications (NRCS) are working on Dried Abalone Standard.

Sea Urchin export:

A risk assessment was completed on cultured sea urchins for export purposes and testing of the sea urchin market is underway.

Standards and Compulsory Specifications to date:

STANDARD NO	NAME OF THE STANDARD	DATE PUBLISHED	ENTITY
No. R. 934	Compulsory Specification For Live Lobsters	19 August 2016	Department of Trade And Industry
No. R. 1329	Amendment of The Compulsory Specification for Canned Fish, Canned Marine Molluscs and Canned Crustaceans and Products Derived Therefrom	1 December 2017	Department of Trade And Industry
No. R. 870	Compulsory Specification for Aquacultured Live and Chilled Raw Bivalve Molluscs	10 August 2018	Department of Trade And Industry
No. R. 628	Amendment of The Compulsory Specification for Canned Fish, Canned Marine Molluscs and Canned Crustaceans and Products Derived Therefrom	22 June 2018	Department of Trade And Industry

PROGRESS: INITIATIVE 5 - ESTABLISHMENT OF AN AQUACULTURE DEVELOPMENT FUND (ADF)

Initiative 5, looks at the 'Aquaculture Development Fund,' which aims to establish an integrated pool of existing funds in order to finance all phases of aquaculture projects (including pre-production) and encourage new entrants to participate in the aquaculture sector.

The ADF Working Group is made up of the following key Development Funding Institutions (DFI's) and departments:

Agriculture, Forestry and Fisheries: Comprehensive Agriculture Support Programme (CASP) & Mafisa Fund; Industrial Development Corporation (IDC); Land Bank; Eastern Cape Development Corporation (ECDC); Eastern Cape Rural Development Agency (ECRDA); Science and Technology (DST); Jobs Fund; National Empowerment Fund (NEF); Trade and industry; Small Business Development (DSBD); National Treasury Government Technical Advisory Centre (GTAC); Small Enterprise Development Agency (SED); Wesgro (Tourism, Trade and Investment Promotion Agency for Cape Town and the Western Cape); Trade and Investment KZN (TIKZN).

ADF Model (implementation plan):

A submission and Memorandum of Cooperation (MOC) was approved by the DAFF DG and has been sent to the DFI's. In terms of ADF model implementation plan, DAFF met with the Technology Innovation Agency (TIA) and the Industrial Development Corporation (IDC) to present a proposal for focus review of new applications. The Working Group also engaged with Micro Agricultural Financial Institutions of South Africa (MAFISA) to discuss funding for small scale farmers development and clustering. An estimate budget was drafted for the development of clusters and submitted to MAFISA. During the



reporting period DAFF engaged with the Department of Small Business Development, Small Enterprise Development Agency (SEDA) and the Small Enterprise Finance Agency (SEFA) in January 2018 to see how the two departments can collaborate, with a focus on SMME's and co-operatives.

Aquaculture Species Feasibility Studies:

The financial feasibility studies were conducted on key aquaculture species and are guidelines to inform new entrants, government authorities and funders to assist with policy and investment decisions. Feasibility studies were completed for marine finfish, oyster and mussels, tilapia, trout, abalone, catfish, freshwater ornamentals, marron crayfish and aquaponic systems to inform new entrants, funding agencies, policy and investors. The feasibility studies include general economic models based on various production systems per species. The studies also indicate market assessments, minimum scale and financial analysis based on inputs from technical experts, industry stakeholders and peer-review workshops.

The feasibility studies and funding directory can be obtained from the links below:

Feasibility Studies: <https://www.daff.gov.za/daffweb3/Branches/Fisheries-Management/Aquaculture-and-Economic-Development/Aquaculture-Feasibility-Studies>

Funding Directory:

https://www.nda.agric.za/doaDev/sideMenu/fisheries/03_areasofwork/Aquaculture/economics/Funding%20Guide%202019%20Final.pdf

Investment Promotions:

The first round of investment readiness consultations were held with Saldanha Bay Operation Phakisa projects with Wesgro (Western Cape Trade and Investment Agency). It was noted many projects require assistance with detailed and audited business plans; this assistance is being supplied through SEDA. Business plan support was provided to African Olive Trading and Aquafoods through SEDA appointing service providers on 17 November 2017 and these were successfully concluded.

Projects requiring investment have been presented and profiled at investment conferences nationally and internationally.

These include:

- The dti and DAFF United Arab Emirates and Saudi Arabia Investment Mission (UAE and Saudi, March 2018).
- Operation Phakisa: Oceans Economy Italy Webinar (Pretoria, September 2018).
- Chile Scoping Mission with DAFF Deputy Minister: AquaSur International Conference (Puerto Montt, October 2018).
- The Presidential Investment Conference (Sandton, October 2018)
 - United Arab Emirates Agriscap Conference and Investment Mission (Abu Dhabi, October 2018).



PROGRESS: INITIATIVE 6 - CAPACITY AND SKILLS DEVELOPMENT

There is currently a lack of certified vocational training for basic aquaculture farming skills. In addition, aquaculture as an emerging sector has almost no dedicated and specialised extension officers; state vets specialised in aquaculture and research officers at a provincial level and at the national level within DAFF. Initiative 6 covers 'Capacity Building and Skills Development for Support Services'.

The skills and needs analysis assessment of the sector has been completed to inform further interventions and skills requirements. This was funded by AGRISETA and the National Skills Fund (DHET). The overview and recommendations are further outlined under section D. Skills and Capacity Building.

In order to address the scarce aquatic veterinarian skills and services available in South Africa, DAFF and Stirling University have signed an agreement for training of aquatic vets and aquaculture specialists. Five (5) provincial veterinarians have completed one year Masters training programme. Two DAFF staff members completed three months of training on fish health management. Three new vets have been sent for another year of training in September 2018.

Aquaculture qualifications (through AGRISETA):

The aquaculture qualifications for 'Aquaculture Farmer' and 'Aquaculture Farm Assistant' have been completed and approved by QCTO (Quality Council for Trades and Occupations) in March 2018. It is currently with SAQA (South African Qualifications Authority) for approval. The development and approval of the aquaculture farmer qualifications framework was completed in partnership with AgriSETA.

The China-South Africa Agricultural Technology Demonstration Centre (ATDC) is located near Gariep Dam in the Free State. Since this aquaculture training centre was officially handed over to South Africa, 236 potential farmers and government officials were trained and the aim is to broaden it to SADC countries. The species currently farmed at the demonstration centre includes common carp, African sharptooth catfish, koi carp, Mozambique tilapia and goldfish. The centre's service offering comprises of extension advisory services; supply of catfish fingerlings to small scale projects in surrounding areas; conducts ongoing research; provides various training courses and public awareness through school day visits and exhibitions at events.

PROGRESS: INITIATIVE 7 - COORDINATION FOR INDUSTRY WIDE MARKETING EFFORTS

Initiative 7 seeks to launch 'Coordinated Industry-Wide Marketing Efforts' to increase local consumption of aquaculture products and encourage the growth of small-scale farmers and new entrants. The coordination of industry wide marketing efforts is under way in order to streamline efforts and maximise resources.

African Chapter of the World Aquaculture Society (WAS):

Africa now joins the United States, Korea, Asia-Pacific, and Latin America and Caribbean as a fully-affiliated chapter of WAS. Forming the Africa chapter will provide the much-needed forum to address Africa's diverse and growing aquaculture sector. The chapter will increase exposure of aquaculture activities across the continent and provide opportunities for future collaborations. DAFF facilitated the Establishment of the African Chapter of the WAS. Chapter structures were formed and approved by WAS and have been functional, this includes the Steering Committee, Interim Board and Secretariat which are all linked to the WAS Home Office. The chapter is able to offer some technical activities and services to advance aquaculture development in the continent, in line to its overarching objective. The chapter is involved in AUDA-NEPAD



(African Union Development Agency) programme activities (e.g. aquaculture certification, Comprehensive Africa Agriculture Development Programme (CAADP), Aquaculture and the Blue Economy).

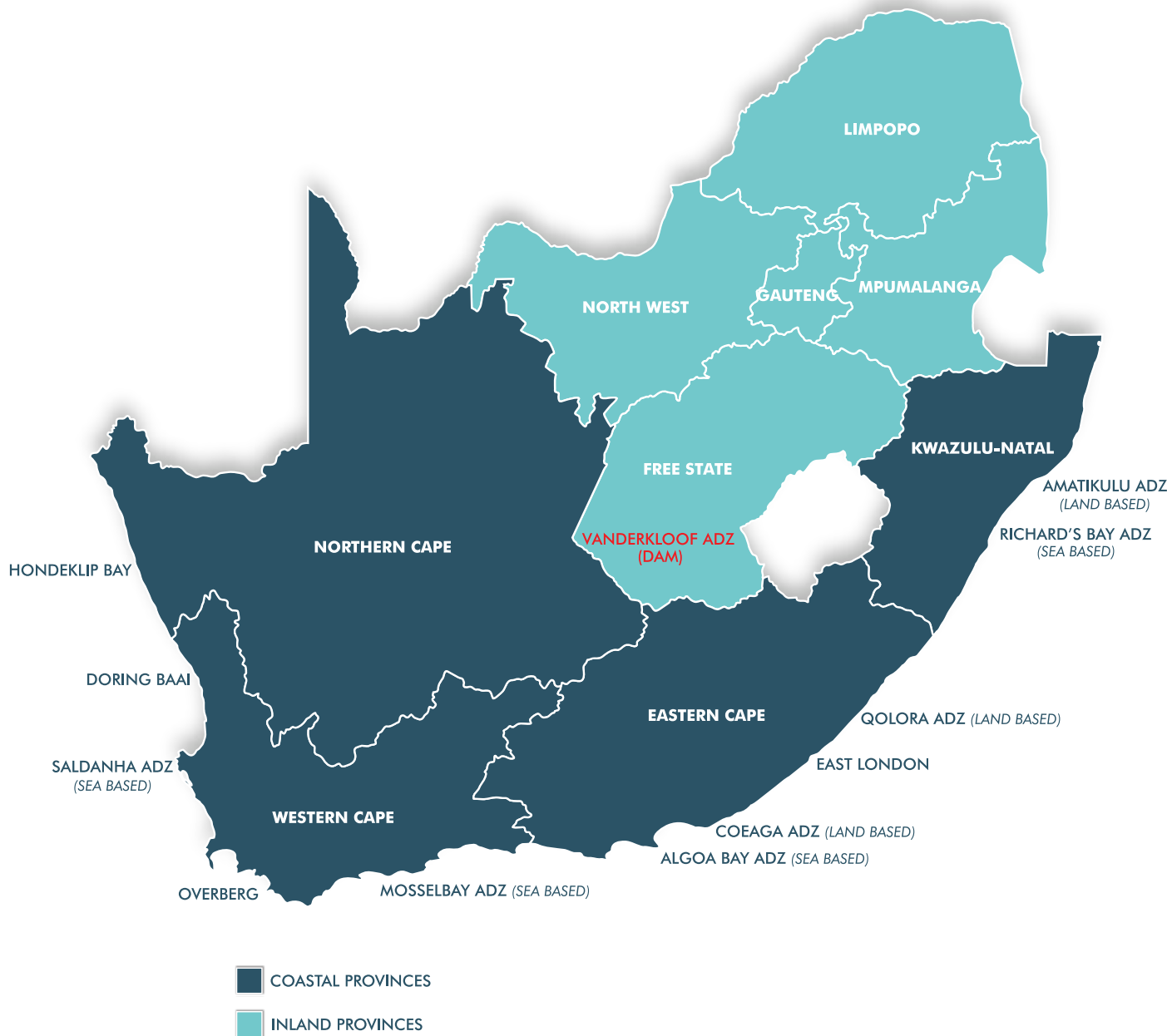
PROGRESS: INITIATIVE 8 - PREFERENTIAL PROCUREMENT OF AQUACULTURE PRODUCT

Preferential procurement can create local markets while contributing towards transformation and food security in South Africa. Initiative 8 is 'Preferential Procurement' which seeks to partner with government institutions to procure aquaculture products, thereby increasing local consumption and improving nutritional levels. The importance of investigating preferential procurement further was again highlighted in the financial feasibility studies conducted for various species. Research on the current fish consumption of state owned entities and departments are currently underway. Information has been received from Department of Correctional Services and South African Airways (Airchefs).

Engagement:

DAFF and Department of Correctional Services (DCS) met in March 2018 and a follow up meeting was planned in May 2018 with their supply chain management. Possible collaboration will be discussed as DCS's nutritional guidelines require procurement of fish which is not always available in all the provinces. Follow up meeting held with Deputy Commissioner on the 16 May 2018. Discussions are on ongoing. The Department of Basic Education (DBE) was engaged on the matter however there is less potential collaboration in the near future due to their requirements.





PROGRESS: INITIATIVE 9 (NEW) - DEVELOP AND IMPLEMENT AQUACULTURE DEVELOPMENT ZONES (ADZ's)

In order to promote investment into the sector and create an enabling environment, the DAFF has embarked on a process to establish ADZ's. An ADZ is an area or site either on land or sea set aside exclusively for aquaculture use or development and may have bulk infrastructure (reservoir, water pump) to attract investors. Such zones are supported by key government policies such as Industrial Policy Action Plan; Agricultural Policy Action Plan; Special Economic Zones (SEZ's) and the National Aquaculture Policy Framework. The Department of Agriculture, Forestry and Fisheries identifies suitable ADZ based on:

- Locational advantages of the site.
- Availability of quality water (freshwater or seawater).
- Carrying capacity of the ecosystem.
- Accessibility to markets (infrastructure and logistical).
- Potential socio-economic impacts (job creation, rural development, etc.).

The benefits of an ADZ include:

- Minimising the cost of obtaining Environmental Impact Assessments authorisation due to the economies of scale.



- Minimising the costs of infrastructure development (e.g. access roads, electricity, water intake and discharge).
- Easily coordinated support systems such as extension services, veterinary services, hatcheries, etc.
- Coordinated marketing.
- Associated benefits of agricultural zoning of the sites.
- Investment attraction.
- Job creation.

There are currently seven ADZ's registered and monitored under initiative nine:

1. Amatikulu Aquaculture Development Zone:

The Amatikulu ADZ is located in KwaZulu Natal approximately 130km from Durban and 7km from Amatikulu River. This land based zone has a targeted area of 108 Ha. The Environmental Impact Assessment (EIA) commenced in June 2017 and the scoping report was completed. The targeted species for the zone includes ornamentals, prawns; and marine and freshwater finfish. Currently only two hectares are utilised for ornamental fish farming.

2. Richards Bay Aquaculture Development Zone:

Richards Bay was identified as a site that may be suitable for marine aquaculture, specifically finfish cage culture due to sheltered nature and warm water temperatures. In 2014 during the Operation Phakisa lab, Richards Bay dusky kob cage culture was identified for establishment in Richards Bay Harbour. The project, known as the DST KZN Aquaculture Development Project is a collaborative undertaking between the Department of Science and Technology (DST), the DAFF and Stellenbosch University to determine the technical, environmental and financial feasibility of farming dusky kob (*Argyrosomus japonicus*) in sea cages in Richards Bay in KwaZulu-Natal. The pilot project involved the grow-out of a single batch of fish to a targeted weight of 1.5 kg. The project harvested over 20 tons of dusky kob at the end of June 2017. The DST KZN Aquaculture Development Project has since been concluded and the ADZ feasibility study has commenced.

3. Qolora Aquaculture Development Zone:

Qolora in the Eastern Cape had been earmarked for the development of an Aquaculture Development Zone. It is situated within the Wild Coast in the Eastern Cape Province, located approximately 2.6 km northeast of the Great Kei River mouth and ± 80 km northeast of East London. The site has an area of 26.4 Ha of land. An initial 200 ton abalone farm is proposed and will include community participation and beneficiation. Other targeted species include marine finfish and seaweed The ADZ requires funding for basic infrastructure as all authorisations were received.

4. Van der Kloof Aquaculture Development Zone: (trout)

The Vanderkloof dam is situated in the Northern Cape approximately 130 km upstream from Gariiep dam and is fed by the Orange River, which is South Africa's largest river. The aim is to negotiate and obtain consent from the land owners, custodians or government departments, undertake EIA processes where necessary and declare an ADZ. Vanderkloof dam has been identified as an ideal site for the declaration of an ADZ. The majority of permits have been received and the pilot has yet to commence.



5. Saldanha Bay Aquaculture Development Zone:

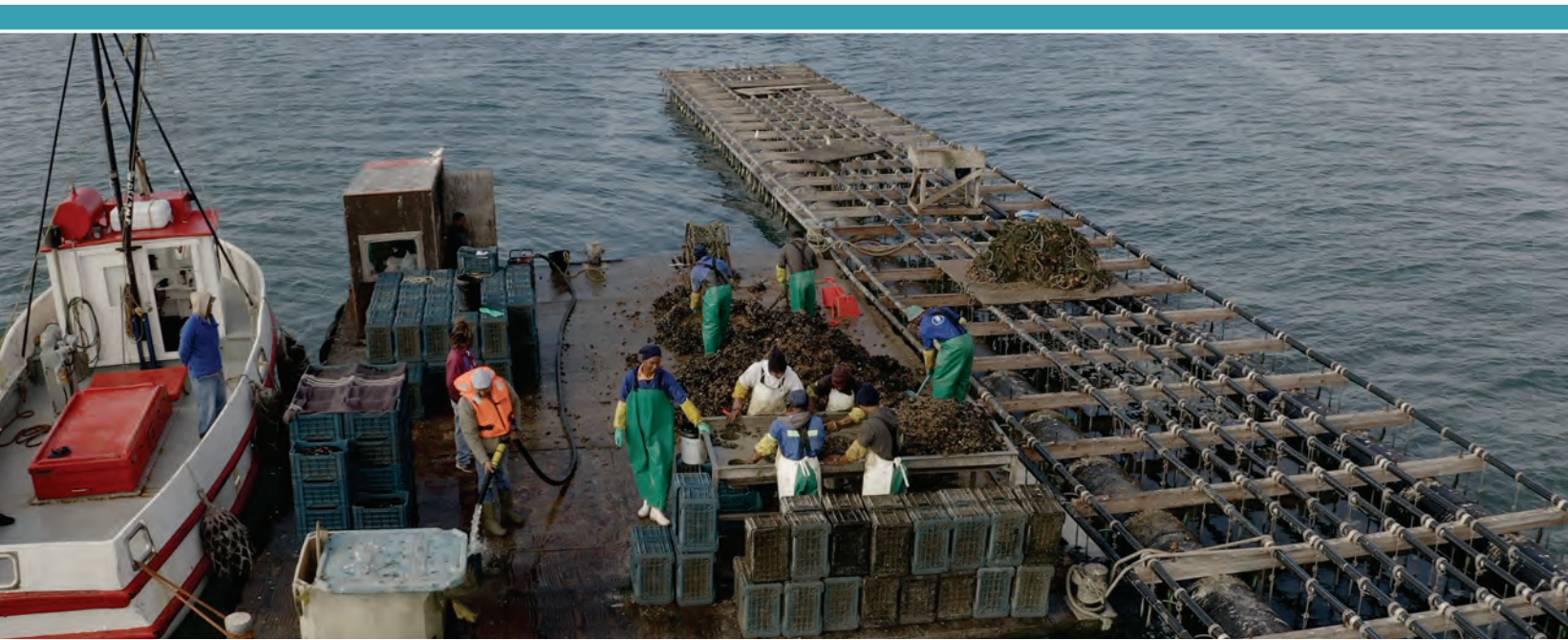
Refer to initiative three Interdepartmental Authorisations Committee for details. The ADZ has the potential to meet the Operation Phakisa production target, increase local employment in the area by unlocking up to 2 500 permanent direct jobs which can contribute up to 25% towards current local unemployment figures. It has the potential to increase investment into the area by over R400 million and the estimated direct revenue at full production could result to over R800 million per annum.

6. Coega Aquaculture Development Zone:

The Coega Development Corporation (CDC) is proposing the development of a land-based aquaculture development zone in Zone 10 of the Coega Special Economic Zone (SEZ), Port Elizabeth in the Eastern Cape. The intention of the Coega Aquaculture Development Zone will enable the Coega Development Corporation to provide an 'investment ready' platform for companies planning to set up commercial aquaculture operations in the Coega IDZ. An EIA was approved in February 2018 for the ADZ for Zone 10. Targeted species include marine and freshwater finfish and abalone. Based on the feedback received and technological development to reduce water exchange and consumptive water use, the CDC is also including intensive freshwater and brackish water aquaculture in the ADZ.

7. Mosselbay Aquaculture Development Zone:

Located in the Western Cape, this is a sea based ADZ. The target species are bivalves (mussels and oysters) and finfish however an EIA is planned for the zone and will determine the size, location and species best. An Environmental Assessment Practitioner needs to be appointed in order to undertake the EIA.



2. YEAR FOUR SNAPSHOT

Highlights from Operation Phakisa aquaculture projects and initiatives during the reporting period:


2.1. FEATURE 1: SALDANHA BAY AQUACULTURE DEVELOPMENT ZONE

Operation Phakisa Unlocks Aquaculture Potential in Saldanha Bay

The Minister of Agriculture, Forestry and Fisheries, Mr Senzeni Zokwana, welcomes the green light received on the proposed sea-based Aquaculture Development Zone (ADZ) in Saldanha Bay, Western Cape. The Minister of Environmental Affairs, Dr Edna Molewa, on 7 June 2018 dismissed the three appeals opposed to the authorisation issued on the 8 January 2018. The outcome enables sustainable aquaculture expansion in Saldanha Bay and the realisation of the aquaculture aspirations of Operation Phakisa: Ocean's Economy in terms of job creation, increased primary production, increased GDP contribution and inclusive growth of the sector.

Aquaculture has been practiced in Saldanha Bay since the 1980's and is considered as one of the primary locations for the culture of key commercial cold water species such as oysters, mussels and salmon. Previous studies indicate that one of the fundamental challenges in realising the potential of aquaculture in Saldanha Bay was the lack of an enabling regulatory environment. The Operation Phakisa: Ocean's Economy programme provided the platform to create this environment through increasing access to land and water space as well as improving access to markets and funding. As a result, there is significant interest from industry to expand current operations and to start new projects in the area. To date, fifteen (15) of the 35 registered Operation Phakisa aquaculture projects are located in Saldanha Bay with the majority of these marine aquaculture projects being small medium micro enterprises (SMME's) in the oyster and mussel subsector.

Minister Zokwana values the active participation of various Interested and Affected Parties (I&APs) in the area during the Environmental Impact Assessment (EIA) process. In line with the environmental authorisation received, key mitigation and management measures will be undertaken to alleviate any risks identified. One such measure is the establishment of an Aquaculture Management Committee (AMC) comprised of relevant government departments to oversee the management, monitoring and compliance of the environmental authorisation. To ensure transparency and accountability, the Consultative Forum (CF) will be established to create a platform for I&APs to engage with government departments and discuss environmental monitoring results.



At first, approximately 1 800 Ha of sea-space was earmarked for aquaculture development in the bay. However due to stakeholder inputs and other user needs, the initial area was reduced by over 50%. This equates to a total of 884 hectares which is approximately 10% of the bay. Interactions between users will be monitored continuously at the AMC and CF. Other mitigation measures include the placement of buffer areas around sensitive parts which include Marine Protected Areas, reefs, wrecks and sensitive visual receptors. In terms of increased aquaculture production, a precautionary and phased approach will be followed with regular monitoring. The extensive monitoring of the ADZ will be completed according to relevant international standards.

In conclusion, realising the full potential of the aquaculture in Saldanha Bay can go a long way towards alleviating poverty, empowering local communities and enhancing food security. The ADZ has the potential to meet the

Operation Phakisa production target, increase local employment in the area by unlocking up to 2 500 permanent direct jobs which can contribute up to 25% towards current local unemployment figures. It has the potential to increase investment into the area by over R400 million and the estimated direct revenue at full production could result to over R800 million per annum. In addition, increased local production can significantly assist with the substitution of seafood imports and therefore realise social and economic impacts on a municipal, regional and national level.

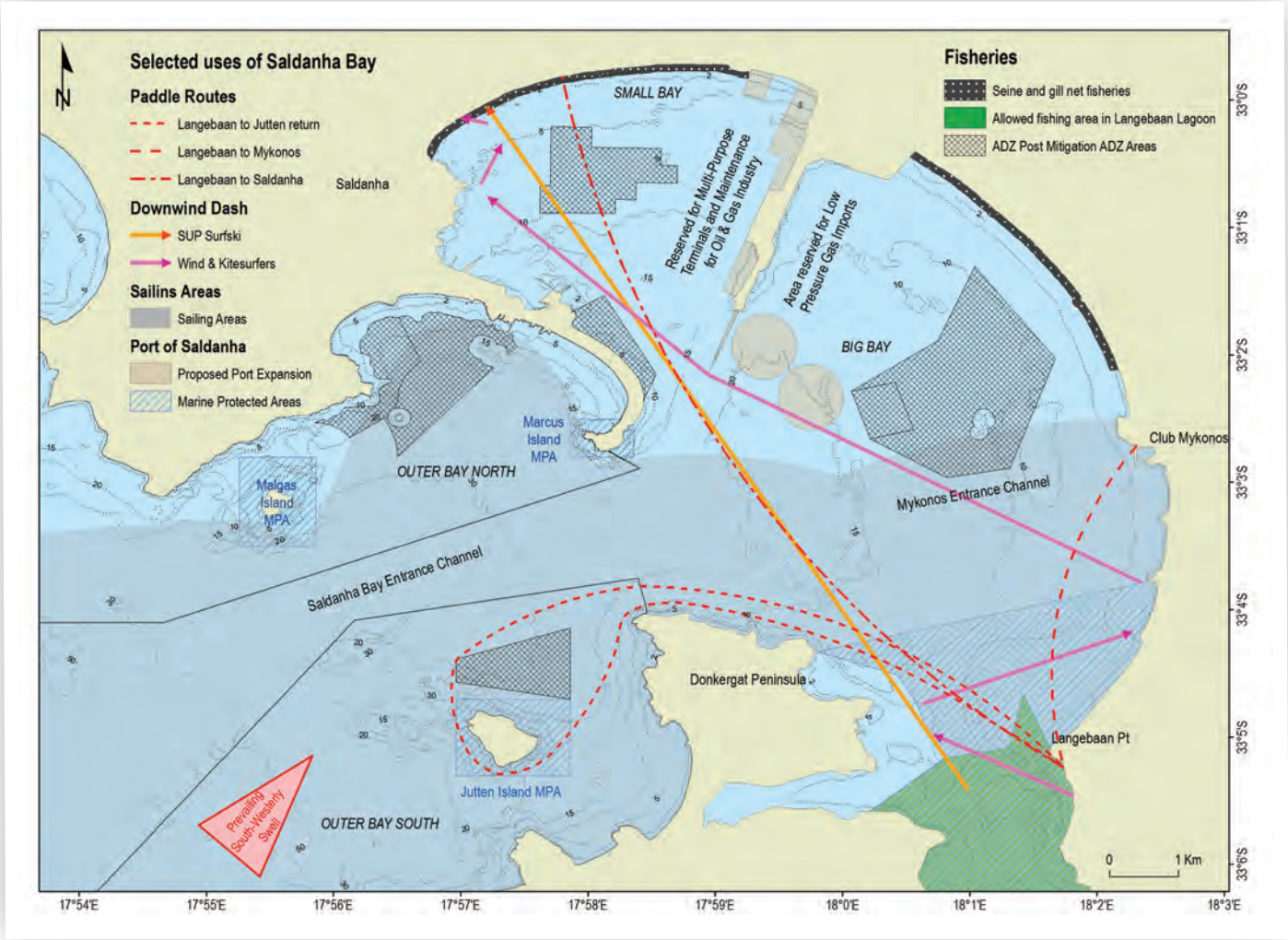


Figure 2: Saldanha Bay ADZ



2.2 FEATURE 2: FISH CONSUMPTION

“South Africa, a fish eating nation?”

The South African guidelines for healthy eating promote the daily consumption of fish due to its nutritional value but how much fish are South Africans really consuming? And with an ever increasing population how will we meet the future demand for fish? How do we ensure it's available, accessible and affordable to all?

Internationally, consumption of at least two portions of fish per week is promoted as part of a healthy diet due to its many nutritional benefits. Fish contains low fat, high-quality protein and it is packed with vitamins and nutrients that can help reduce heart attacks. The omega 3 fatty acids are beneficial to brain development and thought to decrease the risks of depression, Attention Deficit Hyperactivity Disorder (ADHD), diabetes as well as arthritis.

In reality, fish consumption in South Africa is estimated to be around 6-8kg per person per annum (per capita) which equates to less than one portion of 200g per week. This is considered very low compared to the global average consumption of 20kg per capita with countries like Japan as high as 50 kg of fish per capita.

While consumption of fish is promoted for health reasons, one needs to be cognisant of the fact that overfishing has placed strain on the world's wild fisheries and in the future, with growing world populations, additional fish demand will need to be sourced through aquaculture (fish farming). The Food and Agriculture Organisation of the United Nations estimates that nearly two thirds of the global fish supply by 2030 will be from farmed fish or seafood, at the same time an additional 50 million tons will be required to feed the world population. The local wild fishery sector is an important part of the nation's food supply, supports the livelihood of thousands of coastal communities and is an avenue for economic opportunities. It employs more than 27 000 people in the commercial sector and 7 000 people in the deep-sea trawling industry. The industry is valued at over R6 billion and earns more than R3, 4 billion in foreign exchange every year.

In order to maintain our food and nutrition security through this important sector and open new avenues of economic opportunities, job creation and inclusive growth, government is has prioritised developing the local aquaculture sector through its Operation Phakisa: Oceans Economy initiative.

Aquaculture (fish farming) involves breeding, rearing and harvesting finfish, shellfish and aquatic plants in aquaculture farms across the country. The Department of Agriculture Forestry and Fisheries promotes the growth of the sector in a sustainable manner. Over and above the potential socio-economic benefits of aquaculture, the sector can contribute towards reducing pressure on wild caught fish stocks and help rebuild stock of threatened or endangered species. To date there are 35 aquaculture projects around the country that have registered with our Operation Phakisa: Oceans Economy initiative and more aquaculture projects are in the pipeline. Since the launch of the initiative, more than R700 million has been invested into the aquaculture sector by government and the private sector.

Our investment into the aquaculture sector contributes significantly to our national goals of rapidly growing the economy and supporting socio-economic development. Opportunities in the aquaculture sector are supporting rural economic development for inland and coastal communities. It has started a cycle of economic activity, employment and consumer demand in these communities.



Government and relevant stakeholders in the sector are also unlocking growth of the sector through the allocation of land and water leases for aquaculture, creating enabling legislative environment, ensuring certification of product safety, opening up new local and international markets and building capacity to meet the growth of the sector. For example in order to address scarce skills on fish health, the DAFF has sent five state vets abroad to acquire an MSc degree in aquatic medicine in 2018.

Moreover, through these projects, government has also been hard at work to grow the contribution of small businesses which fulfil an important role of empowering people and drawing new entrants into the economy. Aquaculture is part of our bigger plan to tap into the economic and job creation potential of the Ocean's Economy whose industries are now diverse and on the rise. It includes marine transport and manufacturing; offshore oil and gas exploration; small harbours development; and coastal and marine tourism. The sustainable growth of these sectors is ensured through implementing a sound ocean governance framework.

We anticipate that by 2033 the oceans economy sector is estimated to have the potential to contribute up to R170 billion to the country's GDP and create more than one million jobs. Since its launch in 2014 it recorded steady gains and last year alone the sector attracted more than R25 billion in investment and created over 6 500 jobs. The development of the Ocean's Economy is part of government's commitment to move South Africa forward and address the triple challenge of poverty, unemployment and inequality.

To realise its full potential in job creation and economic growth in the sector, it will require all South Africans; the private sector, industry, civil society and academia to partner with government in rolling out our projects in communities across the country. Every citizen has an important role in helping us realise the country of our dreams. It requires each one of us to roll up our sleeves to build our nation and where possible lend a hand to bring others along on our journey. South Africans are encouraged to support and promote our various aquaculture projects around the country. The next time seafood is on the menu at your home or favourite restaurant, ensure it's locally caught or from one of our nations very own fish farms.



2.3 FEATURE 3: AQUACULTURE DEVELOPMENT BILL

Frequently Asked Questions around the Aquaculture Development Bill

The Department of Agriculture, Forestry and Fisheries (DAFF) has developed the Aquaculture Development Bill (the Bill). Aquaculture is a vast sector with a wide range of functions and applications and it requires a number of legislative measures to govern the sector. The Bill seeks to integrate and consolidate all legislative measures and consist of 14 chapters that clearly outline the objectives, functions and application of the Bill. The Bill aims to create a more enabling and developmental regulatory instrument for everyone who is active in the aquaculture sector, as well as individuals and entities aspiring to be active in the sector.

In order to understand the Bill, one should refer to chapter one (1) of the Bill which provides for the definitions of certain words and concepts used. The chapter also highlights the objects of the Bill and applies to all aquaculture activities in both marine and freshwater subsectors. A thorough legislative drafting process has been followed so far including obtaining legal opinion from the Office of the Chief State Law Advisor (OCSLA) and approval by Cabinet. To date, the Bill is undergoing Parliamentary processes. The current version of the Bill and an update on the progress thereof can be accessed from the Parliamentary Monitoring Group website: <https://pmg.org.za/bill/806/>

Here are frequently asked questions with regards to the Bill and the responses:

Question	Answer
Why is the Aquaculture Development Bill needed?	The Bill will provide, amongst other things, an enabling regulatory environment in order to promote sustainable growth and transformation of the aquaculture sector. Furthermore, the Bill seeks to promote development of the sector and thus contribute to government priorities of job creation, poverty eradication, ensuring food security and economic growth.
Will the Bill assist non-governmental organizations in terms of compensation due to natural disasters e.g. drought and exotic diseases?	The Bill will provide for compensation as per Section 14 (National Aquaculture Development Fund). The National Aquaculture Development Fund may be used for the purposes of funding or providing loans to projects and initiatives that promote responsible aquaculture development, including facilitating the entrance of historically disadvantaged individuals and communities and the youth into the sector. Furthermore it may also be used to fund aquaculture research aimed at the development of the sector and provide support services to the aquaculture sector.
Is it necessary to have 'Extension Officers because they will not be enforcing the law?	The role of extension officers is not to enforce the law but to render farmer support services which is critical in developing a sector as has been demonstrated internationally.

Question	Answer
What is the role of extension officers?	Extension officers are there to give support to farmers on technical aquaculture issues. Where possible, existing extension officers will be trained on aquaculture advisory and extension aspects.
Should farmers wait for the Act to come into effect before applying for licenses and how often will the Intergovernmental Authorisation Committee sit?	Farmers are required to apply for authorisations as per the applicable pieces of legislation currently in implementation until such time the Bill is signed into effect by the President of the country i.e. marine aquaculture farmers are required to apply for rights in terms of the Marine Living Resources Act, 1998. Meetings of the Intergovernmental Authorisation Committee shall be held every two (2) months and may be held more regularly depending on the need. The frequency of the meetings is stipulated in the Terms of Reference developed in terms of section 5 of the Bill.
Why were the Aquaculture Development Zones (ADZ's) established before the implementation of the Aquaculture Development Bill?	There is a programme and strategy in place for the establishment of the ADZ's however the Bill will provide for proper legislation to implement and manage the ADZ's.
What is the implementation plan for the development of the Bill?	The development of the Bill is done in terms of the recommendations of the aquaculture lab of Operation Phakisa: Oceans Economy Programme. Furthermore, <i>Socio Economic Impact Assessment System</i> (SEIAS) report was drafted on the Bill. Finally, an implementation plan for the Bill will be developed once the Bill is enacted into an Act by the President.
What provision is made for existing marine rights and will that be replaced by licenses after the Act comes into place?	Yes, the existing rights will be replaced by a licence. Transitional arrangements will be made under the Act in terms of chapter 14 of the Bill.
Are small scale farmers also required to obtain licenses and permits to operate?	Yes, they will require a licence and also specific permits for certain activities may be required.
What is the difference between a permit and a license?	<p>A licence is defined as a long-term authorisation granting the applicant the right to undertake an aquaculture activity according to the conditions established by the regulating authority and valid for a period of 30 years.</p> <p>A permit is a short-term authorisation to undertake aquaculture-specific activities when a licence has been granted, such as harvesting of broodstock, which is subject to conditions. An aquaculture permit, under the Bill, is valid for a maximum period of up to 24 months.</p>

Question	Answer
Why do applications for licenses have to go to the Minister and not to Inter-governmental Committee?	The Minister is the licencing authority, however this function is delegated in terms of section 79 of the Bill, the applications will therefore be submitted to and processed by the Inter-departmental Authorisation Committee.
Will the current legislation not be overruled by the Act?	Reconciliation and harmonisation of legislation administered by DAFF will take place. However, certain sections/provisions of certain legislation currently in implementation will be repealed. Furthermore, in an event of any conflict between a provision of this Act and any other law, the provisions of this Act shall prevail in so far as the conflict concerns aquaculture.
Can one obtain a license as an association for different sites?	Yes. If the association is registered under the Companies Act 71 of 2008 or Non-profit Organisations Act or Co-Operatives Act No. 14 of 2005 or any other legislation.
Must the farmer obtain different permits if he is processing different products on the farm or will one permit cover everything?	One permit for cultured products will be required.
What is the scope or role that the veterinarians can play in the Bill? The delegations must be clear and training must occur.	This will be dealt with through the regulations. The Bill states that veterinarians will provide aquatic animal health services to the aquaculture sector through provincial departments (Section 55). The training of state veterinarians in aquatic animal health is currently underway and will continue even after the Bill is signed into effect.
How will the national reference laboratories engage the industry in terms of research and how this will be coordinated?	Through formal agreements between the DAFF and different reference laboratories as well as through separate agreements between the laboratories and industry.
Will ADEP run concurrently with Aquaculture Development Fund (ADF) once the Bill is implemented?	ADEP is a separate grant programme administered by the Department of Trade and Industry. However, the ADF as established by the Bill will be a legislated fund that will be used to cover the gaps by existing funds/programmes, where required.
What are the costs of permitting/licencing of the Bill? Will it increase my costs?	The costs related to permitting and licencing will differ based on the type of activity an application is made for. However in comparison to the current permitting fees, it is anticipated that the costs will be significantly lower considering that the Bill seeks to streamline the authorization process.



Question

What are the costs of implementing the Bill? Are all the support services (extension services, reference laboratories, etc.) not too expensive for the sector to cover?

Answer

The functions as outlined in the Bill are essential for the development of the sector. For example, provision of extension services will benefit registered, licenced and permit holding farmers, in particular those who cannot afford private services. The costs incurred by the farmers will be minimal as compared to the vital services that will be afforded to them. Certain provisions of the Bill are already implemented. As such, once legislated they will not be carrying any additional costs. Where practical, existing services and infrastructure will be used. Currently the Department is training existing provincial state veterinarians in aquatic animal health internationally to capacitate existing state resources. The Bill indicates the Minister “may” in many sections, such as establish a reference laboratory, so the section will only be enacted if and when required.

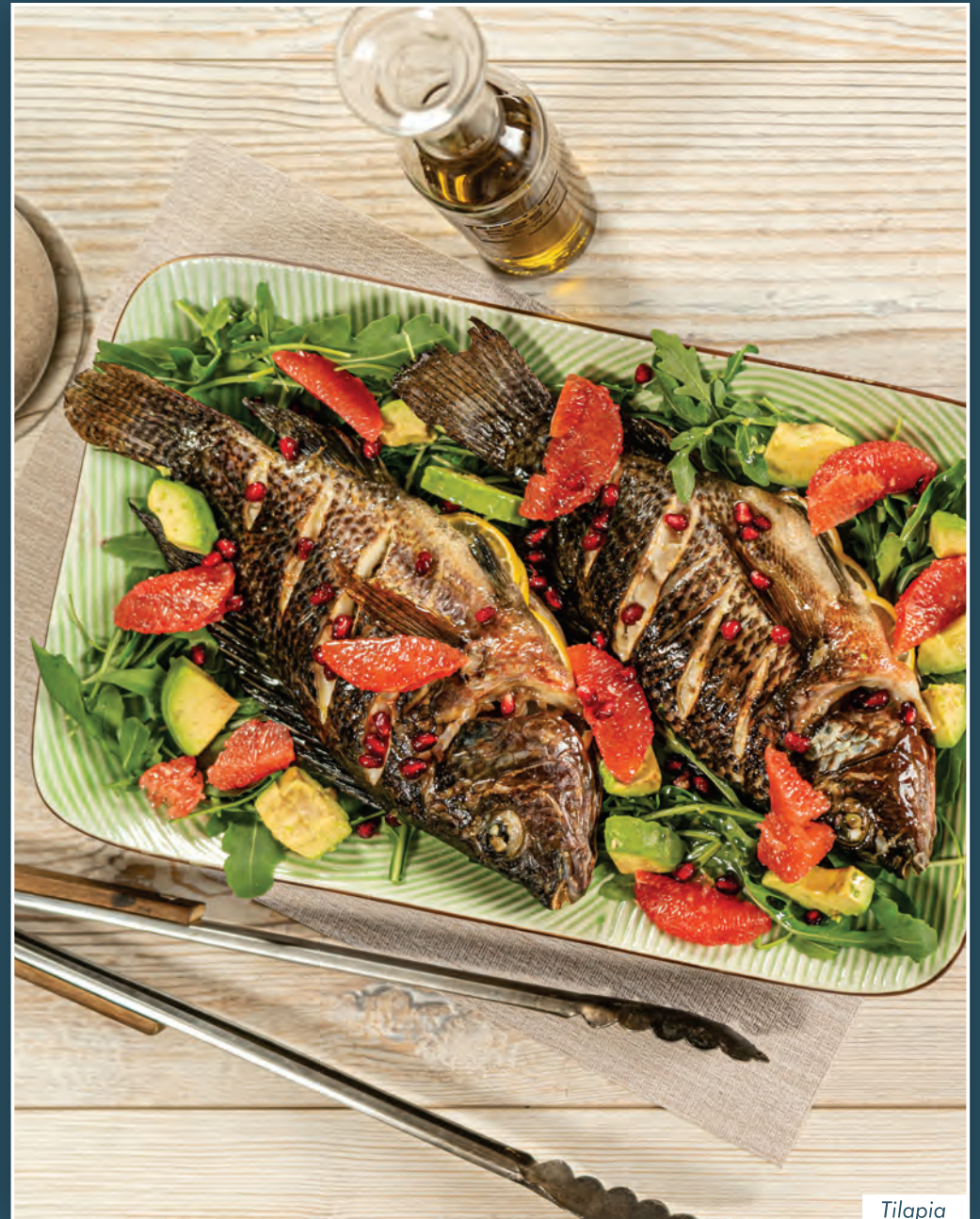




Fish bototie, catfish recipe



Trout



Tilapia

2.4 FEATURE 4: SKILLS AND CAREER DEVELOPMENT

1. Moving the Aquaculture Sector Forward through Skills Development

The aquaculture sector in South Africa is in its infancy and in order to develop it further, specialist skills are needed. During the Operation Phakisa: Oceans economy aquaculture lab process, stakeholders identified that industry requires additional specialised skills such as aquaculture extension officers, aquatic veterinarians and researchers in order to operate more efficiently and grow a sustainable sector.

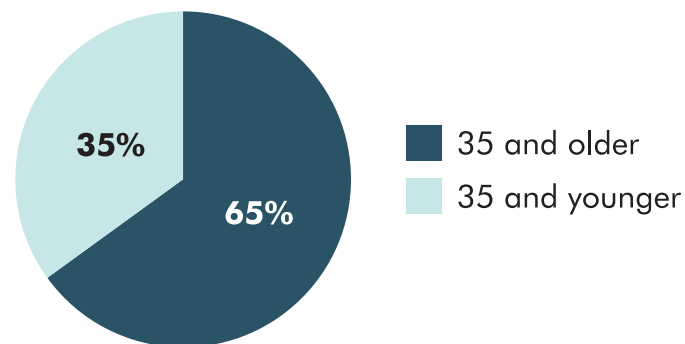
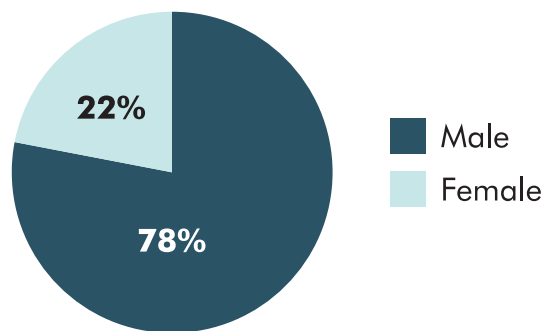
This led to the formation of the Aquaculture Skills Working Group which is comprised of various key government departments, government organisations, universities, training providers and industry. The Working Group is largely led by the South African International Maritime Institution (SAIMI) and the Department of Agriculture, Forestry and Fisheries (DAFF), however the Department of Higher Education (DHET), AgriSETA, Transport SETA and various universities and provincial organisations play a critical role.

To understand the exact requirements of the sector a thorough skills needs analysis was conducted, through the 'Skills Inventory and Needs Analysis' led by SAIMI and DAFF in 2017. These research efforts were aimed at identifying the shortfalls and future needs in skills, education and training as well as to unpack the current age representation and race participation. Data collection was conducted through interviews and focus groups. Both freshwater and marine farms producing species such as trout, tilapia, catfish, marron, crayfish, mussels, oysters, finfish and abalone were visited and studied. A total of 171 interviews were conducted across 16 farms. These interviews were done at all levels including aquaculture professionals, aquaculture farmers and farmer assistants. Below are the summarised outcomes of the Skills Inventory and Needs Analysis report, for further information please refer to the full report (SAIMI, Aquaculture Skills Inventory and Needs Analysis, 2017).

Demographics of the sector

Gender: Gender transformation has been slow as the sector still has a high percentage of male compared to female employees active in the industry.

Age: Around a third of the staff employed in the aquaculture sector is considered youth, aged 35 and younger.



Race: There is a high participation of Africans and Coloureds in entry positions such as 'Aquaculture Farm Assistants' and 'Aquaculture Farmers', however in the middle and senior management level namely, 'Aquaculture Farm Manager' is dominated by white employees. This indicates that it is important to ensure that youth, women and HDI's (Historically Disadvantaged Individuals) are given opportunity to grow in the sector and move into middle and senior management.

Skills and knowledge gaps

The skills needs analysis identified the following scarce skills:

- Veterinarians (aquaculture).
- System building (plumbing, electrical and welding).
- Hatchery skills: Broodstock selection, breeding, larval rearing.
- Quality assurance, food safety and HACCP.
- Technical divers or skippers.
- Feed manufacture.

In addition the following knowledge gaps were identified per occupation:


- Aquaculture Farm Managers – People skills (management, people skills)
- Aquaculture Farmer (Supervisors) – Supervisory skills
- Aquaculture Farm Assistant – understanding of whole operations of farms (not just own section)

Barriers of learning

Barriers addressed include the lack of finance, time and lack of education; lack of communication skills in the English language; aging professionals; lack of awareness on how to access aquaculture training courses; no opportunities to study and personal fears such as low self-esteem.

Recommendations

Based on the key findings from the study conducted, recommendations were made to deal with the specialised skills shortages and skills gaps. The recommended interventions are primarily based on education, training and skills development. Ten recommendations were suggested for both short term and long term implementation plans.

- 
1. **Adult Education and Training (AET):** This will address the literacy and numeracy levels of workers at all levels of the aquaculture sector. This is due to the large percentage of aquaculture assistants and farmers who have not completed formal schooling.
 2. **Accessibility to the aquaculture qualifications currently being developed:** It is recommended that the aquaculture qualification currently being developed be accessible to aquaculture farm assistants and farmers in the aquaculture industry.
 3. **Supervisory training:** Aquaculture farmers across all sectors of the industry have indicated a need for supervisory skills.
 4. **Management Interventions:** Managers across all sectors have indicated the need for management skills, with particular reference to people management and business management.

5. **Develop an aquaculture specific technical qualification:** It is recommended that the viability of developing a qualification or skills programme for aquaculture technicians be investigated.
6. **Aquaculture veterinary courses, qualifications or specialisation to be investigated:** Aquaculture veterinarians are scarce in South Africa. It is recommended that the possibility of including aquaculture specific training or courses be investigated as part of a veterinary science degree. (Refer to article on veterinarians that have been trained at Stirling University)
7. **Research funds for feed manufacturing:** Aquaculture specific feed manufacturing has been indicated as a scarce skill. Therefore is recommended that funds be made available for the research and development of feeds and feed manufacturing in South Africa.
8. **Short courses and skills programmes to be made available to organisations in the aquaculture industry:** Funding should be allocated for short courses and skills programmes needed by aquaculture farm assistants, farmers and managers.
9. **Make information available to organisations pertaining to SETA's and access to funding:** It is recommended that a document be circulated to all aquaculture organisations informing them of the skills development levy, joining an appropriate SETA mostly AgriSETA, learnerships and funding opportunities.

2. The Stirling University Vets Training Programme

Aquaculture in South Africa is a young but growing industry. It has been identified as a sector that will play a vital role in tackling global problems of food security and hunger. A sustainable aquaculture sector is a major priority and the government has put in place numerous initiatives to enhance this sector, the most recognisable one being the Operation Phakisa: Oceans Economy.

The Department of Agriculture, Forestry and Fisheries (DAFF) acknowledged that there is a shortage of specialised skills in the Fisheries sector in general. In the aquaculture industry, specialised skills such as aquatic vets, extension officers and researchers are scarce. This problem hinders the development of the sector. In dealing with this challenge the DAFF has a MOU with Stirling University to provide bursaries to individuals who will be trained and acquire the aquaculture expertise and apply them into this developing sector. The Stirling University Institute of Aquaculture is the largest of its kind. The faculty members are highly experienced as they work with governments; regulatory bodies; industry, pharmaceutical suppliers and fish farmers. As a global organisation they have links and partnerships with over 50 countries. Undergraduate courses are offered in Aquaculture BSc (honours) and Marine Biology BSc (honours). Postgraduate courses offered include sustainable aquaculture, aquatic food security, aquatic pathobiology and aquatic veterinary studies.

Since inception of the programme, 12 professionals from across provinces, both male and female have been awarded bursaries to enrol in the MSc aquatic veterinary studies and short courses. The aim is to have an efficient number of aquatic state vets, extension officers and researchers proactively operating in every province. This training programme will have an immense impact on the sector as it is directly dealing with skills shortages by equipping individuals with knowledge and will add much needed value to the aquaculture sector in South Africa.

Dr Chelopo Ngwako and Ms Primrose Lehubye are two aquaculture professionals who attended training at Stirling University. These two individuals responded to questions regarding their experience with the Stirling University training.

- **What is the one thing that you learnt at Stirling University that stood out for you?**

Ms Lehubye: The level or quality of education is exceptional. Their facilities (laboratories are technologically advanced to produce the best results. Another thing that stood out was the lecturers themselves, they were prepared and



gave their undivided attention to the students and ensured that each student is highly motivated to complete their studies.

5. **Develop an aquaculture specific technical qualification:** It is recommended that the viability of developing a qualification or skills programme for

▪ **How would you apply the knowledge acquired to the aquaculture sector in South Africa?**

Dr Ngwako: Adapt all skills and knowledge gained throughout the course within the South African aquaculture setting. If deemed fit make amendments to the current aquaculture setting to facilitate development/progress by government and industry.

▪ **There is a shortage of specialised skills in the aquaculture sector in South Africa, what would be your recommendation for the government and relevant stakeholders on addressing this issue?**

Dr Ngwako: The department has already taken initiative in this light by enrolling state veterinarians in the MSc Aquatic Studies programme at the University of Stirling. This will enhance aquaculture expertise in various parts of South Africa. In addition government and other institutions could avail more funding towards tertiary studies for careers in the aquaculture sector. Upcoming aquaculture farmers could receive training and guidance from local government and investors. The government can additionally strengthen ties with local tertiary institutions for continued professional development for professionals in the Fisheries divisions as well as embark on ways of absorbing new graduates.

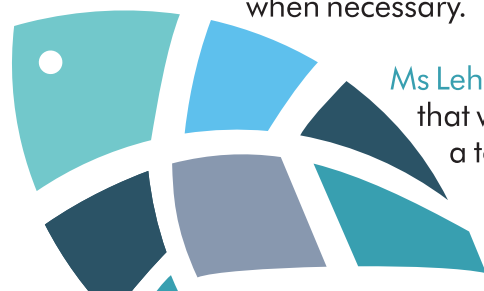
Ms Lehubye: In order to address this issue, the government needs to invest especially in aquatic animal health. There needs to be awareness campaigns especially in the rural areas where our fellow black people are unaware of this career. Information and bursaries needs to be provided to the marginalised communities to empower them which will in turn yield the desired results as there will be more veterinarians and aquatic animal health specialists in the country to manage aquatic animal diseases in the country.

▪ **How would you attract the youth into considering this field of study as a career to pursue?**

Dr Ngwako: It would require exposure of the youth to the 'aquaculture world' before they embark on tertiary studies so they are made aware of the array of opportunities available to them in the aquaculture sector. This can be achieved through the use of multimedia: it is far-reaching, immediate and engaging, helping them realise that a career in the aquaculture sector is accessible.

▪ **What are some of the challenges you encountered whilst studying Aquatic Veterinary studies/Animal health and how did you overcome these challenges?**

Dr Ngwako: Financial constraints and an effective study regime proved most challenging. To overcome the financial shortcomings I applied for a state bursary at DAFF and worked part-time to subsidise my monthly allowance by my bursar. In time I learned that each person has a unique way of retaining information; especially such dense information presented in veterinary school. I learnt to study at my own pace and seek help from my peers and lecturers when necessary.



Ms Lehubye: This course is only offered by two Universities in South Africa. Some of my challenges experienced as a technician is that we are not allowed scope for growth and that veterinarians will always dominate regardless of the experience one has as a technician. I overcame this challenge or rather still overcoming this challenge by ensuring that I empower myself through continuous learning. I am blessed in the sense that DAFF has invested in me by ensuring that I attend conferences and training that is specifically designed for veterinarians.

- Why did you choose to be a veterinarian/Animal health specialist

Dr Ngwako: It has been a childhood desire to work with animals and being a veterinarian seemed to be the best way to go about it. I find it to be one of the most effective ways to be impactful in society. The work encompasses interactions with people and animals from various socio-economic settings.

Ms Lehubye: I am passionate about the health and welfare of animals hence I opted to be in this field.

- What do you aim to achieve as a professional in the aquaculture industry in South Africa?

Dr Ngwako: My objective is to promote good animal welfare, health and biosecurity in all aquaculture establishments in the country.

Ms Lehubye: I am hoping to spread my wings and become the first aquatic animal health specialist one day and offer my services to the industry in order to grow this sector. I don't see myself becoming a veterinarian. I see myself becoming a Specialist Scientist in aquatic animal diseases.

- Aquaculture is a fairly new and developing industry in South Africa. Do you have any plans or ideas on how to uplift the aquaculture sector in South Africa and if so what are your plans or ideas?

Dr Ngwako: I am part of the Aquatic Animal Health unit under the Directorate of Sustainable Aquaculture Management (D: SAM). As a unit we are constantly re-evaluating approaches to aquaculture and maintaining an open dialogue with the industry and other institutions on how to best grow and promote the industry. Other units within the D: SAM shares a similar mandate; the collective effort will act as a springboard for the uplifted of the aquaculture sector. South Africa has untapped potential and the emergence and growth of the aquaculture industry will be coupled with increased food security, job creation and skills development for the country. South Africa will serve as benchmark for other developing countries with an interest in aquaculture, especially those on the African continent.



Ms Lehubye: To embark on my journey, I have recently started a research on polychaetes (worms). My aim is to acquire more knowledge regarding these worms that are infiltrating the aquaculture sector and to one day offer my expertise to the industry with regards to how to eradicate these worms that cause shell damage to abalone which affects their marketability.



3. ADVERTISEMENT: A CALL FOR NEW PROJECTS

The Department of Agriculture, Forestry and Fisheries hereby invite potential and new aquaculture project owners to register their projects to become part of Operation Phakisa: Unlocking the Economic Potential of South Africa's Oceans. Projects may be submitted any time however evaluations for inclusion will be conducted on a quarterly basis. Evaluation criteria are listed below or please refer to the Aquaculture Lab report and the link below.

The benefits of including your aquaculture project onto the Operation Phakisa programme:

- Contributing towards the Operation Phakisa aspirations in growing the sector, job creation, transformation and GDP contribution.
- Phakisa projects are prioritised and assistance is available with unblocking bottlenecks.
- Projects will be exposed to potential investors if funding is required.
- Projects will be profiled and presented at local and international events.
- Progress is monitored and reporting is publicly available to ensure transparency and accountability.

NO	CRITERIA	WEIGHT
1.	Marketing	30%
2.	Funding	15%
3.	Readiness for production	15%
4.	Scale	15%
5.	Technical Expertise	25%

BBBEE requirements on application:

- The minimum BBBEE required is level 4.
- 25% BBBEE ownership for existing projects.
- 50% BBBEE ownership for new projects (greenfields).

For more information on the criteria and application requirements, interested parties must refer to the New Projects folder available on the Operation Phakisa website: www.operationphakisa.gov.za/operations/oel/aquaculture/

All applications and enquiries can be forwarded to: Aquaculturephakisa@daff.gov.za or call Ms Bongive Gxilishe on 021 402 3322.





Mussel farming- Saldanha Bay



Market sized cultured sea urchins

AQUACULTURE OPERATION PHAKISA DELIVERY UNIT

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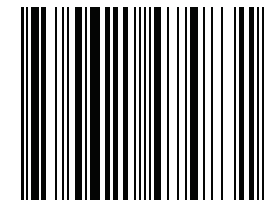
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