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YEAR SIX REVIEW

OPERATION PHAKISA

Unlocking the Oceans Economy through Aquaculture

October 2014-2020

forestry, fisheries & the environment
Department:
Forestry, Fisheries and the Environment
REPUBLIC OF SOUTH AFRICA

OPERATION PHAKISA

CONTENTS:

1.1 ABBREVIATIONS:

AASA	AQUACULTURE ASSOCIATION OF SOUTHERN AFRICA
ADEP	AQUACULTURE DEVELOPMENT AND ENHANCEMENT PROGRAMME
ADF	AQUACULTURE DEVELOPMENT FUND
ADZ	AQUACULTURE DEVELOPMENT ZONE
BBBEE	BROAD BASED BLACK ECONOMIC EMPOWERMENT
BEE	BLACK ECONOMIC EMPOWERMENT
CASP	COMPREHENSIVE AGRICULTURAL SUPPORT PROGRAMME
DALRRD	DEPARTMENT OF AGRICULTURE, LAND REFORM AND RURAL DEVELOPMENT
DFFE	DEPARTMENT OF FORESTRY, FISHERIES AND THE ENVIRONMENT
DFI	DEVELOPMENT FUNDING INSTITUTIONS
DHET	DEPARTMENT OF HIGHER EDUCATION AND TRAINING
DPME	DEPARTMENT OF PLANNING, MONITORING AND EVALUATION
DSI	DEPARTMENT OF SCIENCE AND INNOVATION
DTIC	DEPARTMENT OF TRADE, INDUSTRY AND COMPETITION
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
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 STANDARDS
NRF	NATIONAL RESEARCH FOUNDATION
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
TETA	TRANSPORT EDUCATION TRAINING AUTHORITY
TIA	GENERAL DISCHARGE AUTHORISATION
TNPA	TRANSNET NATIONAL PORTS AUTHORITY
WAS	WORLD AQUACULTURE SOCIETY
WC	WESTERN CAPE

FOREWORD BY THE DIRECTOR – GENERAL: FORESTRY, FISHERIES AND THE ENVIRONMENT

It is our pleasure to present the 2019/ 2020 Aquaculture Year Six Review publication. We have reached the six-year mark since the inception of the Operation Phakisa: Oceans Economy programme. This edition of the annual review was compiled right at the crossroad of starting the Master Plan process for the aquaculture sector and the COVID-19 pandemic which greatly affected all stakeholders.

According to the **dtic**, "The primary objective of the Master Plan process is to develop an agreed-upon set of actions, with time frames, that all stakeholders in a sector or value-chain commit to implementing for the benefit of the sector or value-chain. The objectives of the Master Plan include encouraging sector growth, investment, job creation and competitiveness." The Master Plan will help to accelerate the trajectory of the aquaculture sector alongside the implementation of Operation Phakisa, as we work towards the 2030 milestones set by the National Development Plan.

Collaboration was critical to achieving the progress on the nine aquaculture initiatives during the 2019/20 reporting period. The number of registered Operation Phakisa projects remained at 45, this indicates some stability against the unsettling effects brought on by COVID-19. The impact of COVID-19 on the abalone subsector is shown in the 'Year Six Snapshot' section of this review.

The development of enabling legislation is critical for the sustainable development of the sector. In this regard the Aquaculture Development Bill is being realigned according to the new departmental objectives.

The aquaculture sector is governed by numerous authorisations, therefore streamlining and ensuring efficiency is critical. During the reporting period it is notable that 19 new water leases were allocated and approved mainly towards new entrants in the Saldanha Bay Aquaculture Development Zone (ADZ) area.

Aquaculture is a knowledge and technology-driven sector that requires a diversity of skills. In this respect, the aquaculture qualifications for 'Aquaculture Farmer' and 'Aquaculture Farm Assistant' was completed and approved by the QCTO (Quality Council for Trades and Occupations) and SAQA (South African Qualifications Authority). The China – South Africa Aquaculture Technology Demonstration Centre (ATDC) located near Gariep Dam in the Free State trained 431 potential farmers and government officials to date. The aim is to broaden this training to Southern African Development Community (SADC) countries.

In an effort to improve market conditions brought on by COVID-19, the Standard Bank Group collaborated with the department to assist in providing new market access (especially for abalone). The exemption on sale of undersized-farmed abalone on the local market was approved with conditions on 8 September 2020. In order to promote investment into the sector and to create an enabling environment, the Algoa Bay ADZ was kick-started through the environmental authorisation issued on 26 January 2020. This ADZ in the Eastern Cape has the potential to create up to 2 800 jobs within the value chain once fully operational.

Along with the notable progress made, there are still critical challenges to be addressed to see the sector meet the initial aspirations set out in 2014. We would like to extend our utmost appreciation to sister departments, the aquaculture industry, sub-sector associations, project owners, academic colleagues, the management team and staff for the unwavering hard work in pursuit of developing a sustainable aquaculture sector.

Let us continue to pursue our collective efforts towards building an aquaculture sector that positively contributes towards enhancing food and nutrition security; job opportunities; transformation; economic growth and rural development.

Ms Nomfundo Tshabalala
Director-General: Forestry, Fisheries and the Environment

1.3 INTRODUCTION

Operation Phakisa is a fast results delivery programme launched in July 2014 to help implement the National Development Plan, with the ultimate goal of boosting economic growth and to create jobs. The National Development Plan (NDP) is South Africa's socio-economic development blueprint which enjoins us to create a better life for all citizens in an inclusive society. The NDP guides every sector's plans and policies; programmes; projects and operations – including how budgets, skills and other resources are allocated to move South Africa forward.

Operation Phakisa 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 leads Operation Phakisa. The Department of Forestry, Fisheries and the Environment (DFFE) established the Oceans Economy Secretariat to lead the 'Oceans Economy'.

The Operation Phakisa: Oceans Economy programme focuses on:

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

Each of the focus areas noted above are enabled by skills development and capacity building; as well as research, technology and innovation initiatives. This is led by the Department of Higher Education and Training and the Department of Science and Innovation respectively.

DFFE is the lead department for the Oceans 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 7.5% 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 (2019 – 2024), seeks to grow sector revenue from R0, 67 billion to R3 billion; production by 27 020 additional tons; jobs by 6 560 direct jobs and to ensure increased participation to support transformation in the sector.

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

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 (3ft) plans across the three horizons defined by the Lab participants in 2014.

The previous Year One – Year Five Annual Review publications are available on the DFFE website:

https://www.dffe.gov.za/projectsprogrammes/operationphakisa/oceanseconomy

1.4 PROGRESS ON AQUACULTURE KEY PERFORMANCE INDICATORS

It has been six years since the introduction of Operation Phakisa: Oceans Economy and while the vision remains to grow the aquaculture sector, the COVID-19 pandemic had varied adverse effects on the sector. This was seen across the board from species farmed for export, those supplying the hospitality industry as well as the informal market. This is reflected in the updates noted below.

2020 LAB PROJECTIONS

The table below summarises the projected potential in terms of investment, jobs, production, transformation and the GDP contribution by the 45 registered Operation Phakisa aquaculture projects.

INVESTMENT 2020 ACTUAL

By end of **2020**, total actual investment committed to Operation Phakisa Aquaculture projects was over **R3.1 billion**, of which over **R239 million** was from government.

The additional actual investment (private and government) in **2020** was **R875 million.** Committed government investment in **2020** was over **R404 million**, which will be utilised from **2020** onwards.

2020 PROJECTED

DURING **2020** AS PER THE **3FT** PLANS AN ADDITIONAL INVESTMENT OF **R2.95 BILLION** (GOVERNMENT AND PRIVATE) WAS REQUIRED FOR THE **45 PROJECTS.**

JOBS 2020 ACTUAL

As of **2020**, the total number of jobs created by Operation Phakisa registered projects was **2 480**. This means that between **2019** and **2020**, there was a total of **38** job losses.

- **2 518**, previous total jobs on farms in **2019**;
- **38**, direct jobs losses in **2020**;

The total new jobs since **2014**: **301 (in 2015) +171 (in 2016) + 224 (in 2017) + 337 (in 2018) + 151 (in 2019) -38 (in 2020) = 1146**

Disaggregated jobs (of total jobs on farm):

- Sex: Females **(999) 40%**, Males **(1 481) 60%**
- Ages: Youth **(1 030) 42%**
- Race: African black **(1 515) 61%**; Coloured **(781) 31%**; White **(182) 7%**; Asian **(2) 0,1%**
- Disabilities **(16) 1%**
- Veterans **(6) 0,2 %**

The total jobs for the sector were **3 648** (excluding the crocodile subsector).

2020 PROJECTED

THE PROJECTED ADDITIONAL JOBS WERE **1 451** FROM THE BASELINE OF **1 367** JOBS.

GDP 2020 ACTUAL

Total actual turnover (based on tonnage) across projects amounted to over **R744 million** per annum in **2020**.

The total value of the aquaculture sector in **2020**, was over **R 1.1 billion**

2020 PROJECTED

THE GDP CONTRIBUTED BY THE **45** PROJECTS WAS PROJECTED TO BE **R1.7 BILLION** IN **2020.**

THE PROJECTED INCREASED TURNOVER IS **R1.2 BILLION** PER ANNUM ACROSS THE **45** PROJECTS FROM THE BASELINE OF **R431 MILLION.**

TRANSFORMATION 2020 ACTUAL

Operation Phakisa project transformation statistics in **2020**:

SMMEs = **24**

Cooperatives = **1**

Average BBBE Level = **< Level 2**

PRODUCTION 2020 ACTUAL

Operation Phakisa projects contributed a total of **4 204 tons** production in **2020**, which is **545.5 tons** less than **2019**. This equates to a **11%** decrease from **2019**.

The total production for marine and freshwater for the sector (excluding seaweed) was **6 045.97 tons**.

2020 PROJECTED

THE PROJECTED ADDITIONAL PRODUCTION WAS **23 971 TONS** FROM THE BASELINE OF **3506 TONS.**

1.5 HIGHLIGHT PER INITIATIVE

★ QUICK WINS

Priority initiatives identified by the Aquaculture Lab to support the implementation of catalyst projects.

1. SELECTION & IMPLEMENTATION OF CATALYST PROJECTS

- Since the Lab in 2014, twenty-eight (28) new projects have been assessed and incorporated as part of Operation Phakisa Oceans Economy. In total there are forty-five (45) projects. Twenty-eight (28) of the 45 projects are producing farmed aquaculture animals.
- The small-scale aquaculture implementation plan was finalised in March 2020, this will be used as a technical guide for the small-scale aquaculture framework.

★

2. LEGISLATIVE REFORM

Aquaculture Development Bill:
approved by Cabinet on 9 May 2018 and was introduced to Parliament on 15 June 2018. It is expected to be taken up by the newly appointed 6th administration. Further engagement with industry took place and internal consultations are underway within DFFE.

Strategic Environmental Assessment:
The study was completed and the next step is implementation.

3. INTER-DEPARTMENTAL AUTHORISATIONS COMMITTEE

Environmental Authorisations completed since October 2014:

- Twelve (12) Environmental Impact Assessments (EIA) were completed and authorised, two appeals completed.
- Seven (7) coastal discharge permits were issued.
- Nine (9) biodiversity risk assessments
- Seven (7) land leases have been issued and nineteen (19) new water leases were allocated and approved.
- Twenty-eight (28) marine aquaculture permits/Rights were issued

★

4. GLOBALLY RECOGNISED MONITORING & CERTIFICATION SYSTEM

Marine Stewardship Council (MSC) awards the rope grown mussel subsector:

Funding to the value of R1.06 million was awarded by the MSC to WWF South Africa to assist with mussel farm sector certification. This is in collaboration with WWF South Africa, where the fishery has successfully implemented a fishery improvement project (FIP) to help progress towards MSC assessment.

5. AQUACULTURE DEVELOPMENT FUND

- Aquaculture Development and Enhancement Programme: New guidelines were published by the DTIC as from April 2019
- Feasibility Studies:
https://www.dffe.gov.za/documents/research#feasibilitystudies

- Funding Directory:
https://www.dffe.gov.za/sites/default/files/docs/developmentfinance_aquaculture.pdf

★

6. CAPACITY BUILDING & SKILLS DEVELOPMENT FOR SUPPORT SERVICES

- The aquaculture qualifications for 'Aquaculture Farmer' and 'Aquaculture Farm Assistant' were completed and approved by SAQA (South African Qualifications Authority) in 2018.
It is available here:

https://regqs.saqa.org.za/viewQualification.php?id=104904

- China-South Africa Aquaculture Technology Demonstration Centre (ATDC): 431 potential farmers and government officials were trained and the aim is to broaden it to SADC countries.

7. COORDINATED INDUSTRY-WIDE MARKETING EFFORTS

- The Standard Bank Group assisted in providing new market access (especially for abalone) during COVID-19
- Exemption on sale of undersized-farmed abalone on the local market was approved with conditions on 8 September 2020.
- DFFE and TAASA (Tilapia Aquaculture Association of South Africa) formed import/export working group in order to strengthen and diversify markets going forward. Looking to protect local sector, trade regulations and exports

★

8. PREFERENTIAL PROCUREMENT

In order to access public sector markets and designate local fish products, baseline market information is required. Collaboration with the Department of Correctional Services nutritional guidelines for the procurement of fish products was set in motion. The facilities to conduct the acceptability trials were identified; questionnaires developed and the number of offenders and quantities were ascertained.

9. DEVELOP & IMPLEMENT AQUACULTURE DEVELOPMENT ZONES (ADZS)

To promote investment into the sector and create an enabling environment, the DFFE has embarked on a process to establish ADZs. 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 eight (8) ADZs registered and monitored under this initiative.

Algoa Bay ADZ: The Environmental Authorisation was issued on the 26 January 2020.

1.6 YEAR SIX REVIEW

PROGRESS: INITIATIVE 1 – SELECTION AND IMPLEMENTATION OF CATALYST PROJECTS

Since the Lab in 2014, twenty-eight (28) new projects have been assessed and incorporated as part of Operation Phakisa Oceans Economy. In total there are forty-five (45) 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 nine (9). Twenty-four (24) of these projects are considered Small, Medium and Micro-Sized Enterprises (SMMEs). Twenty-eight (28) of the 45 projects are producing farmed aquaculture animals.

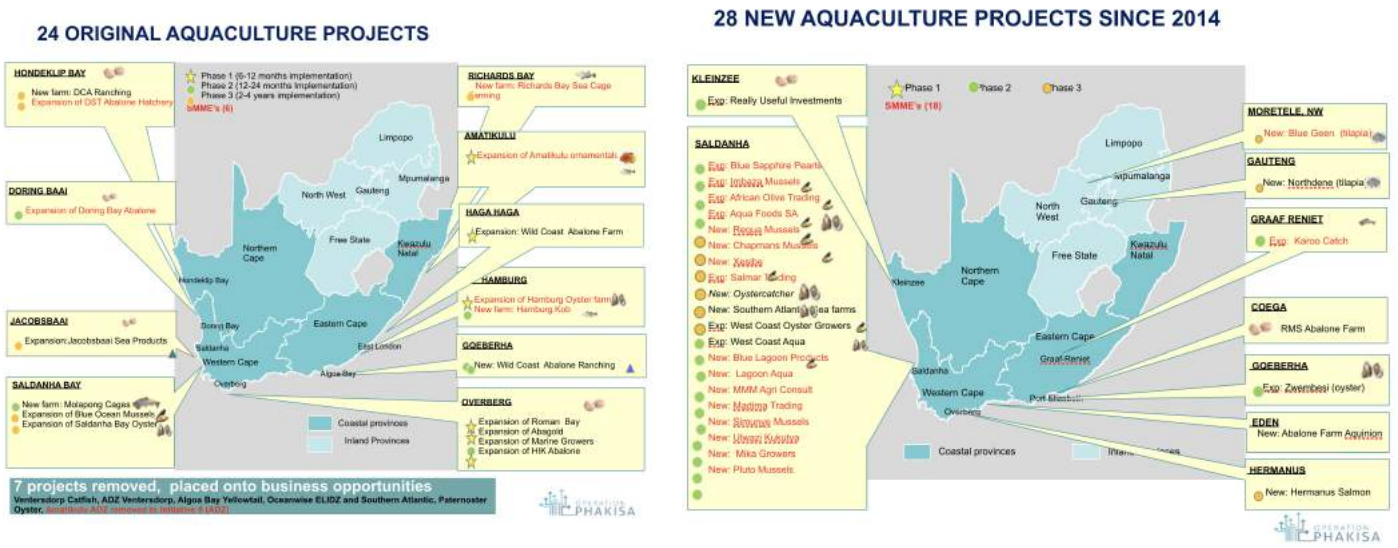
In summary, the delays and challenges experienced by some projects include funding, road repair, poaching, coastal water quality, water leases, land leases and authorisations.

TRANSFORMATION STRATEGY AND SMALL-SCALE FRAMEWORK FOR AQUACULTURE

The department commissioned the development of a transformation strategy and small scale policy in order to support small scale aquaculture and ensure efficient transformation of the sector. Workshops were held on the draft 'Transformation Strategy for the Aquaculture Sector' and a Comprehensive Aquaculture Small Scale Framework was completed as a first step towards development of the small scale policy. The small-scale feasibility studies were published for the following species: catfish, marron, crayfish, Nile and Mozambique tilapia, oysters, mussels and rainbow trout. This will assist new entrants with assessing the minimum viability for establishing a small-scale aquaculture operation in South Africa.

The small-scale aquaculture implementation plan was finalised in March 2020. This will be used as a technical guide for the small-scale aquaculture framework. The plan aims to guide how the participation of small-scale fish farmers can be improved and integrate as part of mainstream aquaculture activities. The DFFE developed a COVID-19 Recovery Plan in consultation with industry in May 2020.

THE MAPS INDICATE THE 24 ORIGINAL AQUACULTURE PROJECTS AND THE 28 PROJECTS ADDED SINCE 2014.



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 amend legislation to streamline the assortment of existing regulations and creates an enabling environment to promote 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 introduced to Parliament on 15 June 2018. During the 2020 reporting period, further engagement with industry took place including a workshop in order to garner consensus around issues. Thereafter internal consultations took place within DFFE.

AQUACULTURE STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA)

The purpose 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. The study was completed and the next step is implementation.

NORMS AND STANDARDS

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

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 revised General Discharge Authorisation conditions were published for comment in 2019. There was no update on the GDA during the reporting period.

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. DFFE has communicated regulatory implications of a state legal opinion that was sent to industry stakeholders. The revised regulations were published on 16 February 2018, however, since the matter has been taken to court, these regulations have not been implemented. Ground truth mapping of Nile tilapia is underway in Mpumalanga and Limpopo.

PROGRESS: INITIATIVE 3 - ESTABLISHMENT OF AN INTER-DEPARTMENTAL 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: Forestry, Fisheries and the Environment, Public Works and Infrastructure; Agriculture, Land Reform and Rural Development, Water and Sanitation, Public Enterprises (Transnet National Ports Authority) and Mineral Resources and Energy.

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 DFFE 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'. The Director-General approved a submission on 26 September 2020 to revitalise and reappoint the IAC members with new letters that will be issued to relevant Departments to nominate attendees. Letters were circulated and some nominations were received.

ENVIRONMENTAL AUTHORISATIONS ISSUED FOR OPERATION PHAKISA PROJECTS SINCE OCTOBER 2014:

- Twelve (12) Environmental Impact Assessments (EIA) were completed and authorised, two appeals completed.
- Seven (7) coastal discharge permits were issued.
- Nine (9) biodiversity risk assessments (Barramundi, Coho, King Salmon, Siberian Sturgeon, Rainbow Trout, Catfish, Nile Tilapia, Mozambique Tilapia and Common Carp).

- **Saldanha Bay Aquaculture Development Zone Environmental Impact Authorisation:**

  - The Minister of DFFE approved the ADZ authorisation on 8 January 2018 and the appeal decision took place on 7 June 2018.
  - Saldanha Bay ADZ could potentially create between 780 - 2 500 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 (CF).
  - DFFE and Transnet National Ports Authority (TNPA) have engaged regularly around the allocation of new water space in Saldanha Bay in line with the revised area authorised in the EIA.
  - The year one external audit was conducted for February 2020.

- **Algoa Bay Aquaculture Development Zone:**

  - Alternative sites are being assessed and considered. There are three precincts with a different combination of species and area combinations. There is only one precinct being considered for finfish i.e. the Algoa 7 Coega site, other precincts propose the farming of bivalves.
    The Environmental Authorisation was issued on the 26th January 2020.

- **COEGA Aquaculture Development Zone:**

  - On 7 February 2018 the DFFE granted an integrated environmental authorisation for the development and operation of the Coega Land-Based ADZ in the Coega Industrial Development Zone.
  - Seven (7) land leases have been issued.
  - Nineteen (19) new water leases were allocated and approved in total. One for an Operation Phakisa aquaculture project in Gqeberha and eighteen (18) projects received lease options in Saldanha Bay (ADZ) new water leases were approved for projects in Saldanha Bay.
  - The water use license notice for the Vanderkloof dam was received.
  - Coastal lease and water use license was issued for Qolora ADZ. Extension of the Environmental Authorisation was granted in October 2020 and is valid until September 2023.
  - Twenty-eight (28) marine aquaculture permits/Rights were issued.

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.

An additional food safety unit was not established due to the limitation of the fiscal environment. The DFFE is working with relevant departments and laboratories to set up memorandum of understanding (MOU) and validate laboratory and tests.

CERTIFICATION FRAMEWORK:

The final certification framework for aquaculture products in South Africa was completed in October 2019 and will assist the country with meeting local and international standards around certification for aquaculture.

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 programme, however, may not be approved due to the veterinary drug residue methods not being validated for the relevant matrices. To address this, the DFFE is in the process of finalising a Service Level Agreement (SLA) with the Agricultural Research Council – Onderstepoort Veterinary Institute (ARC-OVI) to validate the required methods and have them accredited.

The National Regulator for Compulsory Specifications (NRCS) is leading engagement around the potential EU audit. NRCS are engaging Republic of China around the listing of correct oyster species from South Africa. NRCS shared that a virtual audit by China of two Fish Processing Establishments (FPE's) (frozen fish) was held on 29 October 2020. In general, feedback was positive with some minor concerns (social distancing, flow). The main focus was COVID-19 protocols.

MARINE STEWARDSHIP COUNCIL (MSC) AWARDS THE ROPE GROWN MUSSEL SUBSECTOR:

During the reporting period, funding to the value of R1.06 million was awarded by the MSC to WWF South Africa to assist with mussel farm sector certification. This is in collaboration with WWF South Africa, where the fishery has successfully implemented a fishery improvement project (FIP) to help progress towards MSC assessment.

STANDARDS:

DFFE and the NRCS are working on the Dried Abalone Standard Compulsory Specification since the Dried Abalone Standard was published.

SEA URCHIN PRODUCTION:

A South African National Standard of live, raw chilled and processed aquaculture urchins (SANS 2091) is in the process of being drafted, which will facilitate the export of urchins. Technologies for commercial grow-out of sea urchin are also being further refined.

STANDARDS AND COMPULSORY SPECIFICATIONS TO DATE:

A. LIST OF COMPULSORY SPECIFICATIONS

STANDARD NO:	NAME OF THE STANDARD	DATE PUBLISHED	ENTITY
-	Compulsory Specification For Live Aquacultured Abalone (VC 9001)	June, 2012	-
No. R. 934	Compulsory specification for live lobsters	19 August 2016	Department of Trade Industry and Competition
No. 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 Industry and Competition
No 870	Compulsory specification for aquacultured live and chilled raw bivalve molluscs	10 August 2018	Department of Trade Industry and Competition
No. 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 Industry and Competition

B. LIST OF PUBLISHED STANDARDS

SANS NUMBER	TITLE	DATE APPROVED	REAFFIRMATION DUE
SANS 585:2018	The production of frozen fish, marine molluscs, and products derived therefrom	2018-03-16	2023-03-16
SANS 587:2020	Canned fish, canned marine molluscs &canned crustaceans & products derived thereform	2020-03-30	2025-03-30
SANS 729:2018	Live aquaculture abalone	2018-11-02	2023-23-02
SANS 788:2019	Frozen shrimp (prawns), langoustines & crabs	2019-03-28	2024-03-28
SANS 1647:2018	Approved market names for South African fish& related seafood species	2018-06-01	2023-06-01
SANS 1680:2014	Live lobsters	2020-08-07	2025-08-07
SANS 2074:2019	Frozen lobster, frozen lobster products and products derived therefrom	2019-03-28	2024-03-28
SANS 2329:2019	Dried abalone	2019-03-28	2024-03-28
SANS 2877:2019	Chilled smoked finfish & smoked-flavoured finfish & products deriveed thereform	2019-12-13	2024-12-13
SANS 2879:2016	Live and chilled raw bivalve molluscs	2016-04-08	2021-04-08
SANS 6317:2003	Methods of chemical analysis of meat & fish products	2003-02-28	2023-10-05
SANS 8834:2020	Crude fish oil	2020-01-24	2025-01-24
SANS 10066:2011	Application of thermal process control to low-acid fish canning factories	2011-09-16	2024-01-25
SANS 10239:2020	Hygienic practices on commercial fishing vessels	2020-12-11	2025-12-11

PROGRESS: INITIATIVE 5 - ESTABLISHMENT OF AN AQUACULTURE DEVELOPMENT FUND

Initiative 5, looks at the 'Aquaculture Development Fund,' (ADF) 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 (DFIS) AND DEPARTMENTS:

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

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 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.dffe.gov.za/documents/research#feasibilitystudies

Funding Directory:

https://www.dffe.gov.za/sites/default/files/docs/developmentfinance_aquaculture.pdf

AQUACULTURE DEVELOPMENT AND ENHANCEMENT PROGRAMME:

New ADEP guidelines were published by the **DTIC** and were effective from 1 April 2019.

AQUACULTURE FINANCE AND

INVESTMENT SEMINAR:

The seminar was postponed due to the COVID-19 pandemic. Engagement continued online with funders during the period to see how financial assistance could help.

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 the DFFE. 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 analysis of the sector was presented at various platforms including the South African International Maritime Institute (SAIMI) Conference held in Durban during October 2019. In order to help inform interventions by various role players responsible for aquaculture, the skills needs were modelled and projected over the next five years in terms of quantifiable numbers.

In order to address the scarce aquatic veterinarian skills and services available in South Africa, DFFE 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 DFFE 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. Two vets attended short courses (3 months) during 2019.

AQUACULTURE QUALIFICATIONS (THROUGH AGRISETA):

The aquaculture qualifications for 'Aquaculture Farmer' and 'Aquaculture Farm Assistant' were completed and approved by SAQA (South African Qualifications Authority) in 2018. It is available on the website, linked here: *https://regqs.saqa.org.za/viewQualification.php?id=104904)*. The development and approval of the aquaculture farmer qualifications framework was completed in partnership with AgriSETA. The DFFE and SAIMI were investigating Research Chairs and Community of Practice for aquaculture.

THE CHINA-SOUTH AFRICA AQUACULTURE TECHNOLOGY DEMONSTRATION CENTRE (ATDC):

The China-South Africa Aquaculture 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 in June 2017, 431 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.

AQUACULTURE SKILLS PROGRAMME (SHORT SKILLS) BOOKLET:

The Aquaculture Skills Programme (Short Skills) available in SA booklet was developed and published in October 2019. One of the key challenges is information sharing and knowledge around the aquaculture sector in general, including the availability of local training opportunities. The Department of Agriculture, Rural Development and Land Reform publishes career booklets annually which includes various diploma and degrees available related to aquaculture. However, this does not include short skills and programmes. Therefore, the booklet provides a guideline in terms of short skills programmes currently provided for aquaculture.

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, currently at 8kg per person per annum and encourage the growth of small-scale farmers and new entrants. The coordination of industry wide marketing efforts is under way in order to reduce duplicative efforts and resources.

MARKETING AND AWARENESS:

During 2019, the Public Awareness and Marketing Strategy for Aquaculture Products and the Sector in RSA was completed. The public awareness strategy report consists of two parts: the first provides a general global overview of studies on perceptions of aquaculture and the second provides specific recommendations for addressing public concerns, and the roles that key stakeholders can play in promoting the public understanding of aquaculture (PUA). In addition, strategies for promoting aquaculture as a career and business opportunity were identified. Key target groups for improving the PUA who were interviewed included a few South African consumers, restauranteurs and chefs, supermarket retailers, small seafood retailers/ fish shops/ fishmongers and seafood wholesalers.

ADVERTISING CAMPAIGN:

Videography content of local aquaculture species was developed to promote how farming is done and how to prepare recipes on each of the five species - mussels, oysters, catfish, trout and tilapia. The link to the videos can be found on the YouTube link here:
https://www.dffe.gov.za/media/audioandvisual#2019videos

The Aquaculture Recipe Book was revised and published during the reporting period

INVESTMENT PROMOTIONS:

The Value Proposition for the Aquaculture Sector was completed with the **dtic**. The value proposition provides an overview of why and how to invest into the sector which is a valuable tool for targeting new investors.

MARKET ACCESS:

- The Standard Bank Group assisted in providing new market access (especially for abalone).
- Exemption on sale of undersized-farmed abalone on the local market was approved with conditions on 8 September 2020.
- DFFE and TAASA (Tilapia Aquaculture Association of South Africa) formed import/ export working group in order to strengthen and diversify markets going forward. Looking to protect local sector, trade regulations and exports (8 July 2020).

ESTABLISHMENT OF AFRICAN CHAPTER OF THE WORLD AQUACULTURE SOCIETY (WAS):

South Africa (through DFFE) has facilitated and supported the establishment of an African Chapter of the WAS. The Chapter aims to provide support towards aquaculture development on the African continent by:

- Creating a forum to increase exposure, share information and facilitate collaboration.
- Collaborate with the continent and between continents around research, technology and education.
- Co-ordinate conferences and other platforms.

Progress: The African Chapter hosts structured webinars within the regions and through partner organisations e.g. Aquaculture African Magazine, WorldFish etc. Through the regular WAS media platforms aquaculture information continues to flow to audiences including the flagship 'Journal of the World Aquaculture' (full of research and educational material). Website: *https://www.was.org/AC/default.aspx*

In terms of collaboration, WAS AC continues to grow, having adopted by organisations such as FAO, SADC, World Aquatic Veterinary Medicine Association (WAVMA), Uganda Agriculture Research Council, Aller Aqua Feed company, and is discussing with other entities for possible MoUs for co-operation, specifically for the annual flagship conference - Aquaculture Africa. The WAS AC Secretariat is formally housed at the AUDA-NEPAD in Midrand, South Africa through a signed Hosting Agreement.

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:

The discussion with the Department of Correctional Services (DCS) with regards to including farmed freshwater fish in their specification is underway. The facilities to conduct the acceptability trials have been identified; questionnaire developed and the number of offenders and quantities were ascertained. The DFFE and DCS have engaged since March 2018. Follow up engagements took place to request amendment of nutritional guidelines and specifications by DCS to include aquaculture products. Acceptability trials are planned to take place at certain correctional facilities.

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

AQUACULTURE DEVELOPMENT ZONES

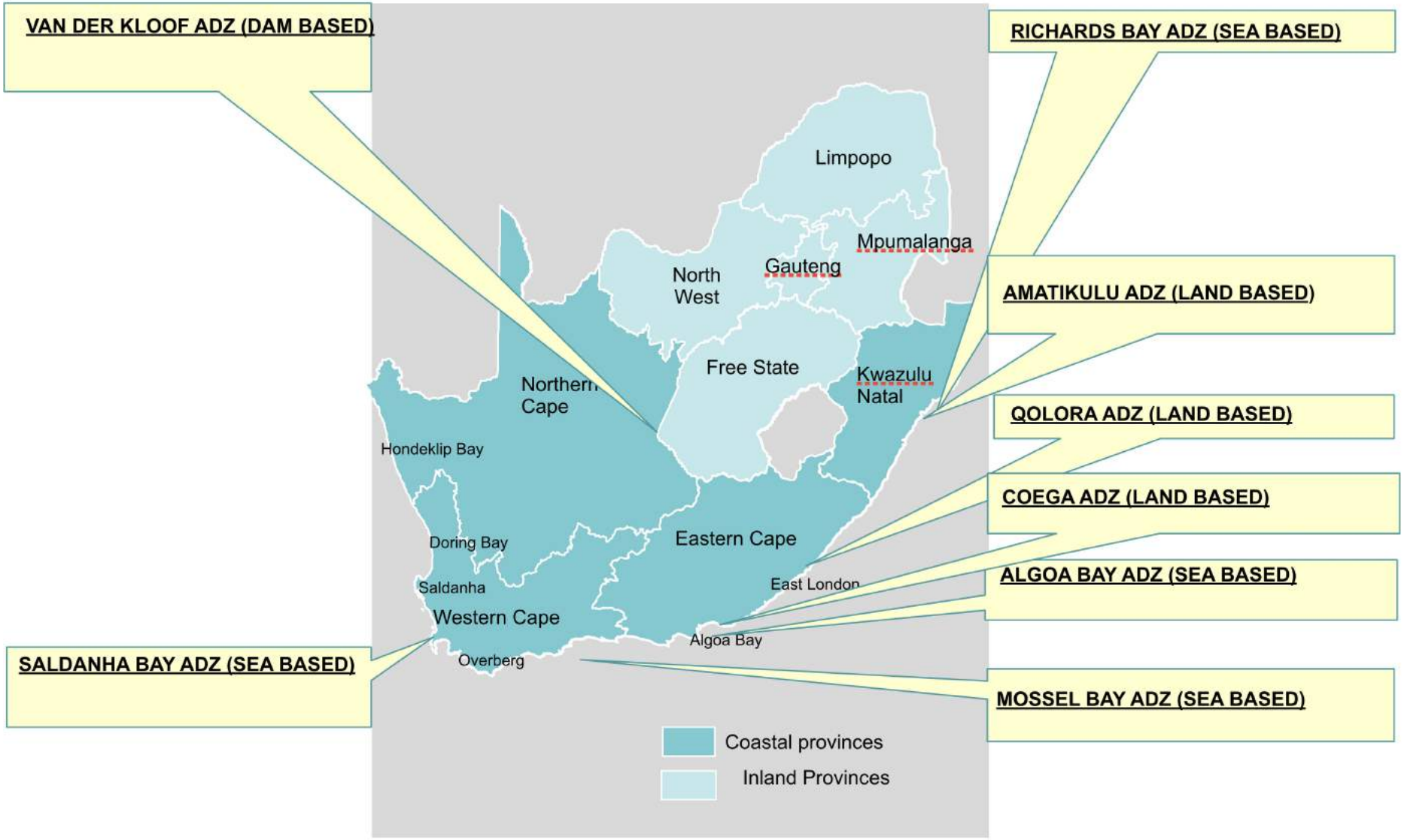
In order to promote investment into the sector and create an enabling environment, the DFFE has embarked on a process to establish ADZs. An ADZ is an area or site either on land or sea set aside exclusively for aquaculture use or development and may have bulk infrastructure (reservoir, water pump) to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

AQUACULTURE DEVELOPMENT ZONES



THERE ARE CURRENTLY EIGHT ADZS 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 hectares. 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.

Progress: The Amatikulu ADZ application for Environmental Authorisation has been declined. The department has submitted an appeal. The EIA appeals decision was referred to the Minister of Justice on 8 September 2020 for consideration.

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, Technology and Innovation (DSTI), 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 dusky kob life cycle has been closed and the species appears to be well suited to marine aquaculture, as it grows fast, has a good yield, and are tolerant of a wide range of temperature and salinity conditions. 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 DSTI KZN Aquaculture Development Project has since been concluded and the ADZ feasibility study has commenced.

Progress: Richards Bay feasibility study is completed and discussions with TNPA about the risks took place on 1 October 2020, DFFE is awaiting formal response from TNPA to take the zone forward.

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 2.6km northeast of the Great Kei River mouth and ±80km northeast of East London. The site has an area of 26.4 hectares of land. An abalone farm is proposed for community participation and beneficiation. Other targeted species include marine finfish and seaweed. The ADZ requires funding for basic infrastructure as all authorisations were received.

Progress: DFFE has applied for an extension to the EA, which expired on 29 September 2020. The department requested condonation for a three-year extension of the Qolora Environmental Authorization by the Eastern Cape Department of Economic Development, Environmental Affairs and Tourism (DEDEAT). An environmental authorisation extension was issued/granted to DFFE for the project on 13 October 2020 until 29 September 2023. DFFE have worked together with the DALRRD in obtaining a Valuation Certificate from the Office of the Valuer General. The Valuation Certificate will assist the DALRRD/DFFE with developing lease agreements for interested parties that would want to develop an aquaculture venture on the Qolora Site. The Valuation Certificate was issued on 18 May 2020.

4. Van der Kloof Aquaculture Development Zone:

The Vanderkloof dam is situated in the Northern Cape approximately 130km upstream from Gariep 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 3, Inter-departmental 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.

Progress: Implementation is continuing at the ADZ.

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:

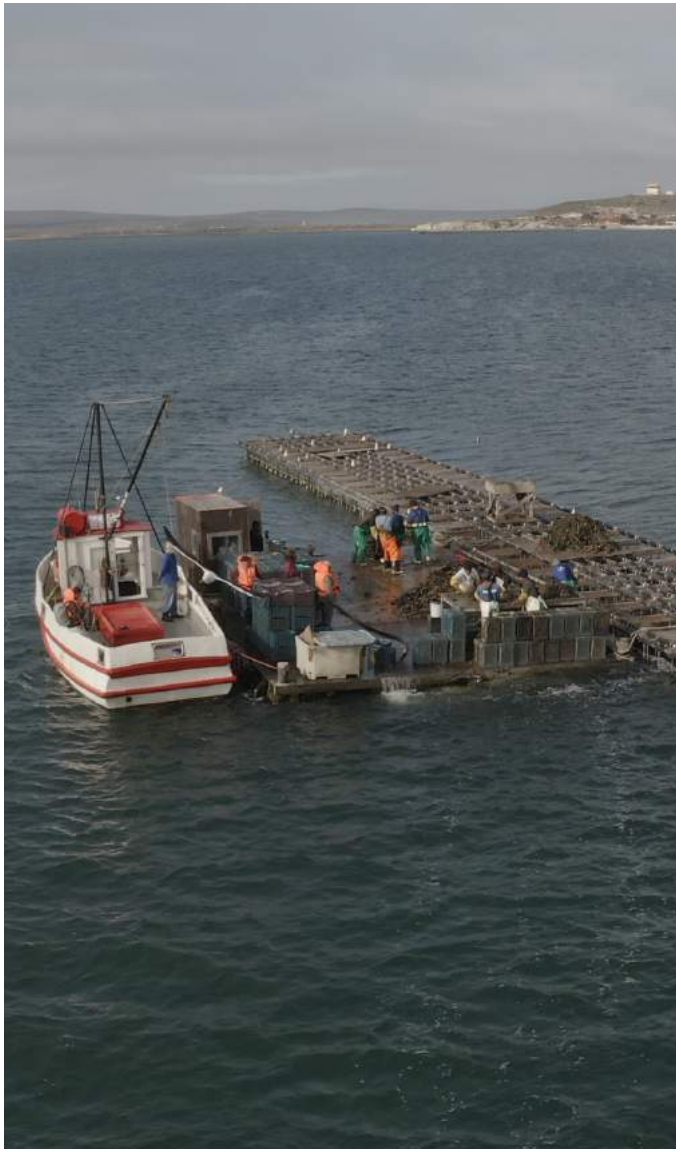
Located in the Western Cape, this is a sea based ADZ. The target species are bivalves (mussels and oysters) and finfish however an EIA is planned for the zone and will determine the size, location and species best. An Environmental Assessment Practitioner needs to be appointed in order to undertake the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

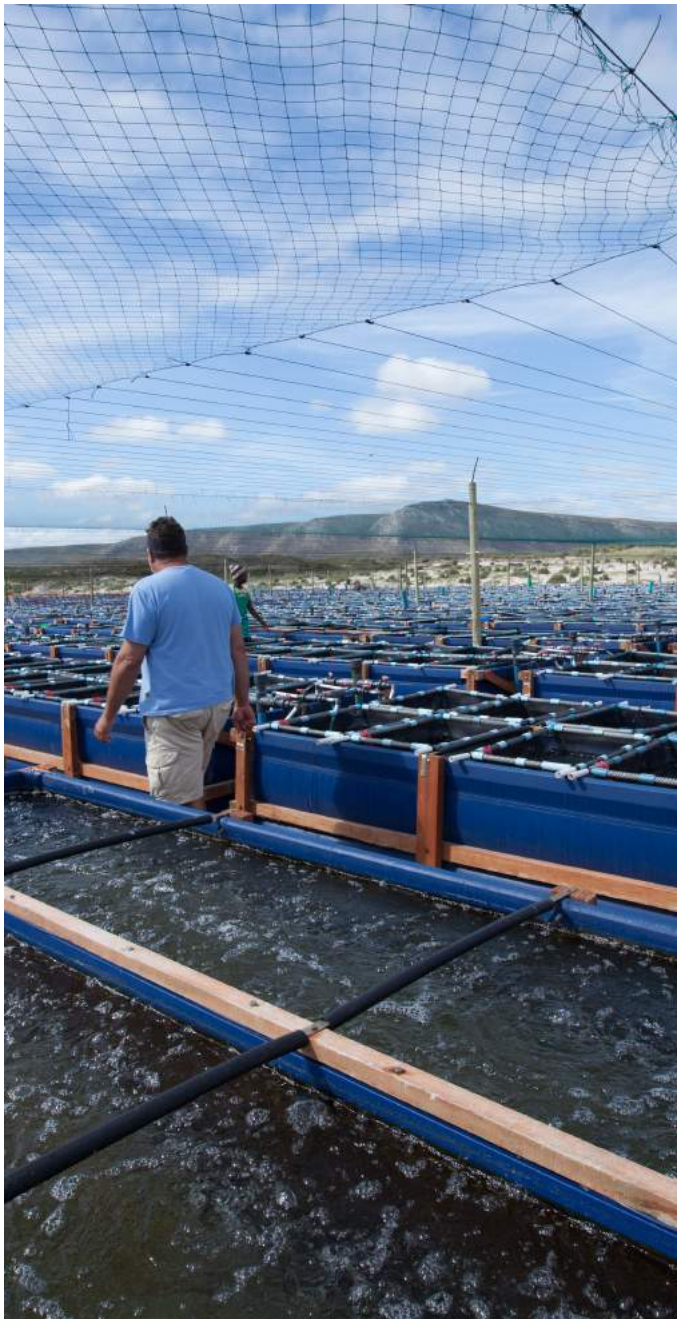
Progress: DFFE is in the process of procuring a service provider to undertake this study.

8. Algoa Bay Aquaculture Development Zone:

The DFFE intends to establish and manage a sea-based ADZ in Algoa Bay in the Eastern Cape. The ADZ would accommodate finfish as well as bivalve culture (oysters/ mussels) within a combination of precincts. The location of the ADZ is ideal as the zone would be able to support potential processing facilities established in the Port or in the Coega Industrial Development Zone. Potential aquaculture farms may be developed in the Coega Industrial Development Zone subsequent to the development of the sea-based Algoa Bay ADZ.

Progress: Refer to Initiative 3. Public participation meetings were held in Port Elizabeth on 31 July and 1 August 2019. The Final Basic Assessment report was submitted to the Branch: Environment on 21 October 2019 as per the legislative timeframes. The Environmental Authorisation was issued on 26 January 2020.





2.

YEAR SIX SNAPSHOT

STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA) FOR MARINE AND FRESHWATER AQUACULTURE DEVELOPMENT IN SOUTH AFRICA

(Edited SUMMARY (Part-0) of DFFE 2019, SEA for Marine and Freshwater Aquaculture Development in South Africa. CSIR Report Number. CSIR/IU/021MH/ER/2019/0050/A. Stellenbosch, WC.)

http://aquasea.csir.co.za/wp-content/uploads/2019/12/Part-0_Cover_Summary_Content.pdf

CONTEXT FOR THE SEA

The global community is facing one of the world's greatest challenges – how to feed in excess of nine billion people by 2050 in the context of climate change, economic and financial uncertainty, and growing competition for natural resources. Agriculture and food are key to achieving the entire set of Sustainable Development Goals (SDGs). The Sustainable Development Goals (SDGs) were adopted by the United Nations in 2015 as a universal call to action to end poverty, protect the planet, and ensure that by 2030 all people enjoy peace and prosperity. Many SDGs are directly relevant to fisheries and aquaculture, in particular SDG 14 which seeks to ''Conserve and sustainably use the oceans, seas and marine resources for sustainable development''. These sectors continue to make crucial contributions to global food security and providing nutrition (protein) through the use of natural resources to ensure sustainable development in economic, social and environmental terms (FAO, 2018).

Since the 1960s, the South African marine and freshwater aquaculture sectors have shown notable growth compared to other industries in the agriculture sector, and although it is generally considered to still be in its infancy, the South African government has recognised its potential to improve and make a meaningful contribution towards food security, economic prosperity, sustainable livelihoods and transformation in South Africa. Aquaculture also has the potential to reduce the pressure on wild caught fisheries stocks.

NEED FOR THE STRATEGIC ENVIRONMENTAL ASSESSMENT (SEA)

The South African marine and freshwater aquaculture sectors currently face many challenges which include the economic climate; climate change, access to land and sea space, and freshwater scarcity. The sector is also highly regulated, as it requires authorisations, licenses and permits from a number of different authorities at the national, provincial and local level.

The Department of Forestry, Fisheries and the Environment (DFFE) has committed their mandate to identify adaptive processes to create an appropriate enabling environment where aquaculture development can be promoted and incentivised. To achieve this, the SEA identifies strategically suitable focus areas where marine and freshwater aquaculture facilities can be developed in a way that optimises sustainable development while limiting negative impacts on the natural environment while yielding the highest possible socio-economic benefits. Pre-assessments of the biophysical and social environments typified of these areas were undertaken as part of the SEA process to produce sensitivity maps of each focus area.

SCOPE AND METHODOLOGY

The SEA has considered various types of marine (i.e. offshore, nearshore and land-based) and freshwater (i.e. instream and land-based) aquaculture environments; different types of marine (i.e. cages, longlines, rafts and tanks) and freshwater (i.e. cages, ponds, raceways and tanks) aquaculture production systems. It has also considered several marine aquaculture species (i.e. Abalone, Atlantic salmon, Dusky kob, Mediterranean mussel and Pacific oyster) and freshwater aquaculture species (i.e. African Sharptooth catfish, Brown and Rainbow trout, Mozambique and Nile tilapia, and Marron crayfish). Areas for potential marine aquaculture (mariculture) were identified from all four coastal provinces, whereas areas in all nine provinces of South Africa were assessed for potential freshwater aquaculture development.

The identification of the proposed Aquaculture Development Zones (ADZs) was enabled through integrated spatial analyses and iterative stakeholder consultation. The proposed ADZs were identified by firstly considering, with expert stakeholder input, a wide range of key environmental and socio-economic variables. It was then ranked as opportunities and constraints that are vital to determining the potential for small-scale and

commercial aquaculture development. A number of strategic focus areas were identified through applying an environmental and technical constraints screen. Thereafter, the most suitable aquaculture areas were extracted..

Refining these strategic focus areas resulted in the identification of 25 potential study areas that lead to the delineation of 17 draft ADZs. More expert input has facilitated the further refinement and identification of the final nine freshwater (Figure 1) and eight marine (Figure 2) proposed ADZs, which were further assessed by specialists.

Figure 1: Identified freshwater aquaculture areas

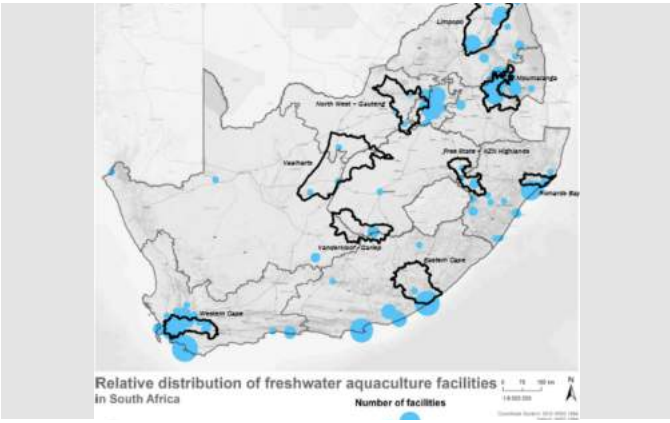
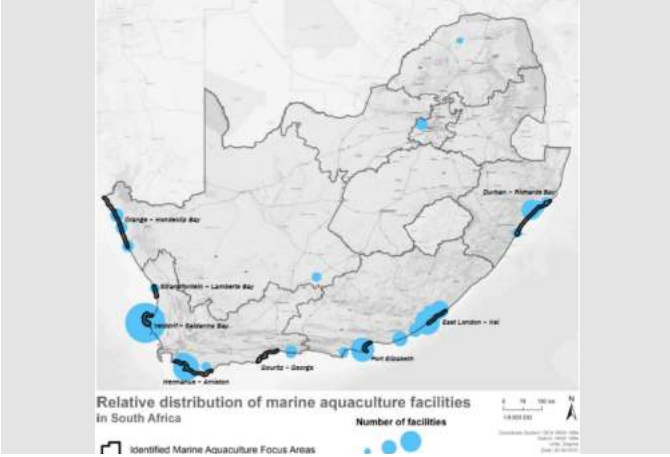


Figure 2: Identified marine aquaculture areas



KEY RECOMMENDATIONS

A key objective of the SEA is to recommend options for possible integration and streamlining of the regulatory environmental approvals required for aquaculture. This will facilitate a more efficient and effective decision-making process in order to create an enabling environment for sustainable growth. Based on a review of the existing regulatory system for marine and freshwater aquaculture, together with discussions with the previous Department of Environmental Affairs (DEA) and and other stakeholders through the course of the SEA; two approaches were conceptualised. These approaches aim to potentially reduce complexity and eliminate duplication of legal requirements under different mandating authorities. It seeks to possibly integrate the environmental regulatory process applicable to marine and freshwater aquaculture development and operations.

The two approaches are (i) an integrated aquaculture application and authorisation system for projects wherever they are located in South Africa, and (ii) a facilitated authorisation process for projects located within proposed ADZs where environmental sensitivities were pre-assessed in this SEA.

Therefore, the SEA strongly recommends the development of an integrated and intergovernmental decision-making platform for marine and freshwater aquaculture that is administered by the DFFE in terms of the Aquaculture Development Bill. It is recommended that ideally this integrated decision-making platform should be implemented through the development and coordination of a centralised integrated aquaculture application and authorisation system that is preferably internet-based and housed in the applicable Fisheries Management Branch of the DFFE.

It is envisaged that this integrated aquaculture application and authorisation system would follow a two–step process: Step 1 – application for a license to engage in aquaculture that is valid for 30 years, and Step 2 – application for relevant permits, that carry a validity period of at least 24 months, to exercise the aquaculture license. The SEA also recommends a further streamlining of the requirement for Environmental Authorisation (EA) for aquaculture activities inside of the proposed ADZs. Also, the identification of aquaculture related activities that may be excluded from obtaining an EA but must comply with any standards to be developed and gazetted in terms of National Environmental Management Act, or if applicable under the Aquaculture Development Bill are key recommendations from this SEA.

Finally, all the information gathered and sensitivity layers that were created should be packaged in a user-friendly version for new applicants and authorities to assist with identifying areas for new aquaculture farms.

NOTES

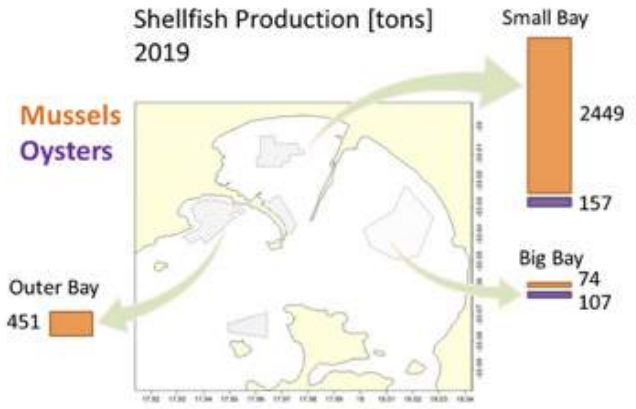
Please note that the application of sensitivity areas and the associated risk **varies** with the type of species farmed and the type of farming system used and should not be used in a blanket approach. For example, the farming of an alien fish species in an open system (e.g. cage) is very different to risk associated with farming the same species in a closed system (e.g. Recirculating Aquaculture System).

MONITORING THE IMPACTS OF AQUACULTURE ON SALDANHA BAY

Saldanha Bay is a large semi-enclosed system located on the west coast of South Africa. The bay is linked on its western side to the coastal upwelling system of the southern Benguela, and also feeds Langebaan Lagoon, a shallow tidal system at the southern end of the bay. The hydrodynamics of the bay were considerably altered in the 1970s with the construction of a causeway for iron ore and oil terminals, creating two sectors of different hydrographic regimes, named Small Bay and Big Bay (Fig. 1).

Besides its strategic importance as a deep-water port and the ecological importance of Langebaan Lagoon, a Ramsar site, the bay is also one of the few embayments on the South African coastline that provides a productive and relatively sheltered environment suitable for aquaculture, particularly for the suspended cultivation of bivalves. Consequently, a fledgling mussel and oyster farming industry developed. The mussel specie *Mytilus galloprovincialis* was initiated in 1984 closely followed by the cultivation of the imported oyster *Crassostrea gigas*. In-water bivalve culture in South Africa is now centred in Saldanha Bay and in 2019 the production of mussels reached

Figure 1: Shellfish culture in Saldanha Bay in 2019 dominated by the production of the mussel *(Mytilus galloprovincialis)* in Small Bay.



2 974 tons and oyster production 338 tons (Fig.1).

As part of the Operation Phakisa: Oceans Economy programme, an Aquaculture Development Zone (ADZ) was established in Saldanha Bay. The ADZ set aside 884 ha to expedite the expansion of farming and to promote investor confidence in the sector. The authorised species for cultivation include both alien and indigenous species of finfish and shellfish, and seaweeds. However, most of the total area considered for allocation to aquaculture is for shellfish farming as only 30% of the ADZ is regarded as suitable for finfish. The establishment of this ADZ has, however, triggered concerns relating to the negative impacts of aquaculture on the bay which can be categorised as: [1] modification of water column dissolved oxygen and inorganic nitrogen; [2] modification of seabed by biodeposition; [3] removal of seston by shellfish; [4] creation of habitat by farm structures; [5] alteration of behaviour and entanglement of seabirds and marine fauna at finfish sites; [6] introduction of aliens and spread of pests; [7] transmission of diseases to wild populations; [8] genetic interaction with wild populations; and [9] pollution by therapeutants and trace metals.

To protect Saldanha Bay from these concerns an Environmental Monitoring Programme (EMP) for the ADZ has been implemented. As part of this plan, dissolved oxygen is used as an ecological indicator that will provide information on ecosystem status and general bay health. This indicator will specifically address concerns relating to eutrophication and organic loading that may lead to the development of hypoxia or anoxia and general environmental degradation. In order to differentiate between natural variability, and the effects of aquaculture, oxygen sensors were deployed both on-farms and off-farms in Small Bay and Big Bay (Fig. 2). Susceptibility of Saldanha Bay to low oxygen is evident in that severely hypoxic (<1 ml O2 l-1) bottom waters characterise the entire bay particularly in autumn. Furthermore oxygen is consistently lower in Small Bay compared to that in Big Bay (a probable function of longer water residence times) and oxygen concentrations on farms in Small Bay are distinctly lower than that at the control site and on occasions approach anoxia (a likely function of organic loading from farming). These results do raise concerns of the health of Small Bay and for this reason it is important that monitoring be sustained in order to detect further declines in oxygen in response to increased aquaculture production.

In addressing bay eutrophication, a nitrate sensor is also moored in Big Bay providing a high resolution time series of nutrient concentrations. Comparison of the relationship between nitrate and temperature within the bay (Fig. 3) to that in coastal waters, and future changes in this relationship will be informative in revealing changes in the eutrophication status of the bay.

Figure 2: Saldanha Bay oxygen time series obtained from moored RINKO Optical Sensors both on-farm and off-farm in both Small Bay and Big Bay for the period April 2020 – June 2021

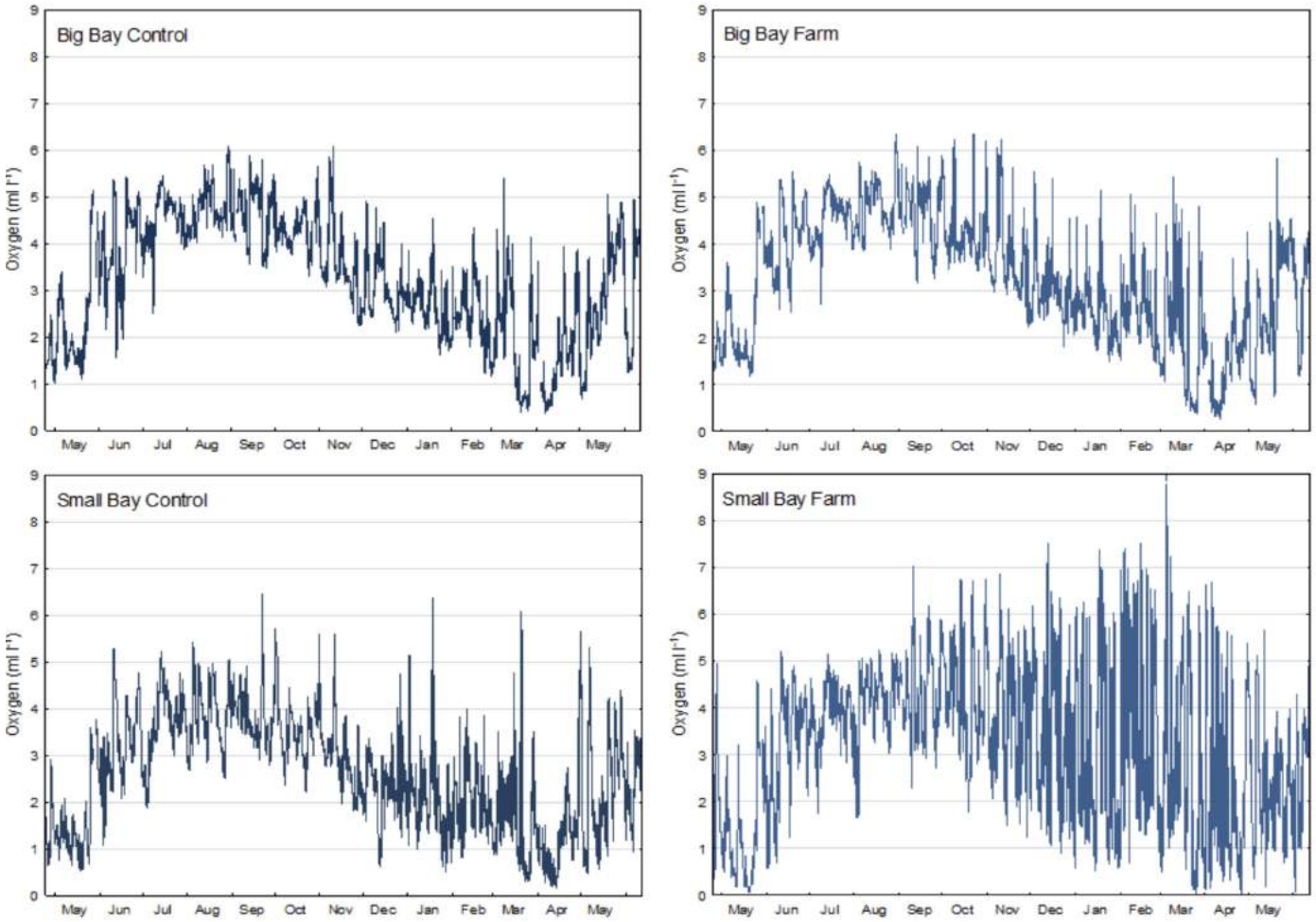
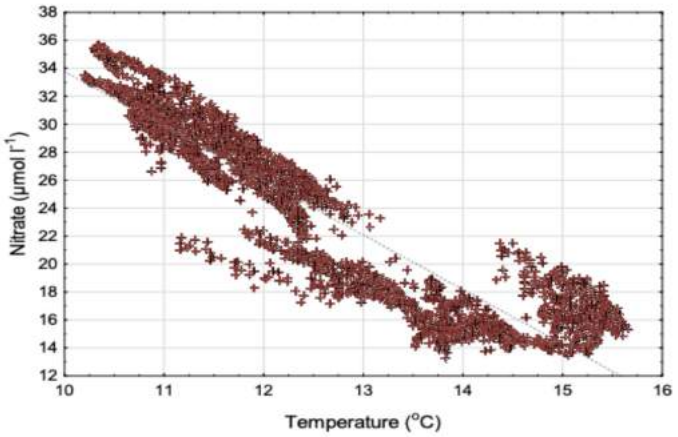


Figure 3: The nitrate-temperature relationship as determined from a SUNA V2 Submersible Ultraviolet Nitrate Analyzer moored in Big Bay.



ALGOA BAY SEA-BASED AQUACULTURE DEVELOPMENT ZONE

The Algoa Bay sea-based Aquaculture Development Zone (ADZ) is part of the Operation Phakisa: Oceans Economy programme, which aims to unlock the ocean's economic potential by creating jobs, increasing GDP contribution, promoting growth for the sector as well as expanding the aquaculture potential in the Eastern Cape. This ADZ is situated in Eastern Cape province on the south eastern coast of South Africa. The previous Department of Environment, Forestry, and Fisheries (DEFF), now the Department of Forestry, Fisheries, and the Environment, granted the Environmental Authorisation (EA) on 26 February 2020. There are three sites identified in Algoa (Algoa 1, 6 and 7) for the farming of finfish and bivalves.

Aquaculture started in the 1980's in South Africa, with mussels, oysters, and prawns being the main species farmed. Abalone farming, however, was only developed in the 1990s. South Africa's total marine aquaculture production in 2015 was 3 592 tonnes, with mussels *(Mytilus galloprovincialis, Chromomytilus meridionalis)* contributing the most (1 758.44 tons) followed by abalone *(Haliotis midae)* (1 479.22 tons) and oysters *(Crassostrea gigas)* (276.85 tons). Finfish such as dusky kob *(Argyrosomus japonicus)* contributed the least to the sector.

The Eastern Cape coastline was identified as having excellent aquaculture potential for the marine and freshwater subsectors. In the Strategic Environmental Assessment (SEA) conducted in 2011, Algoa Option 1, Algoa 6, and Algoa 7 were the three sites selected for marine aquaculture. The site selection process followed some exclusionary criteria. Factors such as water depth; water temperature, distance from another port, turbidity, and pollutants associated with river mouths and Marine Protected Areas were some of the factors that needed to be considered. In all these sites, the necessary mitigation measures were taken to reduce the risks identified in the Environmental Impact Assessment (EIA).

THE ALGOA SITES

The Algoa 1 site was separated into two segments (Option 1- north and Option 2- south) after specialists identified it during the 2011 SEA process as having too much of a negative impact if the entire site was built. The department at the time however, decided to exclude Option 2 (south) from the Algoa 1 site. Algoa 1 Option 1, which is the Summerstrand site (33° 58.860'S; 25° 42.595'E, ≈ 312 hectares), was identified as suitable for bivalves and/or finfish aquaculture. This area and is approximately 2km offshore from the Humewood Beach, King's Beach, Pollock Beach and Hobie Beach. From the initial SEA, it was determined to be one of the best sites because of its proximity to the harbour and reasonably low wave energy conditions.

The Algoa 6 site, which is the Gqeberha Harbour site (33° 56.020'S; 25° 37.651'E, ≈ 479 hectares in size, water depth ranging between 5-12 m), was identified for the culturing of bivalves. This site is considered economically and environmentally feasible for mussel culture since it is quite shallow and would not work for finfish cages due to waste being incorrectly dispersed.

The Algoa 7 site, the Ngqura Harbour site (33° 50.105'S; 25° 43.098'E, ≈ 355 hectares in size, ≈ 3 km offshore from the harbour), was identified as a potential site for finfish aquaculture. This site will not impact shipping traffic, the site does however overlap with the Addo Marine Protected Area (MPA), and practices should be conducted with caution.
To conclude, aquaculture in the Algoa Bay ADZ could alleviate poverty by creating jobs; improving food security, supporting economic growth, developing skills, and creating a better livelihood for local communities. This ADZ has the potential to create up to 2 800 jobs within the value chain, increase contributions toward the country's GDP, and investment into the sector.

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COEGA AQUACULTURE DEVELOPMENT ZONE

BACKGROUND

According to the Food and Agriculture Organization of the United Nations (FAO, 2020), global food fish consumption increased at an average annual rate of 3.1% from 1961 to 2017, a rate almost twice that of annual world population growth (1.6%) for the same period, and higher than that of all other animal protein foods (meat, dairy, milk, etc.), which increased by 2.1% per year. At the same time, the production of capture fisheries has stagnated and reports are suggesting that around 90% of global capture fisheries are currently being over-fished, or fished at carrying capacity.

Aquaculture farming is an alternative to traditional capture fisheries and refers to "the farming of aquatic organisms". It gives an opportunity to increase production without putting additional pressure on marine ecosystems, or further contributing to over-fishing the seas. Aquaculture production has been growing rapidly over the last decades and is expected to continue to do so. By 2030, it is projected that 62% of the global fish supply will come from aquaculture production, compared to 43% in 2012. By 2050, aquaculture production is likely to be the main source of fish on the global market (FAO, 2014; World Bank, 2013).

The Coega Special Economic Zone (SEZ) was established in 1999 to promote socio-economic growth in the Eastern Cape, in line with the South African Government's focus on infrastructure development as a catalyst to economic growth and investment. Integrated with the Coega SEZ, is the Port of Ngqura, which is South Africa's latest commercial port development, situated at the mouth of the Coega River. The CDC's proposal for the development of an Aquaculture Development Zone (ADZ) in the Coega SEZ is in line with worldwide trends and national government policies and programmes. The ADZ has the potential to kick-start and facilitate the growth of a responsible local aquaculture industry that could contribute to the economy in terms of GDP contributions, increased trade flow and delivery of goods and services, employment creation and labour income, without detrimental environmental impacts. As a result, food production in the Nelson Mandela Bay Metro Municipality (NMBMM) will be diversified and be better adapted to meet the challenges of climate change.

COEGA ADZ AS AN INVESTMENT LOCATION

As part of its feasibility assessment into an ADZ, CDC has identified key stumbling blocks for companies seeking to engage in aquaculture in South Africa. These include:

- Expensive land adjacent to the ocean in the case of marine aquaculture;
- Difficulty in obtaining the necessary environmental authorisations to:
  - o Engage in land-based aquaculture; and
  - o Pump seawater onto land and discharge back into the ocean; and
- Lack of serviced sites for aquaculture projects (i.e. electricity, potable water, etc.).

In its quest to provide an investor ready platform for aquaculture investors, the CDC seeks to address these issues by providing affordable, fully serviced sites with all the necessary environmental approvals to its investors.

SITE SELECTION AND DEFINITION OF THE DEVELOPMENT FOOTPRINT

The ADZ is proposed to occupy a development footprint area of ~440 hectares within Zone 10 of the Coega SEZ (Figure 1). Zone 10 is ~1 200 ha in size and located along a ~5.8 km stretch of the Algoa Bay coastline to the north-east of the Port of Ngqura. The ADZ footprint can be roughly divided into a coastal and inland section. The ADZ coastal section fronts onto a ~2 100 m long shoreline, is ~140 ha in size and falls entirely in the Coega SEZ's coastal cluster for development where the old Marine Growers abalone farm and Sea Ark prawn pilot facility used to operate from. The rest of the coastal strip in Zone 10 has been zoned as primary open space.

Figure 1: Location of the ADZ in Zone 10 of the Coega SEZ.

The CDC's plans for the development of an ADZ in Zone 10 of the Coega SEZ follow years of planning and assessment. Various strategic, regional, SEZ-wide and project specific environmental and planning processes have been undertaken to provide context for the ADZ and the selection of the site within the coastal cluster of development in the SEZ.

In essence, these and the other assessment and planning processes, served to evaluate alternative land uses in Zone 10 of the SEZ, including potential conflicts and synergies with other industries throughout the SEZ, and served as the

site selection and delineation of a development footprint for the ADZ. The CDC has already completed an Environmental Impact Assessment (EIA) for more than 30 fish species, meaning that one of the greatest hurdles that SMME's face in aquaculture today, has been removed. A second EIA, looking at where pipelines will cross into the ocean is currently been conducted and the Record of Decision is expected by August 2021.

INVESTIGATING THE FEASIBILITY OF AQUACULTURE IN THE COEGA SEZ

An independent concept design and feasibility study was undertaken in 2014 concluded that Zone 10 of the Coega SEZ is favourable for aquaculture development.The CDC has conducted market research, visited various aquaculture operations and interacted extensively with the aquaculture specialists, operators and potential investors, and there are a number of investors that are keen to establish in the ADZ to produce fresh water species and marine finfish and shellfish species, including abalone. Based on the feedback received and technological development to reduce water exchange and consumptive water use, the CDC is also including intensive fresh water and brackish water aquaculture in the ADZ, in addition to the seawater aquaculture.

CONCEPTUAL LAYOUT AND MAIN COMPONENTS

The CDC has developed town plan for the ADZ, with marine species that require high volumes of seawater, such as abalone and seaweed in the lower lying coastal section and intensive recirculating aquaculture and a desalination plant on the higher lying inland areas (Figure 2).

The CDC has already received a number of letters of intent by private companies seeking to develop aquaculture projects in the SEZ. The CDC is in the process of developing the basic enabling infrastructure that will unlock the first 100 ha of the Coega ADZ (Figures 3 and 4). This phase of infrastructure development will be concluded in November 2021 and include roads, electricity, storm water, sewer, and potable water as none of these services was previously available in Zone 10.

Figure 2: Town plan of Coega ADZ in Zone 10 of the Coega SEZ.

Figure 3: Current infrastructure development in Zone 10

Figure 4: Prioritized area and infrastructure for Phase 1 of the Coega SEZ

CONCLUSION

The CDC is well on its way to provide an investment ready platform for aquaculture investors by ensuring that investors have access to affordable and well services sites adjacent to the ocean with all the necessary environmental authorisations.

The Coega ADZ is crucial in addressing the major unemployment and economic depression the region and the country find itself in. The project also addresses key environmental problems such as depletion of the wild stocks of abalone through poaching of the valuable abalone resources along the South African coastline.

THE TRIALS AND TRIUMPHS FACED DURING THE ESTABLISHMENT OF KINGFISH ENTERPRISE

With global populations increasing and more people relying on fish as a primary source of protein and others becoming increasingly aware of the health benefits of fish, the demand has never been greater. With this great demand also comes the increase in exploiting fish stocks. An economically, environmentally, and socially sustainable way of harvesting fish is needed to satisfy people's needs and alleviate some of the fishing pressure exerted on the ocean. That is precisely what Andre Bok strived to do when he started Kingfish Enterprise.

Andre Bok, the founder of Kingfish Enterprise located in East London, Industrial Development Zone (IDZ), started his pilot farm in 2009, where he farmed Yellowtail Kingfish *(Seriola lalandi)* and Dusky Kob *(Argyrosomas japonicus)*. To date, Bok has a BSc Honours in Fisheries and Aquaculture from the University of Rhodes; he then spent 18 months in Israel learning and gaining experience in fish farming. Andre also spent time in Cyprus, farming Seabream and Sea Bass, and then went to the USA. However, a background in science and aquaculture was not enough to run a successful aquaculture farm; Bok knew he needed a sound business background and studied part-time at Natal Technikon in the UK, where he obtained his MBA. During this time, he worked as an Aquarium Curator for Seaworld, currently known as uShaka Marine World in Durban. He later got experience working for Irvin and Johnson Ltd (I&J) at their aquaculture farms. With all his skills and qualifications,Andre still had major setbacks which he had to overcome.

Bok and his team of four scientists had many challenges initially. These challenges included seeing how fast the fish grew, how efficiently the fish would convert food to flesh, determining the appropriate stocking densities, and how the fish would sell commercially. One of the biggest problems was that the fish were not growing, which was perplexing for the team.

"It is obviously complex, and it has to do with the stocking rate and the feed rate in a system. The feed rate has to be adapted to the feeding response, or the food itself can become a pollutant. In addition, the more fish there are in a system, the more likelihood there is of the water getting polluted as a result of the nitrogen cascade," said Bok. "The toxicity of ammonia and nitrites to the fish, if the system is out of balance and these products, are not converted or eliminated" in this case, it seemed we were feeding the fish, but they weren't growing. They were using the food just for metabolic processes," he continued.

To solve the problem of the fish not growing Andre Bok started working on food formulations that affected the digestibility of food which increased the absorption rate of the feed, thus producing significantly less waste. "The water quality in the live-holding systems improved significantly as a result, and the fish started growing," he mentioned. This discovery led to Yellowtail fish growing from an egg to 2.5kg in 12 months.
Finally, after 30 years of effort, the first harvest produced half a tonne of Yellowtail Kingfish *(Seriola lalandi)* and 1.5 tonnes of Dusky Kob *(Argyrosomas japonicus)*, which was harvested in September 2021 for a high-end retailer, which will see this product being sold at Woolworths.

Gert Le Roux, the Aquaculture and Fisheries Specialist at Woolworths Foods, has confirmed that the product is sold at Woolworths, "Yes, we do sell the product, and the consumer is aware that the fish are farmed since we also sell other farmed products." A taste test was also conducted at Woolworths to see if there was a difference in the taste of farmed fish compared to wild caught fish and there was no difference or 'off' taste contrary to what consumers believed.

Through a serious of lows to finally achieving his life-long goal Kingfish Enterprise founder, Andre Bok expressed his fulfillment after the harvest "I feel like I have just crossed the finish line on the first of a lifelong marathon. I cannot say that I am excited or rewarded, I think the word to use is fulfilled". However, this was not only a feet of accomplishment for Andre it is a triumph for the entire aquaculture industry as well.

Kingfish Enterprise is now a fully functioning sustainable farm which does not use hormones, pesticides or any other chemicals to grow the fish but instead uses biological filters. These products are also listed on SASSI as a green choice because of the sustainable produce used for the feed and because the fish are grown in a recirculating aquaculture system (RAS).

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THE IMPACT OF COVID-19 ON THE ABALONE SECTOR

BACKGROUND

Globally, abalone is one of the most luxurious and expensive seafood products, with high demand specifically in the Asian countries due to the cultural, traditional, and medicinal qualities associated with it. The first captive spawning of abalone started in 1983, while the abalone industry was established in South Africa in the early 1990's. Since the 1990's, the abalone industry has been successfully producing farmed abalone for consumption (DAFF, 2018). Haliotis midae is one of five abalone species that are endemic to South Africa and is commonly known as the "perlemoen". In South Africa, the only farmed abalone species is the Haliotis midae, which has a flattened, ear-shaped shell with a wide opening at the base. The South African abalone industry has developed itself throughout the years, this can be seen in the well-developed value chain, which includes specifically developed abalone feed, selective breeding, and good spawning practices, right through to the well-established marketing channels (DAFF, 2018).

The South African abalone industry has developed at rapid rate in recent years (Figure 1), specifically in response to the demand; premium prices received for abalone; and the decreasing numbers of wild abalone stocks due to poaching. In South Africa, the rapid development of the industry can be linked to the favourable coastal conditions, a well- developed local value-chain, labour costs, infrastructure availability and the well-known reputation of South African abalone on the global markets (Troell, et al., 2006).

In terms of export market, the abalone market is dominated by China (35,5%) and South Korea (29,9%), Australia (25,66%), followed by South Africa (5,78,) which is the fourth largest abalone producer in the world (Tridge, 2022).

On the international market, South African abalone are well known for their high quality, good taste, textures, and colours. These characteristics have resulted in South African abalone becoming premium products that command high prices on the international market.

Abalone production in South Africa is found along the Eastern Cape, Western Cape and Northern Cape coastline, with 14 abalone farms in production in 2020. The abalone farms are distributed along the Cape coastline from the Northern Cape and Western Cape to the Eastern Cape. The farms are distributed as follows (DFFE, 2021 unpublished data):

- Northern Cape: Three (3) farms,
- Western Cape: Eleven (11) farms, and
- Eastern Cape: One (1) farm

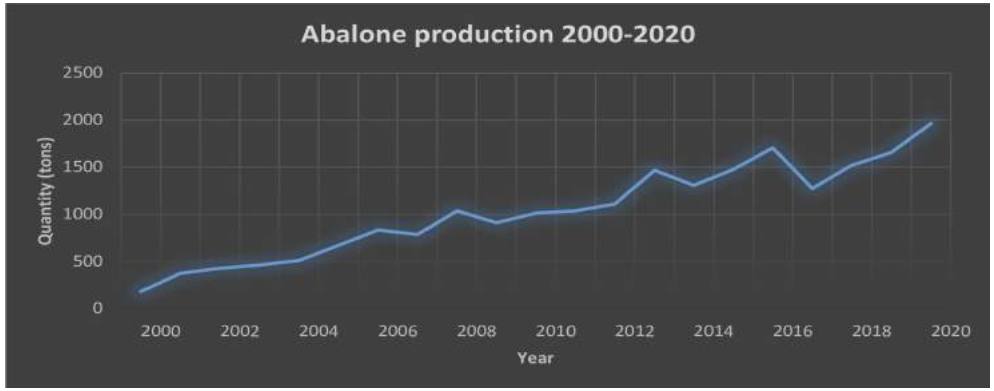
The total production of South Africa's aquaculture industry recorded during 2020 was 6 032.14 tons (excluding seaweed), with freshwater recording 1 477.33 tons (24.45%) and marine noted to be the main driver of the sector with 4 564.81 tons (75.55%) (DFFE, 2021 unpublished data).

During 2020, the abalone sub-sector production increased by 307.32 tons (18.55%) from 2019 (1 656.56 tons) recording a total of 1 963.85 tons. Favourable environmental conditions; research and development; farm expansions; and well-established infrastructure contributed to the continuous growth of this sector (DFFE, 2021).

This report provides a comparison of the abalone exported between 2019 and 2020 in order to unpack the impact of the COVID-19 pandemic on the abalone industry exports. The structure of the report will cover abalone production and exports over the last 10 years. Abalone exports was analysed from the Harmonised System (HS) code data that are provided by the South African Revenue Services (SARS) to classify different goods that are exported from South Africa and relies on monthly farm production reports for comparison.

Source: DFFE, 2021 unpublished data.

Figure 1: Abalone production 2000 – 2020.

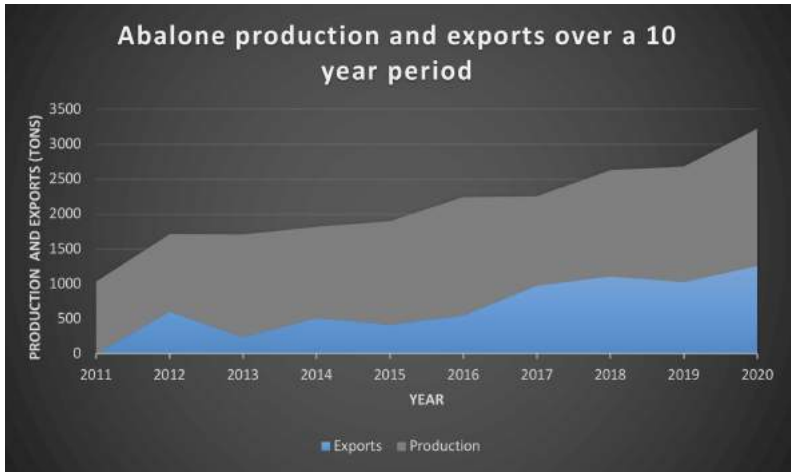


2. TOTAL EXPORTS COMPARISON BETWEEN 2019 AND 2020

Trends in total abalone production per annum mirrors the trends in tonnage of abalone exported (Figure 2, Table 1). Production from 2019 to 2020 increased by 18% from 1 656 tons to 1 963 tons. The tonnage exported between 2019 and 2020 increased by 23% from 1 025 tons to 1 261 tons exported. Exports dropped slightly between 2018 and 2019 (1 107 to 1 025 tons). *It should be noted that exports include all abalone exported from South Africa which is not limited to farmed abalone.*

Source: DFFE, 2020; DFFE, 2021 and Trademap, 2021.

Figure 2: Abalone production and exports over a 10-year period.



Source: DFFE, 2021.

Table 1: Abalone production and exports over a 10-year period in tons.

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Exports	-	601	235	511	419	543	978	1107	1025	1261
Production	1036	1111	1469	1306	1479	1703	1276	1522	1656	1963

2.1. QUANTITY AND PRICE PER PRODUCT TYPE (HS CODE)

The Harmonized System is a standardized numerical method of classifying traded products. It is used by customs authorities around the world to identify products when assessing duties and taxes and for gathering statistics. The Table 2 below provides the abalone specie: HS codes according to categories.

Source: Trademap, 2021.

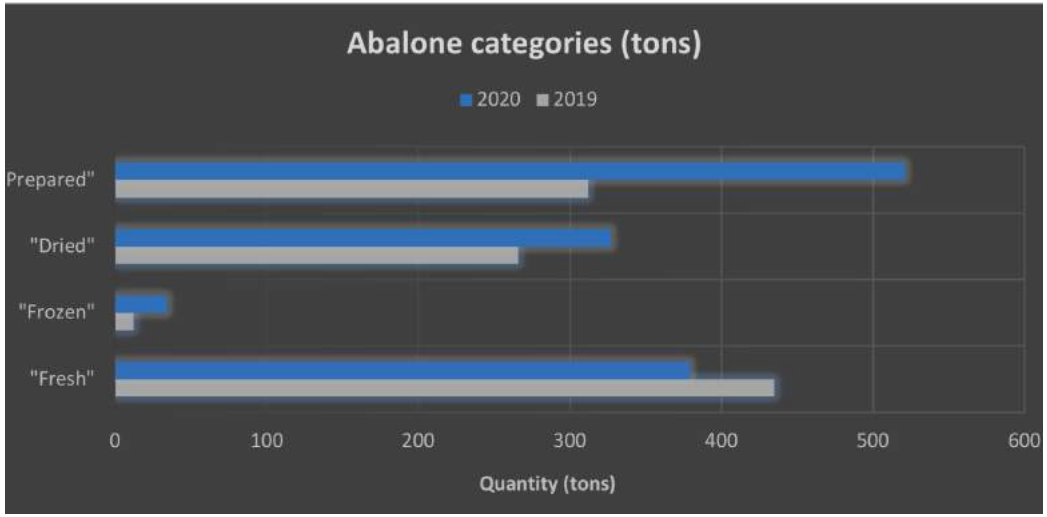
Table 2: Tariff codes.

TARIFF CODES		Referred to as
HS: 030781	**Live, fresh or chilled, abalone**	**"Fresh"**
HS: 030783	**frozen even in shell abalone**	**"Frozen"**
HS: 160557	**Abalone, prepared or preserved**	**"Prepared"**
HS: 030787	**Smoked, dried, salted or in brine, even in shell, abalone**	**"Dried"**

Figure 3 and Table 3 below illustrates the quantity of abalone exported by HS codes. "Prepared" abalone made up the majority of exported product in 2020. This was followed by "Fresh" abalone and "Dried" abalone. The least exported product was "Frozen" abalone during 2020. Although total exports increased from 2019 to 2020, less "Fresh" product was exported in 2020 compared to 2019 with a shift towards "Prepared" abalone.

Source: Trademap, 2021.

Figure 3: Quantity of abalone exported by HS codes.



Source: Trademap, 2021.

Table 3: Quantity of abalone (tons) exported by HS codes.

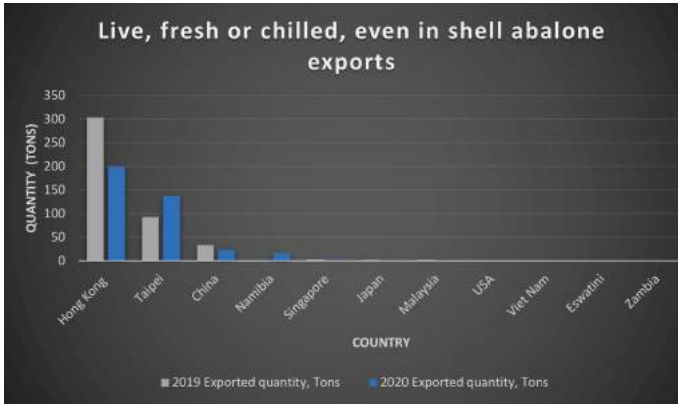
YEAR	2019	2020
030781 Live, fresh or chilled, even in shell, abalone	435	379
030783 Frozen, even in shell, abalone	12	34
030787 Smoked, dried, salted or in brine, even in shell, abalone	266	327
160557 Abalone, prepared or preserved (excluding smoked)	312	521
TOTAL	1 025	1 261

2.1.1. LIVE/FRESH AND CHILLED EXPORTS “FRESH”

According to Figure 4 and Table 4 below the top five importing countries of South African “fresh” abalone in 2020 were Hong Kong, followed by Taiwan, China, Namibia and Singapore. China’s imports of “fresh”, abalone decreased by 10 tons or 30% when compared to 2019 exports of 33 tons. Additionally, Hong Kong’s import of “fresh” abalone decreased in 2020 by 34% when compared with 2019 exports.

Source: Trademap, 2021.

Figure 4: Quantity of abalone exported *(030781 Live, fresh or chilled, even in shell, abalone)*



Source: Trademap, 2021.

Table 5: Live, fresh or chilled, even in shell, abalone *"Haliotis spp."* (2019)

Country	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
	tons	tons	tons	tons	tons	tons	tons	tons	tons	tons
Hong Kong	-	318	432	228	134	150	214	197	303	199
Taiwan	-	103	126	33	-	12	27	31	93	137
China	-	18	12	4	-	-	3	6	33	23
Namibia	-	1	-	-	1	0	1	-	-	17
Singapore	-	2	4	1	-	-	-	-	3	2
Japan	-	33	27	9	-	-	-	-	2	1
Malaysia	-	-	1	1	-	1	1	1	2	1
USA	-	-	-	-	-	-	-	-	-	-
Vietnam	-	5	-	-	-	-	-	-	-	-
Eswatini	-	-	-	-	8	-	-	-	-	-
Zambia	-	-	-	-	-	-	-	-	-	-

Table 5 and Table 6 shows the quantity, the value in dollars, unit price in rands and rands per kilogram of "fresh" abalone. The average exchange rate for 2019 and 2020 for dollar to rand was R14,44 and R16,47 respectively (Exchangerates.org.uk, 2022). In 2019 about 69% "fresh" abalone was imported by Hong Kong, followed by Taiwan with 21%, China with 8% and other countries combined imported 2%. Again in 2020 the majority of imports i.e. 52% of "fresh" abalone came from Hong Kong with 52% followed by Taiwan with 36% then China with 6% and all other countries combined with 6%. The weighted average price of "fresh" abalone exported decreased from R463 per kg in 2019 to R391 per kg in 2020. It has been noted that the 2020 price for 17 tons of abalone exported to Namibia is valued at 1 000 USD, which requires further investigation.

Source: Trademap, 2021.

Table 6: Live, fresh or chilled, even in shell, abalone *"Haliotis spp."* (2020)

Country	Quantity tons	Custom Value ($) per ton	Unit Price (Rands) per ton	Rands per kg
Hong Kong, China	303	$9 520 000,00	R453 692,41	R453,69
Taiwan	93	$3 167 000,00	R491 736,34	R491,74
China	33	$1 113 000,00	R487 021,82	R487,02
Singapore	3	$97 000,00	R466 893,33	R466,89
Japan	2	$41 000,00	R296 020,00	R296,02
Malaysia	2	$59 000,00	R425 980,00	R425,98
United States of America	0	$6 000,00	R-	
Total	**436**	**$14 003 000,00**		
Average (total value in rand/quantity)			**R 463 769,08**	**R 463.78**
Weighted average				**R463,57**

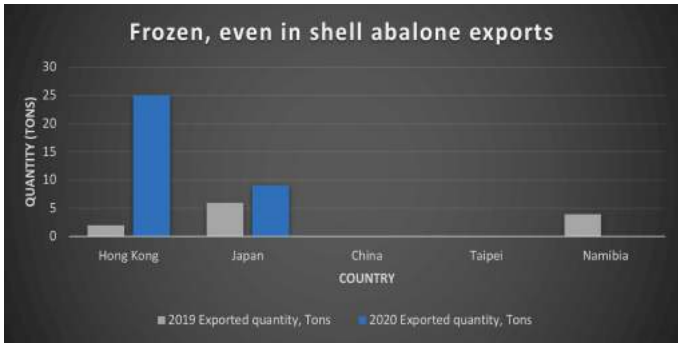
This image is supplied by HIK

2.1.2. FROZEN, EVEN IN SHELL, ABALONE EXPORTS (“FROZEN”)

The top three importing countries of South African “frozen” abalone in 2020 were Hong Kong, followed by Japan, and Namibia. Hong Kong’s exports of “frozen” increased by 23 tons in comparison to 2 tons exported in 2019. This is over 100% increase as compared to 2019 exports during 2019 (Figure 5 and Table 7).

Source: Trademap, 2021.

Figure 5: Quantity of abalone exported *(030781 Live, fresh or chilled, even in shell, abalone)*



Source: Trademap, 2021.

Table 7: Quantity of abalone exported (030783 Frozen, even in shell, abalone).

Country	2012	2013	2014	2015	2016	2017	2018	2019	2020
	tons	tons	tons	tons	tons	tons	tons	tons	tons
Hong Kong	-	-	-	-	-	1	4	2	25
Japan	-	-	-	-	-	-	-	6	9
China	-	-	-	-	-	-	-	-	-
Taiwan	-	-	-	-	-	-	1	-	-
Namibia	-	-	-	-	-	-	-	4	-

Source: Trademap, 2021.

Table 8: Frozen, even in shell, abalone “Haliotis spp.”(2019)

Country	Quantity tons	Custom Value ($) per ton	Unit Price (Rands) per ton	Rands per kg
Hong Kong, China	2	$200000,00	R1 444 000,00	R1 444,00
Japan	6	$156000,00	R375 440,00	R375,44
China	0	$15000,00	R-	R-
Taiwan	0	$17000,00	R-	R-
Namibia	4	$78000,00	R722 000,00	R722,00
Total	**12**	**$466000,00**		
Average (Total value in Rand/ tons)			R560 753.33	**R560.75**
Weighted Average price				**R669,05**

Source: Trademap, 2021.

Table 9: Frozen, even in shell, abalone “Haliotis spp.”(2020)

ntry	Quantity tons	Custom Value ($) per ton	Unit Price (Rands) per ton	Rands per k
g Kong, China	25	$968000,00	R637 718,40	R637,72
an	9	$218000,00	R1 771 440,00	R1 771,44
na		$24000,00	R-	R-
al	**34**	**$1210000,00**		
rage (total value in d/ quantity)			**R586 138.23**	**R586.13**
ighted average price				**R937,82**

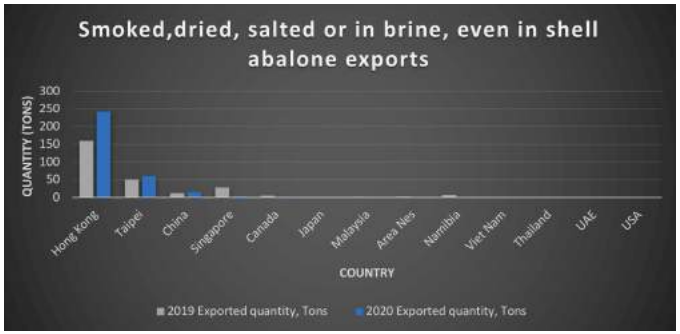
The below Table 8 and 9 indicate the quantity in tons, value in dollars, unit price in rand and price per kg for 2019 and 2020 for “frozen” abalone. In terms of quantity 50% of “frozen” abalone was imported by Japan, followed by Namibia with 33%, Hong Kong with 17% in 2019. In 2020 approximately 74% of “frozen” abalone was imported by Hong Kong followed by China with 26%. Furthermore the weighted average price in 2019 was R669 and R937 in 2020. The weighted average price is being impacted by the price for Japan which was R375 in 2019 and R1 771 in 2020, further investigation is required to understand the difference between these prices for product exported to Japan.

2.1.3. SMOKED, DRIED, SALTED OR IN BRINE, EVEN IN SHELL, ABALONE EXPORTS (“DRIED”)

Table 10 and Figure 6 below indicate the top five importing countries of “dried” abalone in 2020. These were Hong Kong, followed by Taiwan, China, Singapore and Canada. In 2020 there was a significant increase in imports of “dried” abalone from Hong Kong, from 160 tons to 243 tons. This is a 52% increase when compared to 2019 data. In contrary Singapore’s import of “dried” abalone decreased by a significant 86%.

Source: Trademap, 2021.

Figure 6: Quantity of abalone exported (030787 Smoked, dried, salted or in brine, even in shell, abalone).



Source: Trademap, 2021.

Table 10: Quantity of abalone exported (030787 Smoked, dried, salted or in brine, even in shell, abalone).

Country	2012	2013	2014	2015	2016	2017	2018	2019	2020
	Exported quantity, tons	Exported quantity, tons	Exported quantity, tons	Exported quantity, tons	Exported quantity, tons	Exported quantity, tons	Exported quantity, tons	Exported quantity, tons	Exported quantity, tons
Hong Kong, China	-	-	-	-	-	352	392	160	243
Taiwan	-	-	-	-	-	115	109	51	61
China	-	-	-	-	-	2	3	12	15
Singapore	-	-	-	-	-	9	12	28	4
Canada	-	-	-	-	-	-	1	5	2
Japan	-	-	-	-	-	3	4	-	1
Malaysia	-	-	-	-	-	2	3	1	1
*Area Nes	-	-	-	-	-	-	-	2	-
Namibia	-	-	-	-	-	-	-	7	-
Viet Nam	-	-	-	-	-	1	-	-	-
Thailand	-	-	-	-	-	-	-	-	-
UAE	-	-	-	-	-	1	-	-	-
USA	-	-	-	-	-	-	-	-	-

* The partner “Areas NES (not elsewhere specified)” is used (a) for low value trade and (b) if the partner designation was unknown to the reporting country or if an error was made in the partner assignment. The reporting country does not send International Trade Centre the details of the trading partner in these specific cases. Sometimes reporters do this to protect company information. Trademap 2021.

According to Table 11 and 12 below 74% of “dried” abalone was imported by Hong Kong, followed by Taiwan with19%, China with 5% and other countries combined imported 2%. It is estimated that weight of “dried” abalone is roughly 10% of whole “fresh” abalone with shell (production weight). The price per kg whole abalone tables 11 and 12 below is reflected to compare prices between products, considering the weight loss during processing. It has been noted the price to Taiwan for 2019 (R498,60) and 2020 (R376,38) is very low, in comparison to the price obtained from Hong Kong, which requires further investigation. The average price decreased by 17% percent from 2019 to 2020. It should be noted that price per whole abalone is around R80 to R100 compared to price for “frozen” and “fresh”.

Source: Trademap, 2021.

Table 11: Smoked, dried, salted or in brine, even in shell, abalone *"Haliotis spp."*(2019)

Country	Quantity tons	Custom Value ($) per ton	Unit Price (Rands) per ton	Rands per kg	Price per kg whole abalone (fresh)
Hong Kong, China	160	$14742000,00	R1 330 465,50	R1 330,47	R133,05
Taiwan	51	$1761000,00	R498 604,71	R498,60	R49,86
China	12	$695000,00	R836 316,67	R836,32	R83,63
Singapore	28	$1115000,00	R575 021,43	R575,02	R57,50
Canada	5	$333000,00	R961 704,00	R961,70	R96,17
Malaysia	1	$37000,00	R534 280,00	R534,28	R53,43
Area Nes	2	$52000,00	R375 440,00	R375,44	R37,54
Namibia	7	$328000,00	R676 617,14	R676,62	R67,66
Thailand	0	$11000,00	R-	R-	R-
United States of America	0	$18000,00	R-	R-	R-
Total	**266**	**$19092000,00**			
Average			**R 1 036 422.86**	**R1 036.42**	**R 103. 6**
Weighted average price				**R1 034,85**	

Source: Trademap, 2021.

Table 12: Smoked, dried, salted or in brine, even in shell, abalone *"Haliotis spp."* (2020)

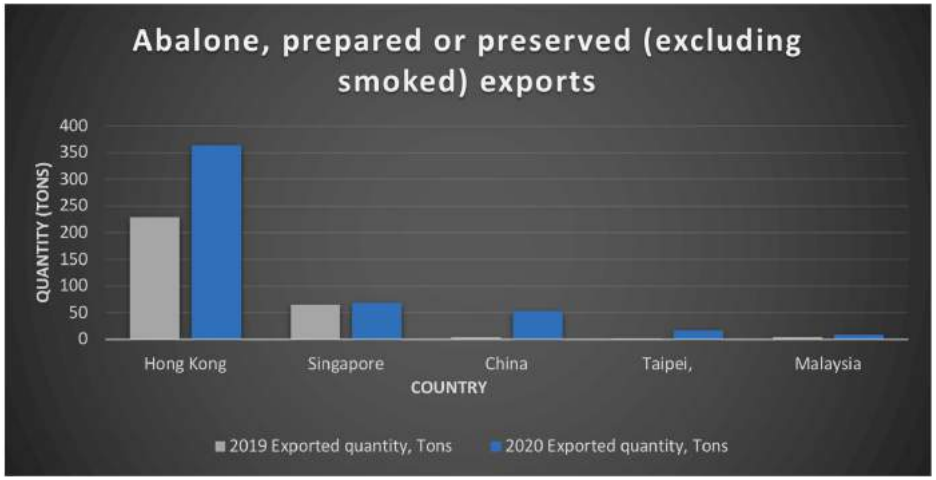
Country	Quantity tons	Custom Value ($) per ton	Unit Price (Rands) per ton	Rands per kg	Price per kg whole abalone (fresh)
Hong Kong, China	243	$14764000,00	R1 000 671,11	R1 000,67	R100,07
Taiwan	61	$1394000,00	R376 380,00	R376,38	R37,64
China	15	$366000,00	R401 868,00	R401,87	R40,19
Singapore	4	$188000,00	R774 090,00	R774,09	R77,41
Canada	2	$174000,00	R1 432 890,00	R1 432,89	R143,29
Japan	1	$90000,00	R1 482 300,00	R1 482,30	R148,23
Malaysia	1	$33000,00	R543 510,00	R543,51	R54,35
Total	**327**	**$17009000,00**			
Average			**R 856 691.83**	**R856.69**	**R 86.67**
Weighted average price				**R856,69**	

2.1.4. ABALONE, PREPARED OR PRESERVED (EXCLUDING SMOKED) EXPORTS

In 2020 the top five importing countries for "prepared" abalone were Hong Kong, Singapore, followed by China, Taiwan and Malaysia. Figure 7 and Table 13 below indicates that all top five importing countries imports of "prepared" abalone have increased; especially Hong Kong, China and Taiwan's imports of "prepared" abalone.

Source: Trademap, 2021.

Figure 7: Quantity of abalone exported (160557 Abalone, prepared or preserved (excluding smoked).

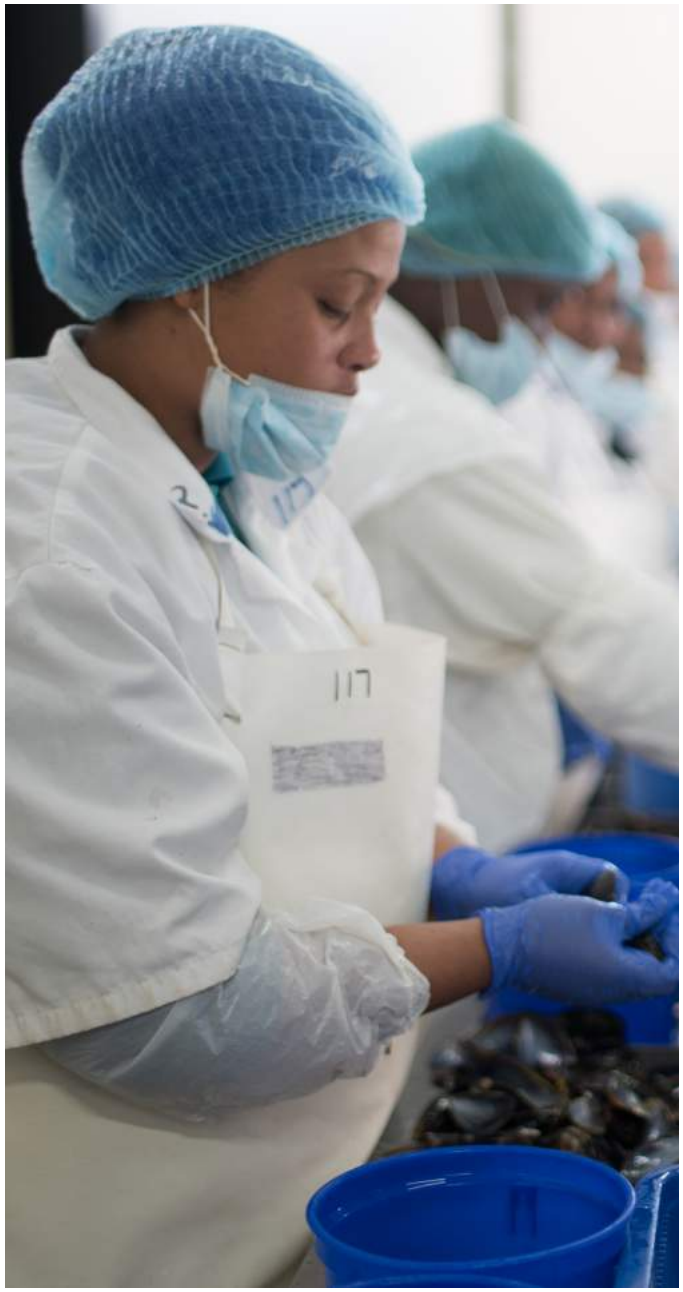


Source: Trademap, 2021.

Table 13: Quantity of abalone exported *(160557 Abalone, prepared or preserved (excluding smoked)*

Country	2012 tons	2013 tons	2014 tons	2015 tons	2016 tons	2017 tons	2018 tons	2019 tons	2020 tons
Hong Kong	118	203	185	226	311	183	248	229	364
Singapore	1	16	35	39	48	55	80	65	69
China	-	-	4	3	1	-	8	4	53
Taiwan	-	-	1	6	3	2	2	2	17
Malaysia	-	14	4	3	17	5	4	4	9
Macao,	-	-	-	-	-	1	2	7	5
Canada	-	-	-	-	-	-	-	-	3
USA	-	-	-	-	-	-	-	1	1
Japan	-	-	-	-	-	-	-	-	-
Mauritius	-	-	4	-	-	-	-	-	-
Seychelles	-	2	-	-	-	-	-	-	-

According to Table 14 and 15 below about 73% of “prepared” abalone was imported by Hong Kong, followed by Singapore with 21% and other countries combined imported 5%. It is assumed that “prepared” abalone is approximately 30% of whole live abalone weight for price comparison purposes. The average price of “prepared” abalone decrease by 29% from 2019 to 2020 from R713.76 to R502.49 per kg. The average price per kg of “whole fresh weight” translates to ranged from around R200 to R150 per kg. This is more than “dried” product but still significantly less than what farms get for “fresh” product.



Source: Trademap, 2021.

Table 14: Abalone, prepared or preserved (excluding smoked) (2019)

Country	Quantity (tons)	Custom Value ($)	Unit Price (Rands)	Price per kg	Price per kg whole abalone (fresh)
Hong Kong, China	229	$12317000,00	R776 670,22	R776,67	R 233,00
China	4	$161000,00	R581 210,00	R581,21	R174,36
Singapore	65	$2042000,00	R453 638,15	R453,64	R136,09
Taiwan	2	$145000,00	R1 046 900,00	R1 046,90	R314,07
Malaysia	4	$265000,00	R956 650,00	R956,65	R287,00
Macao, China	7	$447000,00	R922 097,14	R922,10	R276,63
United States of America	1	$45000,00	R649 800,00	R649,80	R194,94
Total	**312**	**15422000,00**			
Average			R713 761,79	**R713,75**	**R214.13**
Weighted average price				**R713,76**	

Source: Trademap, 2021.

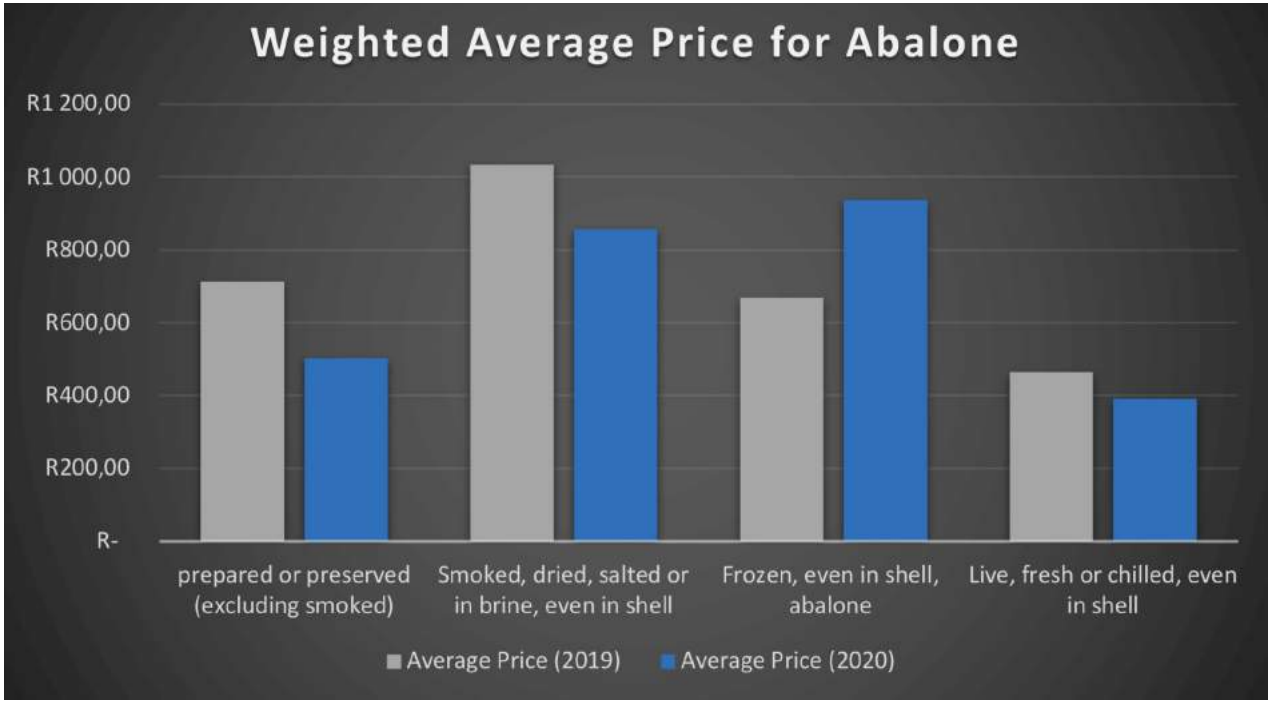
Table 15: Abalone, prepared or preserved (excluding smoked)

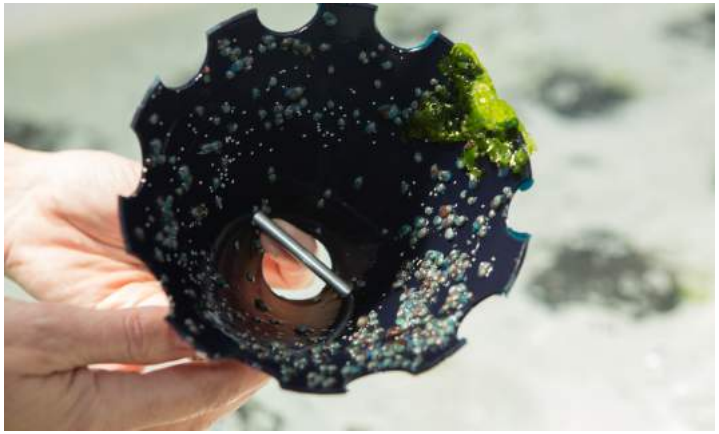
Country	Quantity (tons)	Custom Value ($)	Unit Price (Rands)	Rands per kg	Price per kg whole abalone (fresh)
Hong Kong	364	$11397000,00	R515 682,94	R515,68	R154,70
China	53	$1983000,00	R616 226,60	R616,23	R184,87
Singapore	69	$1378000,00	R328 922,61	R328,92	R98,68
Taiwan	17	$411000,00	R398 186,47	R398,19	R119,46
Malaysia	9	$326000,00	R596 580,00	R596,58	R178,97
Macao, China	5	$200000,00	R658 800,00	R658,80	R197,64
Canada	3	$170000,00	R933 300,00	R933,30	R279,99
United States of America	1	$61000,00	R1 004 670,00	R1 004,67	R301,40
Total	**521**	**$15926000,00**			
			R503 457,24	**R503, 46**	**R151.04**
Weighted average price				**R502,49**	**R150.75**

2.2. WEIGHTED AVERAGE PRICE FOR ABALONE BETWEEN 2019 AND 2020

Figure 8 below shows that in terms of weighted average price for abalone, the weighted average price for 2019 was higher for “prepared”, “dried” and “fresh” abalone categories compared to 2020, by (17%, 9% and 8% respectively). Although, “frozen” abalone weighted average price categories was 17% higher in 2020 as compared to 2019.

Figure 8: Weighted average price for abalone between 2019 and 2020



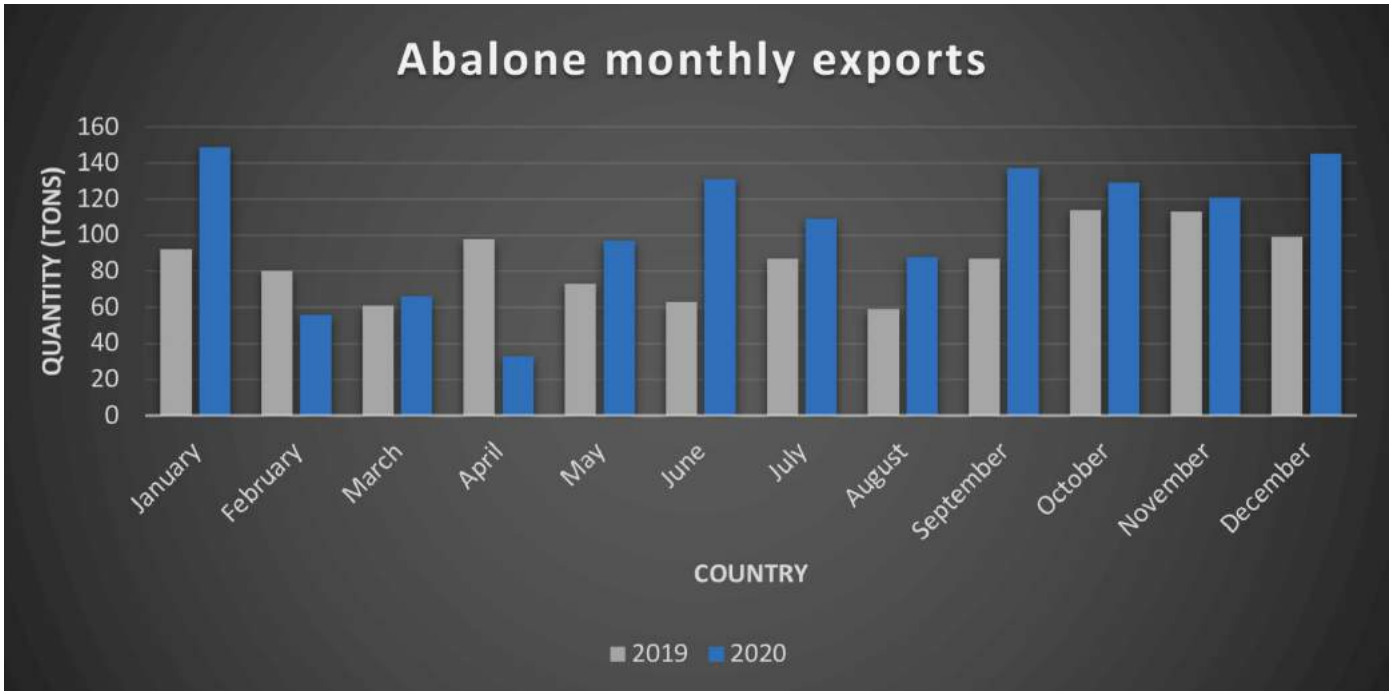


2.3. ABALONE MONTHLY EXPORTS BETWEEN 2019 AND 2020

It is important to note that from Figure 9 and Tables 16 and 17 below there was not much difference in terms of quantity exported in both 2019 and 2020. Contrary, it is notable that exports of South African abalone have been increasing when compared to 2019 data with the exception of the month of April 2020 which corresponded with the first lockdown of South Africa due to COVID-19. Abalone exports decreased significantly by 66% in April 2020 which is most likely due to flight restrictions during that period as South Africa was in level 5 lockdown.. In 2020, abalone exports from May picked up in comparison to 2019 exports. It should be noted that political unrests in Hong-Kong started in June 2019 which may be construing the comparison and further analysis of monthly exports of 2018 would be required. However, total export between 2018 and 2019 did not differ significantly.

Source: Trademap, 2021.

Figure 9: Abalone monthly export.



Source: Trademap, 2021.

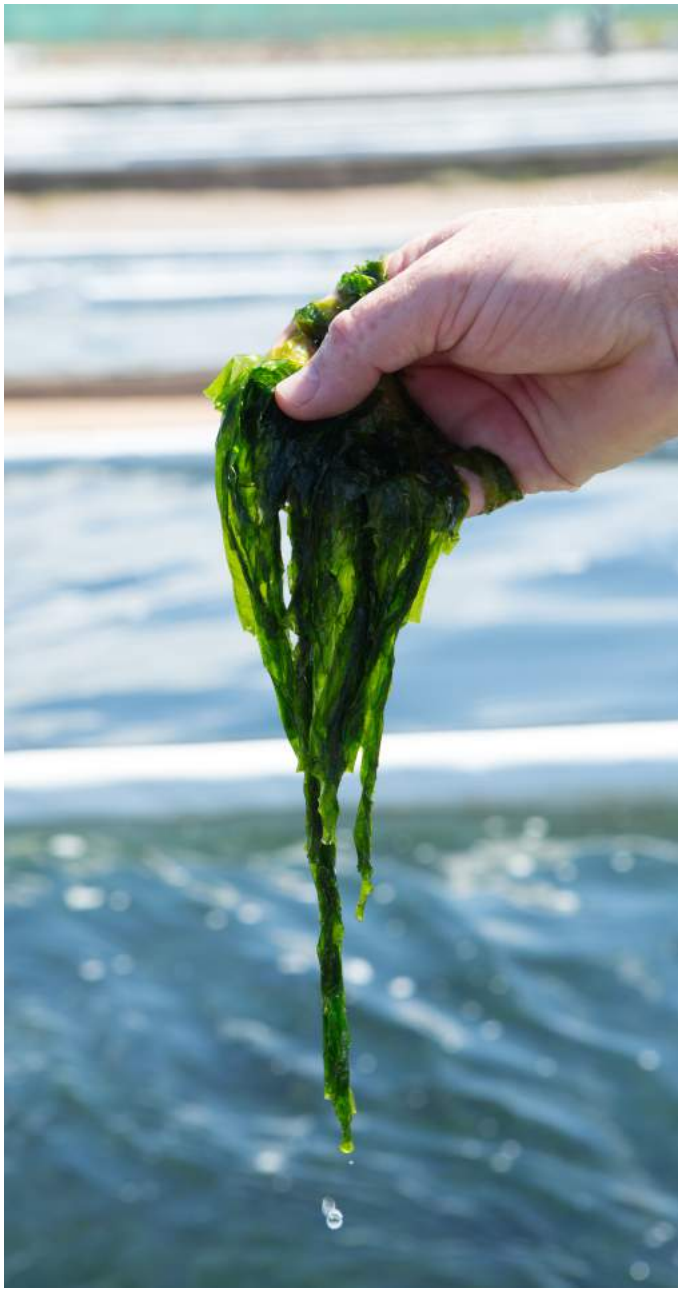
Table 16: 2019 total abalone monthly exports

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
tons	92	80	61	98	73	63	87	59	87	114	113	99

Source: Trademap, 2021.

Table 17: 2020 total abalone monthly exports

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
tons	149	56	66	33	97	131	109	88	137	129	121	145



3. CONCLUSION

In closing, abalone production has been increasing steadily over the years. It was expected that exports would decrease as a result of the COVID-19 outbreak; however, the data shows that abalone exports increased in 2020 when compared to 2019. Export in April 2020 was significantly lower than other months, most likely due to transport and flight limitations as a result of the COVID-19 pandemic. The products exported shifted slightly from “fresh” abalone in 2019 to “prepared” abalone in 2020. Additionally, Hong Kong was the top importing country of all the abalone products, followed by Taiwan. The COVID-19 outbreak that started in China in December 2019 may have been the contributing factor in decreasing exports. It should be noted that political unrest in Hong-Kong started in June 2019 which negatively impacted the abalone export market. While export volumes increased, it is clear that price reduced for “prepared” abalone by 17%, “dried” abalone by 9% and “fresh” abalone by 8% compared to 2020. Although, “frozen” abalone weighted average price categories was 17% higher in 2020 as compared to 2019.

3.

3. ADVERTISEMENT: A CALL FOR NEW PROJECTS

3. ADVERTISEMENT: A CALL FOR NEW PROJECTS

The Department of Forestry, Fisheries and the Environment hereby invites 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

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@dffe.gov.za or call Ms Bongiwe Gxilishe on 021 402 3322.

NUMBER	CRITERIA	WEIGHT
One	Marketing	30%
Two	Funding	15%
Three	Readiness for production	15%
Four	Scale	15%
Five	Technical Expertise	25%

CONTACT DETAILS

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