



REPUBLIC OF SOUTH AFRICA



# Operation Phakisa: unlocking the economic potential of South Africa's oceans

## Aquaculture

Executive Summary

15 August 2014

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## Executive summary

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1.2 Overview of the aquaculture sector

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## Quick glance

The aquaculture lab undertook the task of **unlocking the potential of the aquaculture sector in South Africa**. The goal is to grow aquaculture so that it can play a major role in the supply of fish products and an enhanced role in job creation and contribution to national income

South Africa's aquaculture sector **has high growth potential** due to increasing demand for fish in the face of declining fish stocks in the ocean and South Africa's abundance of marine and freshwater resources. The sector also offers significant potential for rural development, especially for the marginalised coastal communities

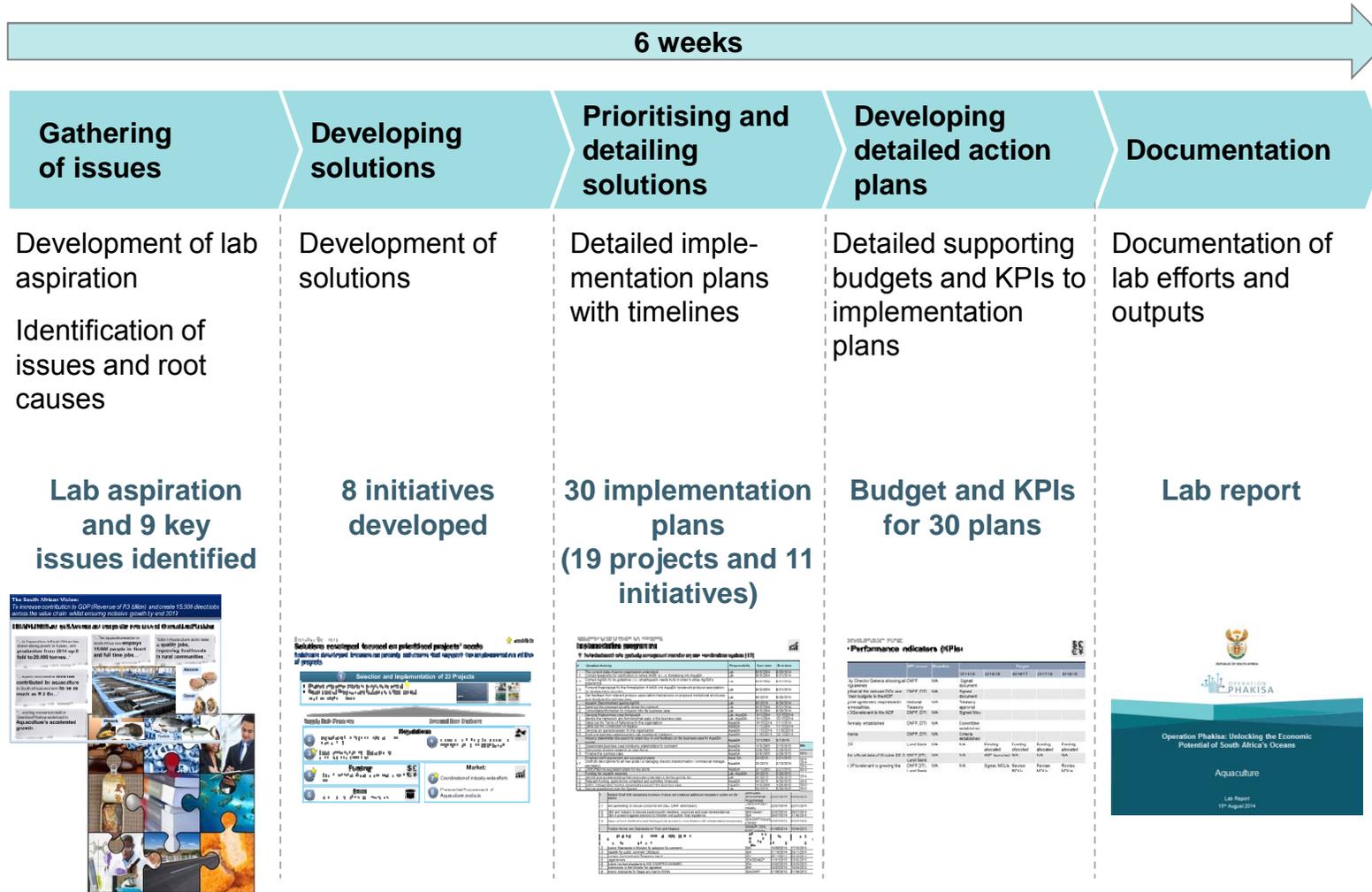
**The aquaculture lab aims to increase** sector revenue from ZAR 0.67 billion to ZAR 3 billion production by 20,000 tonnes and jobs from 2,227 to 15,000 and ensure increased participation to support transformation in the sector

Currently, the **sector in South Africa is at a very small scale and faces a number of challenges**. Production is focussed on a few high-value species, such as abalone, oysters, mussels, finfish and trout – driven mainly by the high cost of production. Other challenges include regulatory barriers, difficulty in accessing funding, poor access to markets, limited pool of skills, poor access to quality inputs, fragmented R&D, limited infrastructure in rural areas and inclusivity in the sector

The lab identified **8 key initiatives, which are expected to spur the growth of the sector**. One initiative will address the selection and implementation of 24 projects, improving both the number and productivity of the new farms. 3 initiatives relate to the creation of an enabling regulatory environment, and others focus on funding support, increasing skills pool and awareness as well as improving access to markets

To deliver on 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 aquaculture lab worked for 6 weeks to identify issues and develop solutions and action plans



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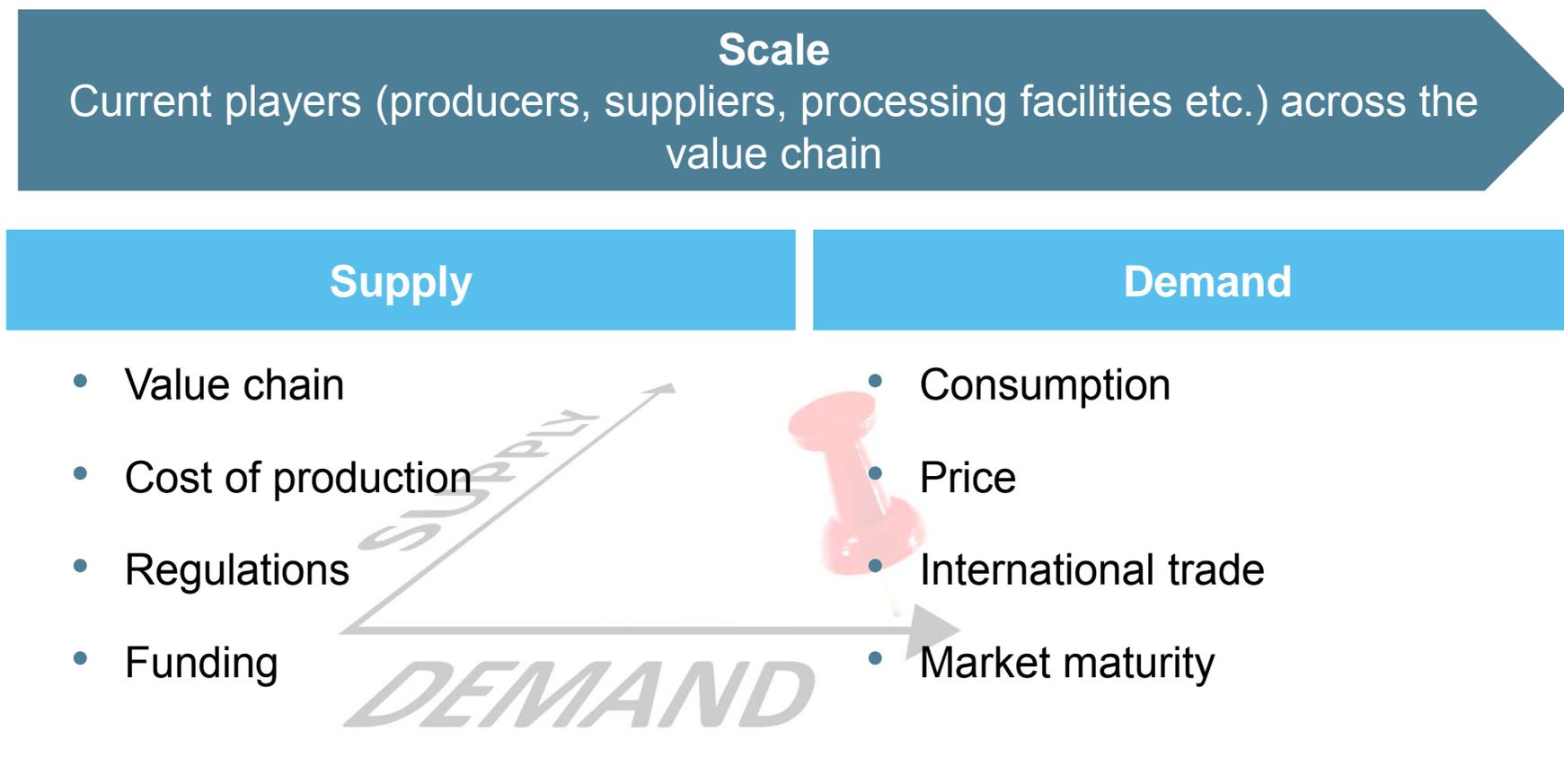
## Executive summary

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- 1.2 Overview of the aquaculture sector**
- 1.3 Overview of issues
- 1.4 Overview of initiatives

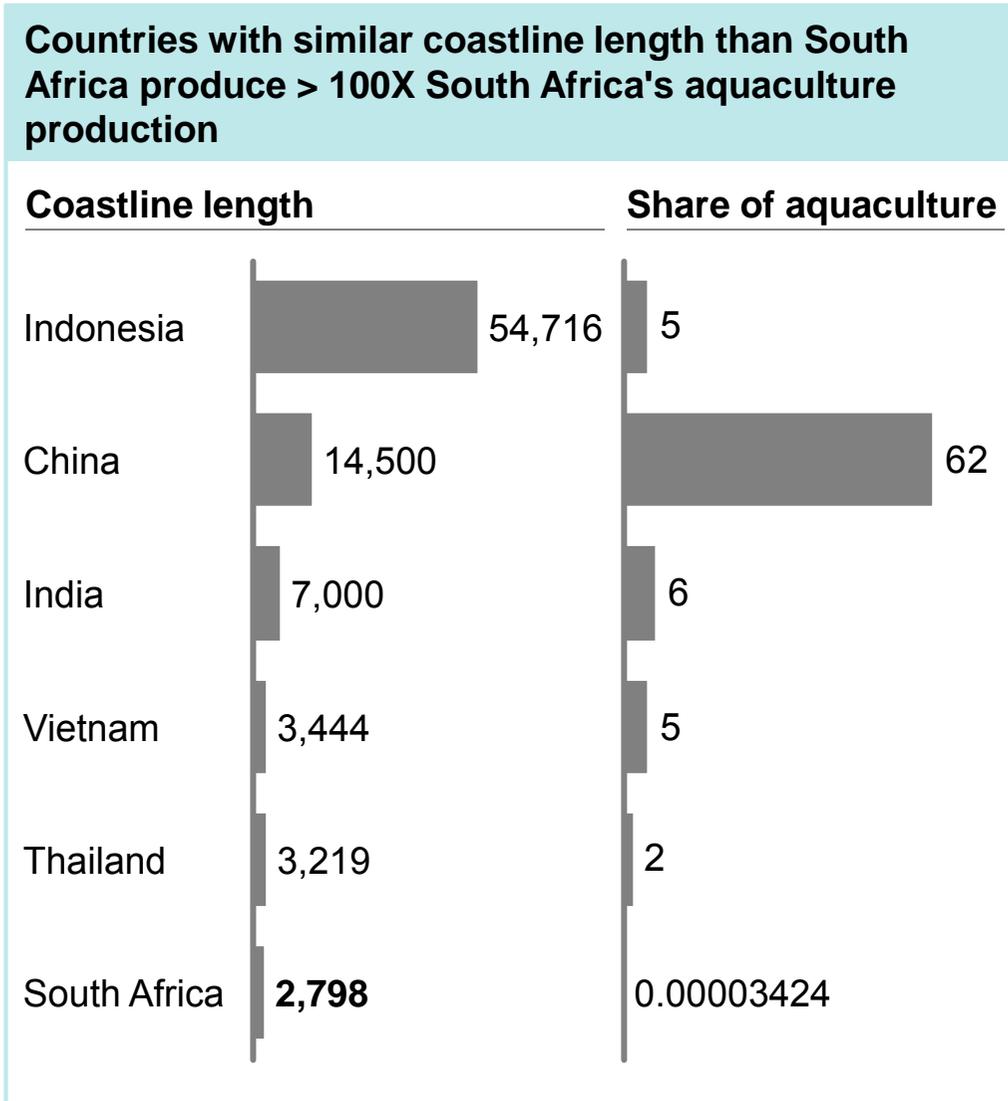
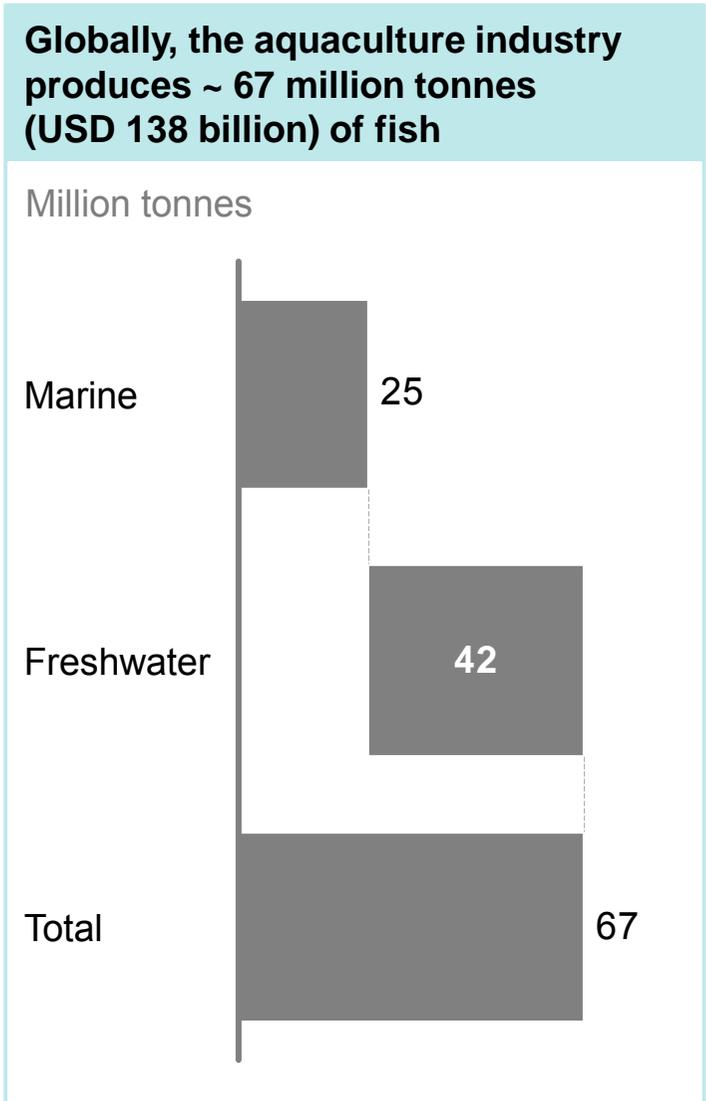


## Overview of the aquaculture sector

The aquaculture sector in South Africa is nascent and sub-scale. In order to fast-track growth and development, aquaculture will need to rapidly increase scale of production and stimulate demand in local and international markets



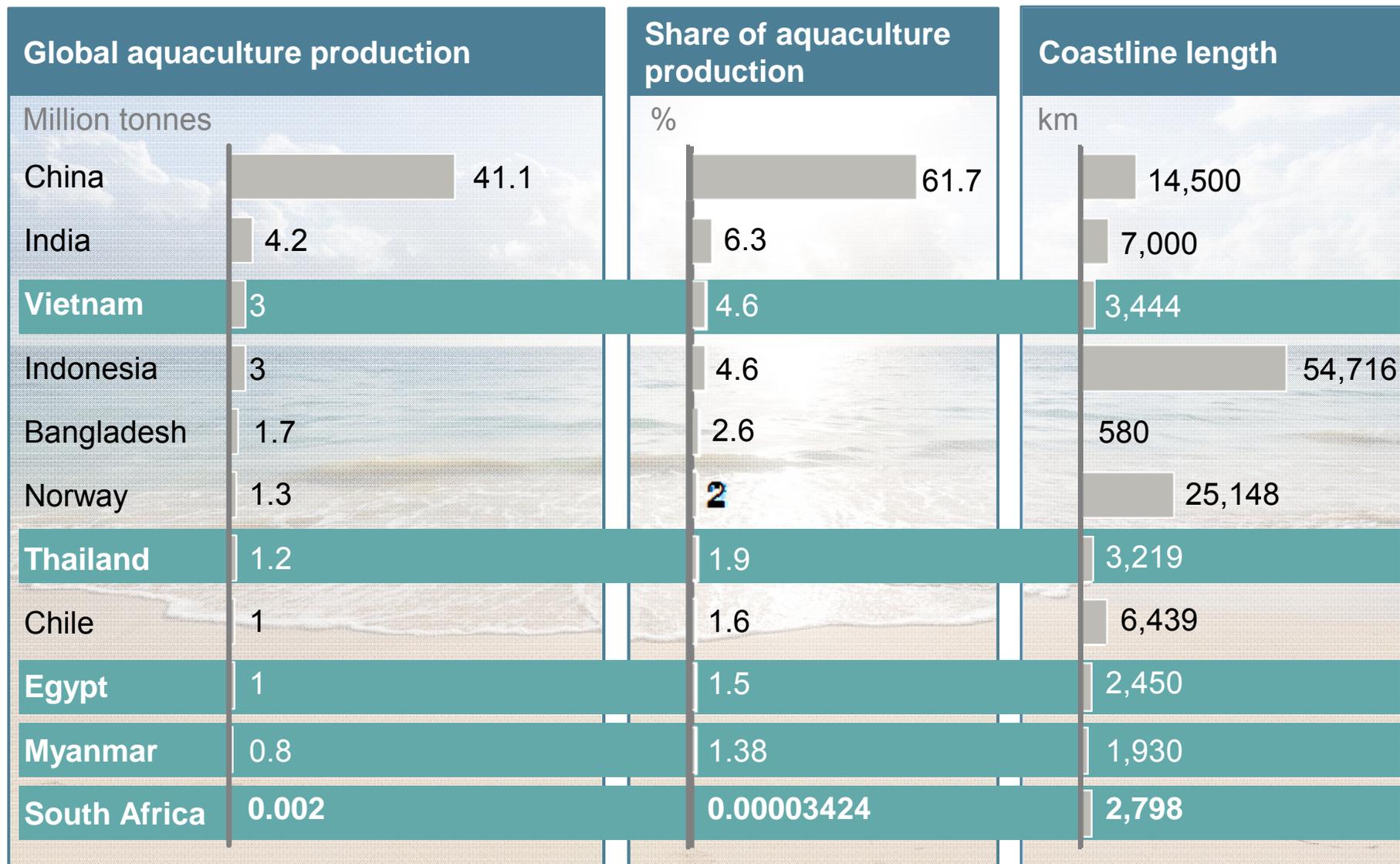
# Global aquaculture industry produces ~ 67 million tonnes, with South Africa contributing 0.00003% of global production



# Nations with similar coastline length are producing ~ 1,000X South Africa's aquaculture production volume



**Nations with similar coastline length as South Africa**



SOURCE: FAO State of World Fisheries and Aquaculture 2014; CIA World Factbook

# Globally, the aquaculture sector has contributed significantly to important socio-economic priorities



## Job creation

- **Egypt employs 580,000 people in its aquaculture sector** (more than all other African countries combined)
- In many developing countries, **labour-intensive processing methods** provide livelihood support for many poor, rural economies
- **Over 80% of aquaculture farmers in Asia are small scale**; often represents the only source of income
- **Small-scale aquaculture enterprises are major contributors to food production** in many developing countries
- **Contributions of small-scale aquaculture enterprises** to poverty alleviation and food security **have received significant global attention**, e.g., Rio+20 UN conference

## Human capital development

- **Several countries**, e.g., the US, Norway, the Philippines **provide training, bachelor's degrees and advanced degrees** in Aquaculture Studies
- In countries where there is considerable competition for positions in the industry, **advanced degrees are frequently required for positions in research or management**

## Gender equality

- **Aquaculture is a new industry in Developing countries**, and women are making valuable contributions
- Division of labour between men and women varies by scale of operation
  - **Small-scale aquaculture: women provide 46% of total labour** (marine – 36% women, inland – 54% women)
  - **Examples:** Sri Lanka – 90% women, Uruguay – 52% women, Brazil – 57% women

# In South Africa however, aquaculture is a young industry with a low scale of production



~ **4,000** tonnes  
(excluding seaweed) of  
aquaculture production in 2013  
(28% freshwater, 72% marine)

~ **50%** of aquaculture  
farms in South Africa are located  
in the **Western Cape**

**Untransformed sector**  
with 10% PDI participation at the  
management level in the sector

In 2012, > **600,000**  
tonnes of fish and fish products  
were produced in South Africa;  
only **0.8%** of it was from  
aquaculture farms

**2,227** jobs in the sector

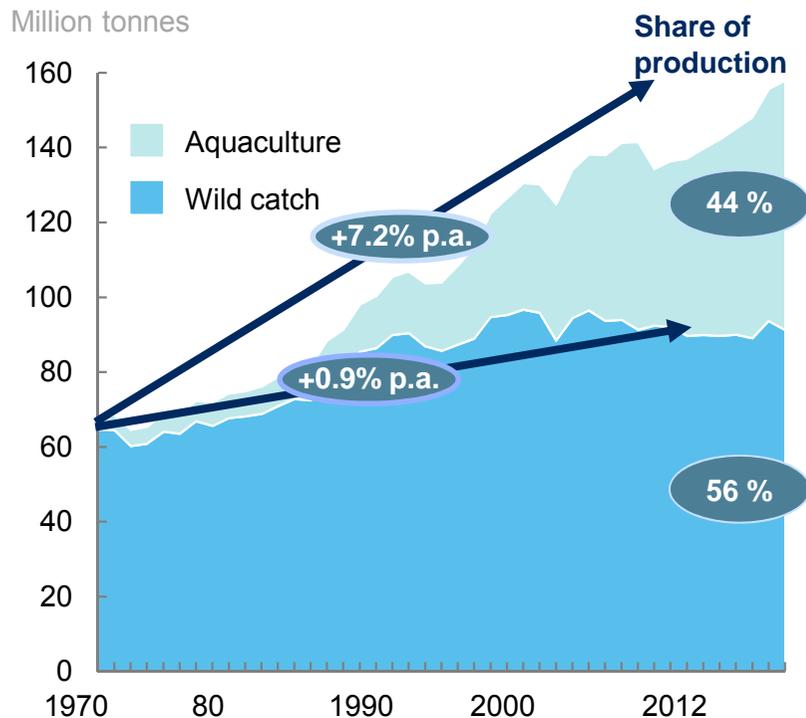
Aquaculture contributes  
~ **ZAR 0.7 billion**  
(0.2%) to South Africa's GDP

# Globally, aquaculture contributes to almost half of total fish (?) supply

Aquaculture is playing an increasingly important role in fish production, as projections indicate wild capture production has plateaued



Global total fish production<sup>1</sup> – wild catch and farmed (reported)



- Aquaculture production has shown strong growth of 7.2% p.a. from 1970 to 2012
- Currently, aquaculture accounts for almost half of total fish production<sup>1</sup>
- Asia accounts for 88% of global aquaculture production

## Factors influencing supply

### Supplementing wild capture within maximum sustainable yields

- The need to employ sustainable fishing methods has become more important due to dwindling stocks of certain species
- FAO has classified most wild fisheries as either fully exploited or overexploited
- Increasing demand for fish products

### Better technologies and production methods

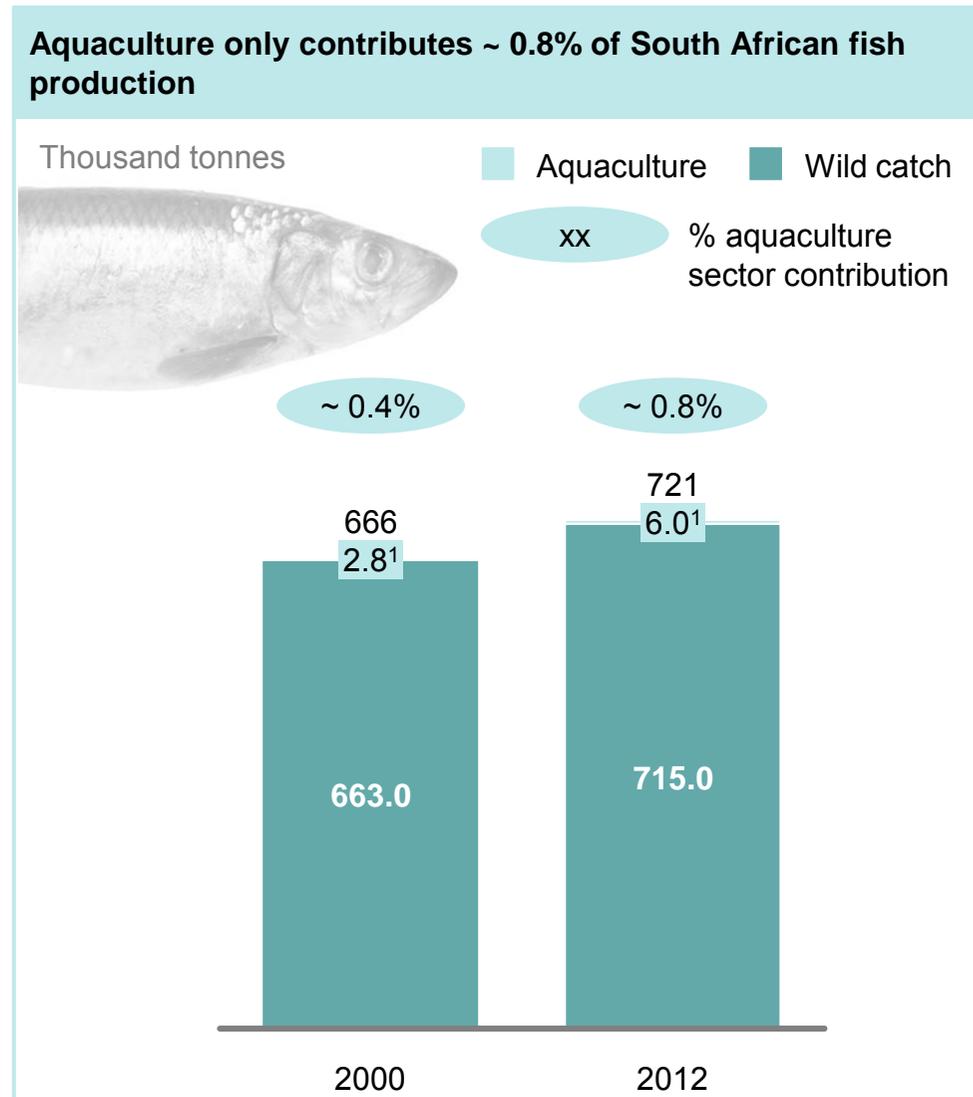
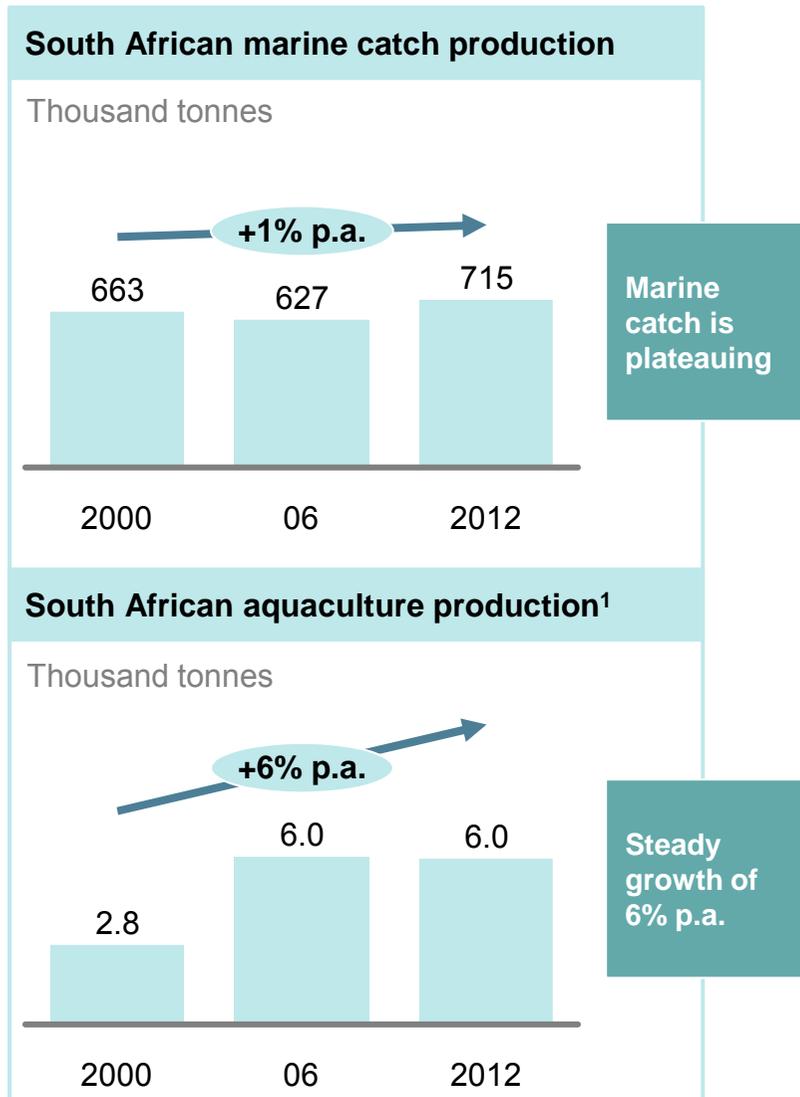
- New technologies and breeds, e.g., RAS system and GIFT strain for tilapia, has enabled better yields and lower long-term input costs
- Higher stocking capacity for shrimps, which allows for higher yield
- Investment in R&D

### Food security

- Governments have a responsibility to ensure that everyone has enough to eat
- Food needs to be available, accessible and affordable through a resilient and reliable supply system
- Fish is regarded as an essential part of a healthy and nutritious diet

<sup>1</sup> Fish production refers to fish and shellfish production

# Fish stocks in South Africa are declining; however, the aquaculture sector contributes little to the total supply of fish products



<sup>1</sup> The total production includes 2,000 tonnes of seaweed

SOURCE: FAO State of World Fisheries and Aquaculture 2014; FishStatJ; DAFF

# Global demand for fish products is projected to grow by 48% in 20 years, with aquaculture expected to meet more than half of demand



## Fish consumption to increase with growing world population and increasing diet concerns

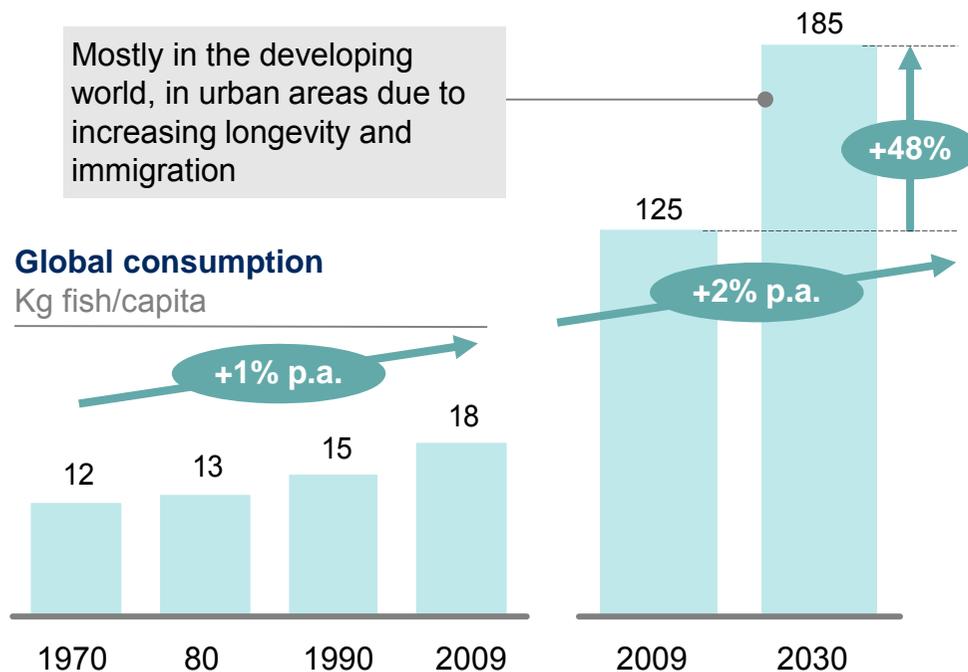
### Fish consumption forecast

Million tonnes

Mostly in the developing world, in urban areas due to increasing longevity and immigration

### Global consumption

Kg fish/capita



## Influencing factors of demand

### Rising global population

- Global population growing at 1.1% p.a., projected to reach 8.6 billion in 2033
- Static-capture fisheries' production unable to meet rising global demand

### Movement towards healthier diets in wealthier countries

- Fish provides not only high-value protein, but also a wide range of essential micronutrients, including various vitamins (D, A and B), minerals (including calcium, iodine, zinc, iron and selenium) and polyunsaturated omega-3 fatty acids
- FSA recommends at least 2 portions of fish per week

### Greater product use

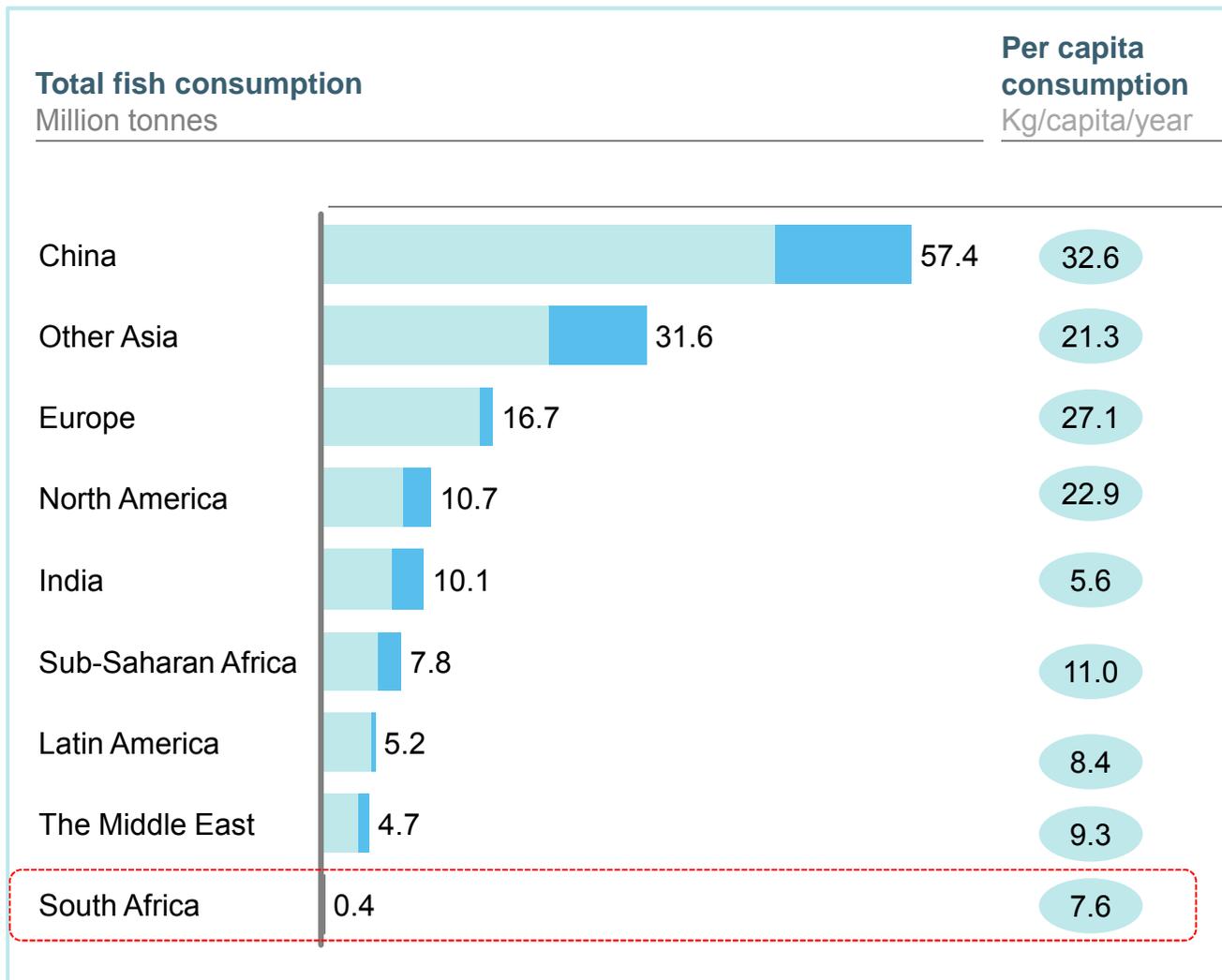
- Seaweed is used as gelling agent for various processed food and pharmaceutical products, e.g., toothpaste and chocolate

### Increasing demand for premium products

- Growing affluence, especially in the Middle East and Asia, has led to growth in premium products, e.g., grouper – U.S. FDA has classified carrageenan (seaweed) as an organic product

# South African fish consumption is projected to grow at a significantly lower rate than the rest of the world

2010 2030

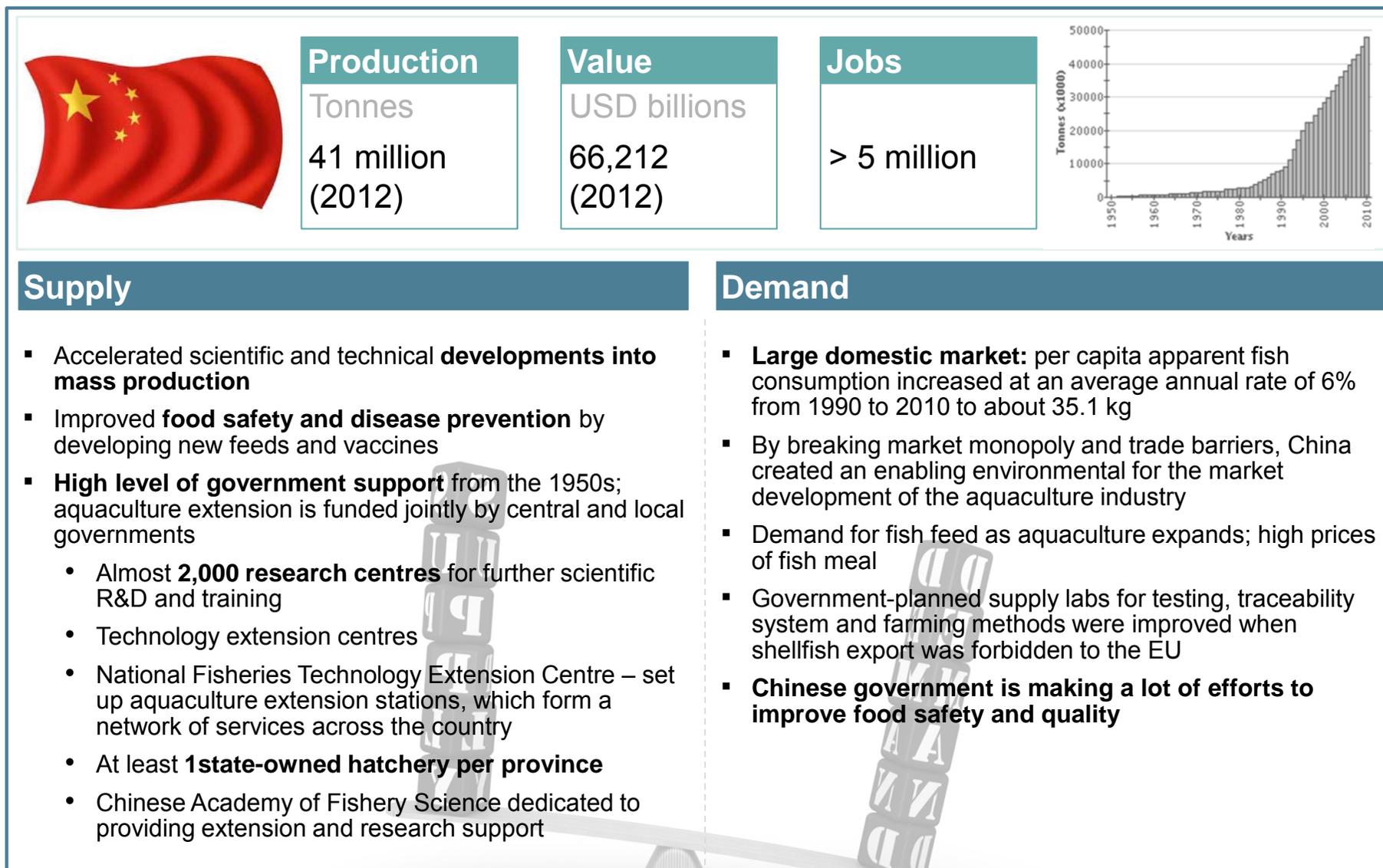


**Fish consumption in South Africa is projected to grow at a much slower pace than in other countries, despite DoH's guidelines<sup>1</sup> promoting fish as a healthy source of protein**

1 DoH: food-based dietary guidelines of South Africa

SOURCE: Fish to 2030; DoH

## China used R&D to increase supply and facilitated market expansion locally and internationally



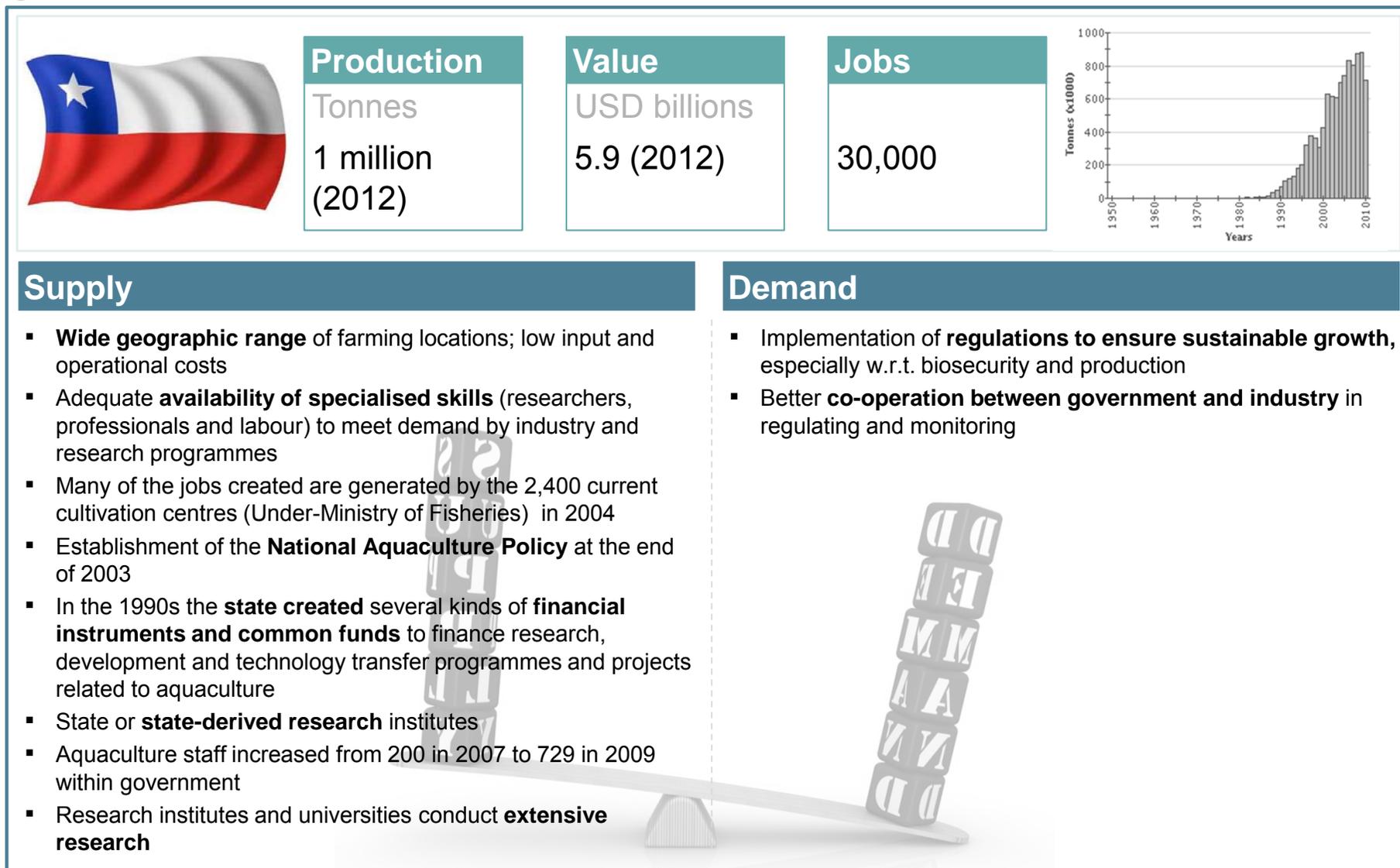
### Supply

- Accelerated scientific and technical **developments into mass production**
- Improved **food safety and disease prevention** by developing new feeds and vaccines
- **High level of government support** from the 1950s; aquaculture extension is funded jointly by central and local governments
  - Almost **2,000 research centres** for further scientific R&D and training
  - Technology extension centres
  - National Fisheries Technology Extension Centre – set up aquaculture extension stations, which form a network of services across the country
  - At least **1 state-owned hatchery per province**
  - Chinese Academy of Fishery Science dedicated to providing extension and research support

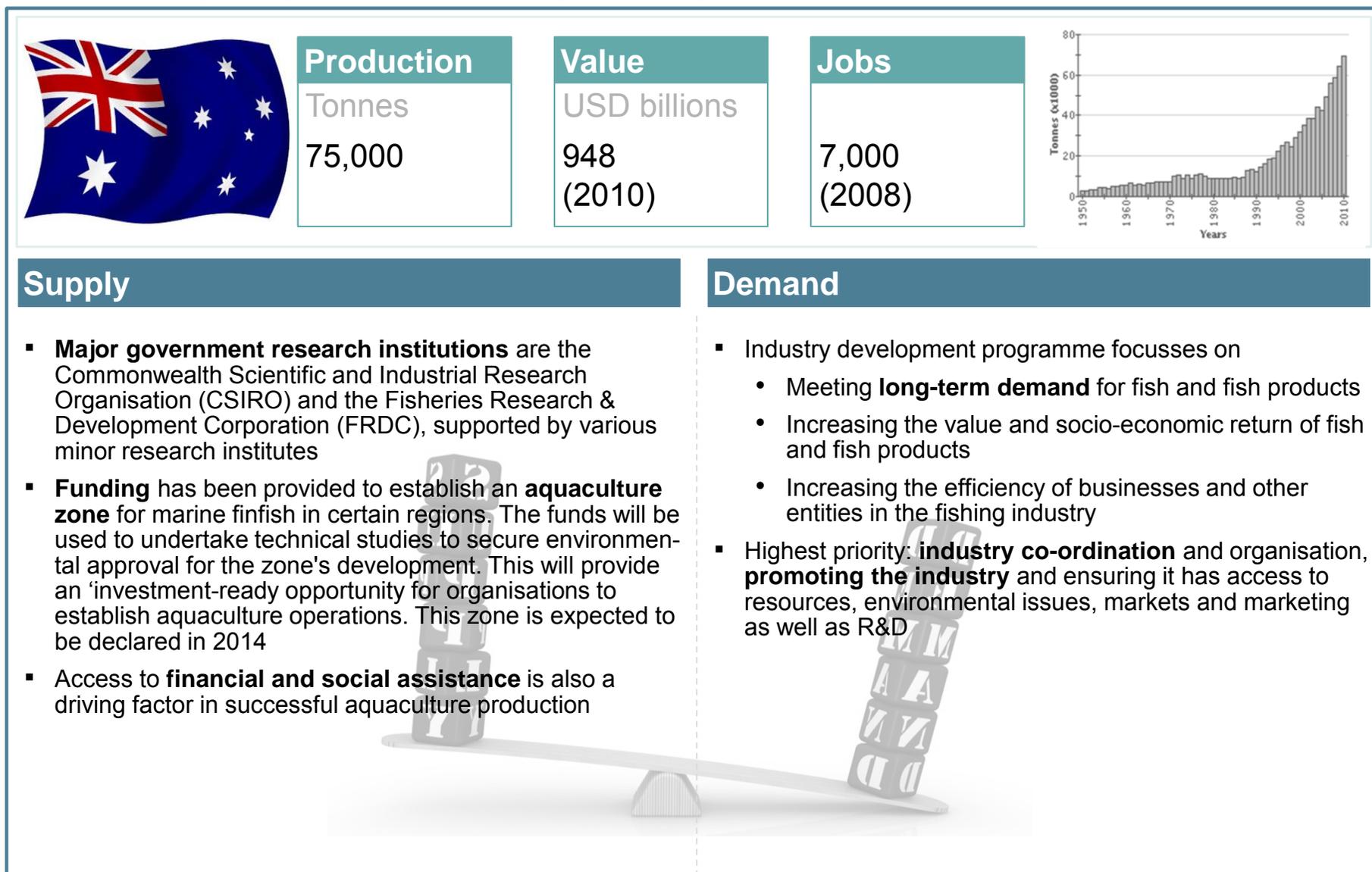
### Demand

- **Large domestic market:** per capita apparent fish consumption increased at an average annual rate of 6% from 1990 to 2010 to about 35.1 kg
- By breaking market monopoly and trade barriers, China created an enabling environment for the market development of the aquaculture industry
- Demand for fish feed as aquaculture expands; high prices of fish meal
- Government-planned supply labs for testing, traceability system and farming methods were improved when shellfish export was forbidden to the EU
- **Chinese government is making a lot of efforts to improve food safety and quality**

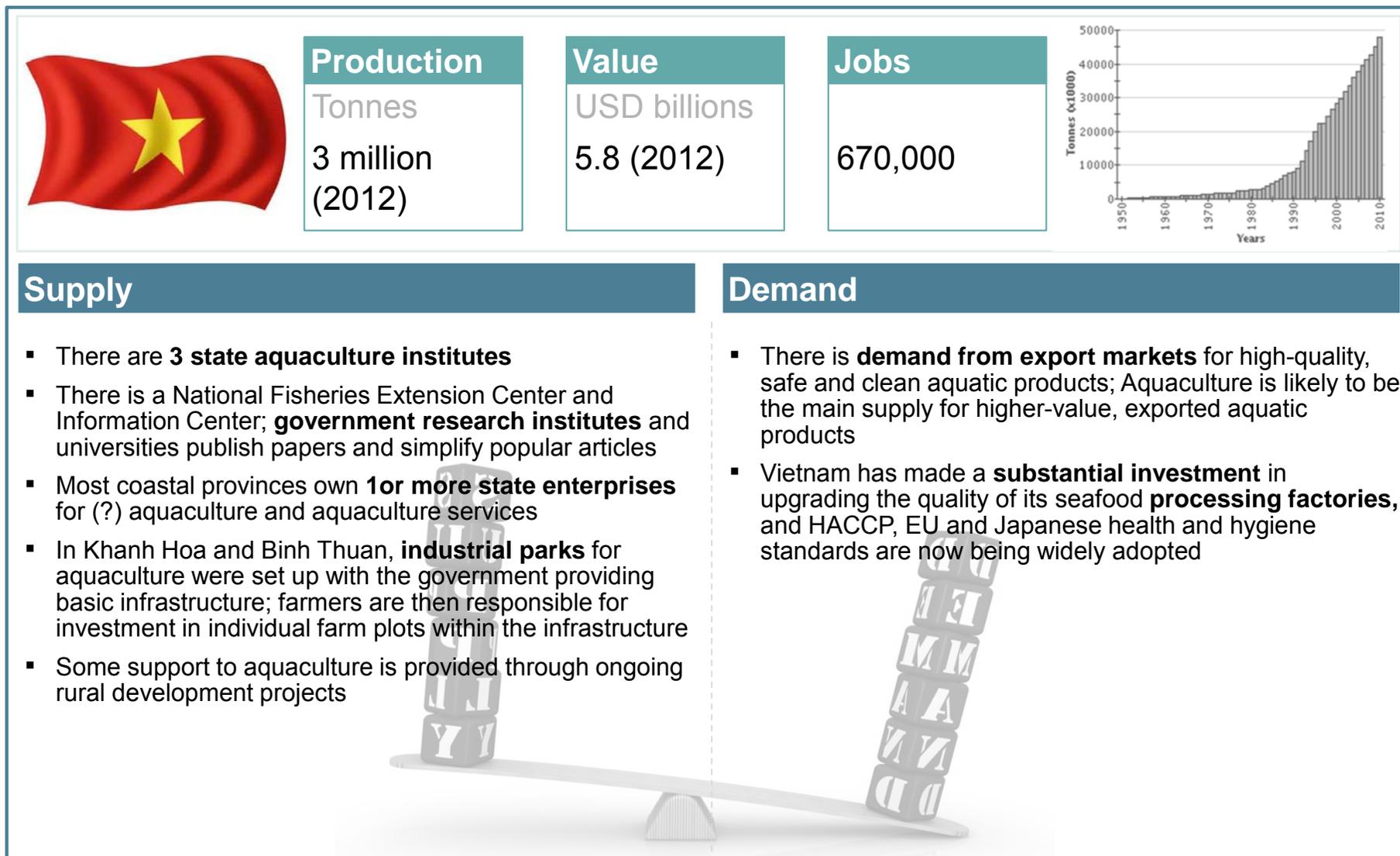
## Chile focussed largely on supply factors to stimulate aquaculture sector growth



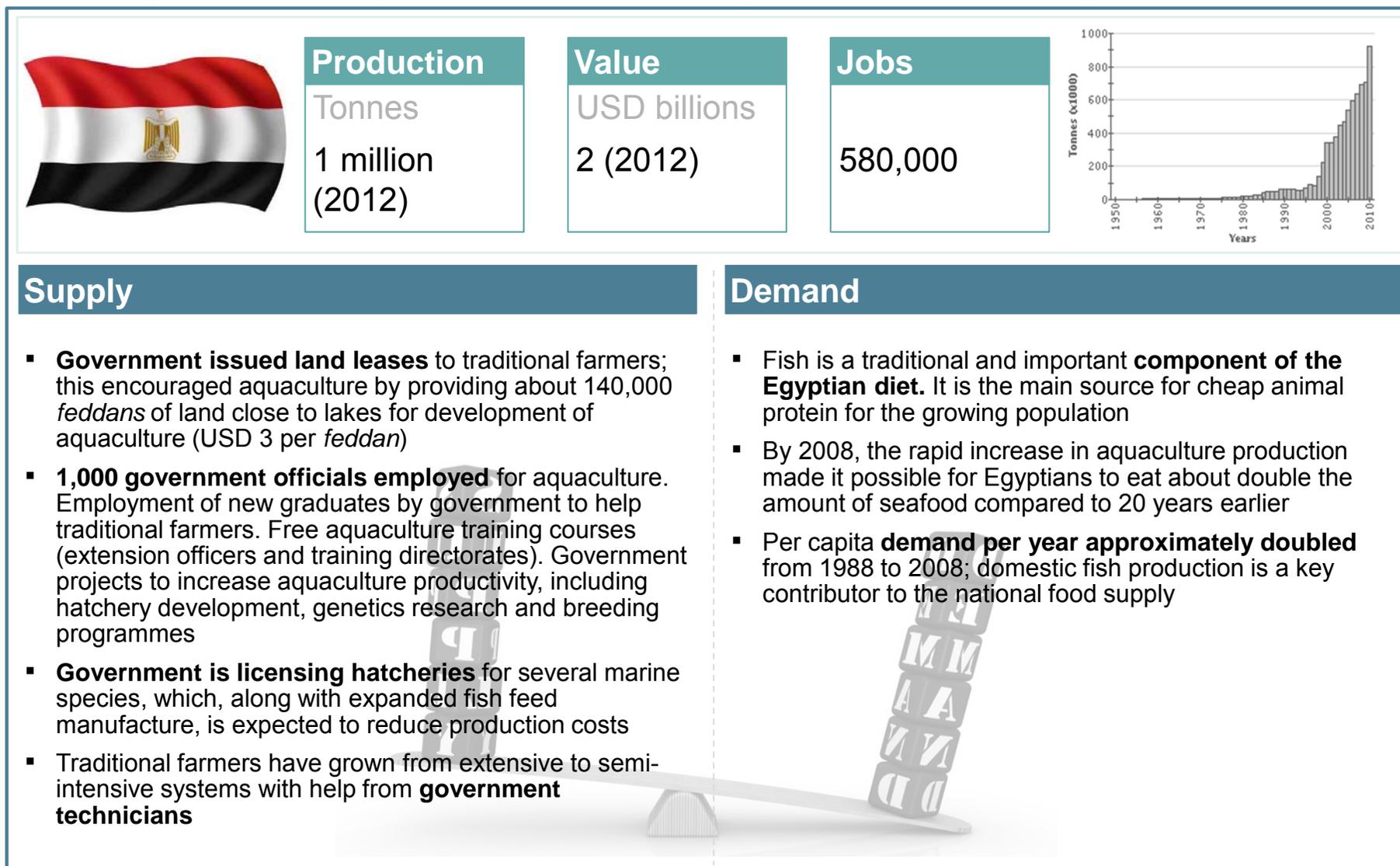
## Australia focussed on financial and R&D programmes to increase supply while using targeted marketing strategies to increase demand



## Vietnam launched comprehensive, government-led programmes to rapidly stimulate aquaculture production

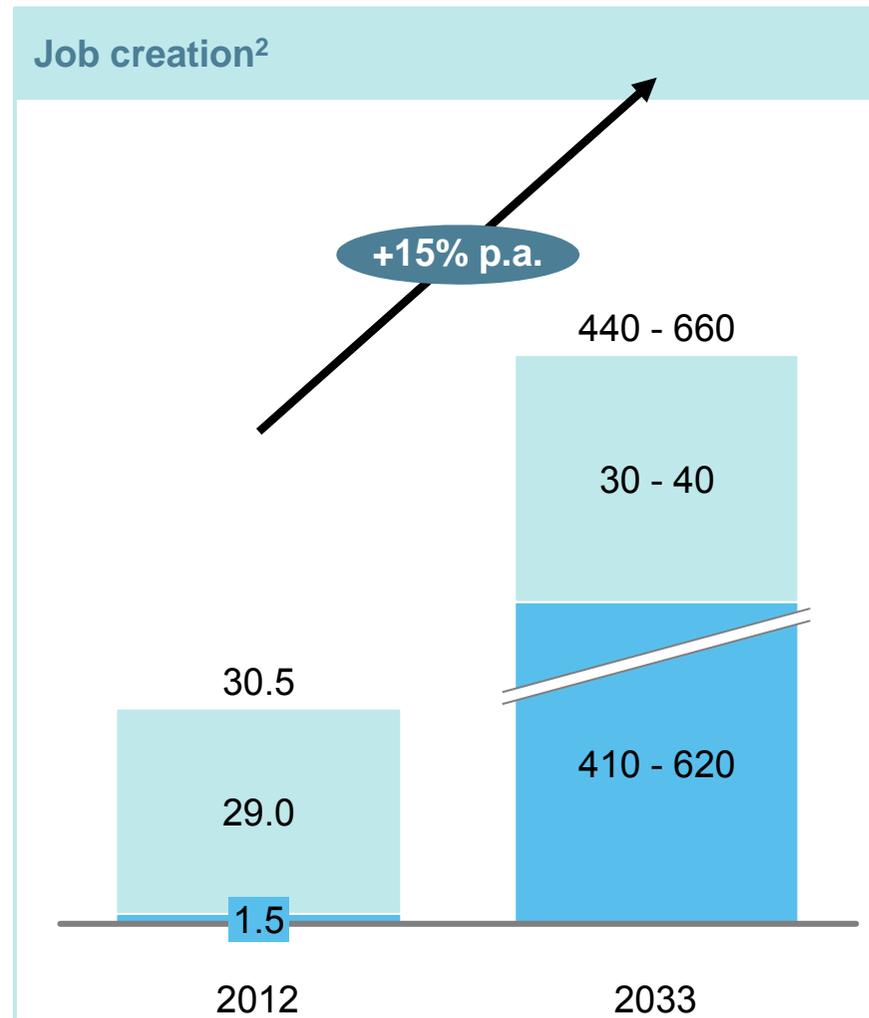
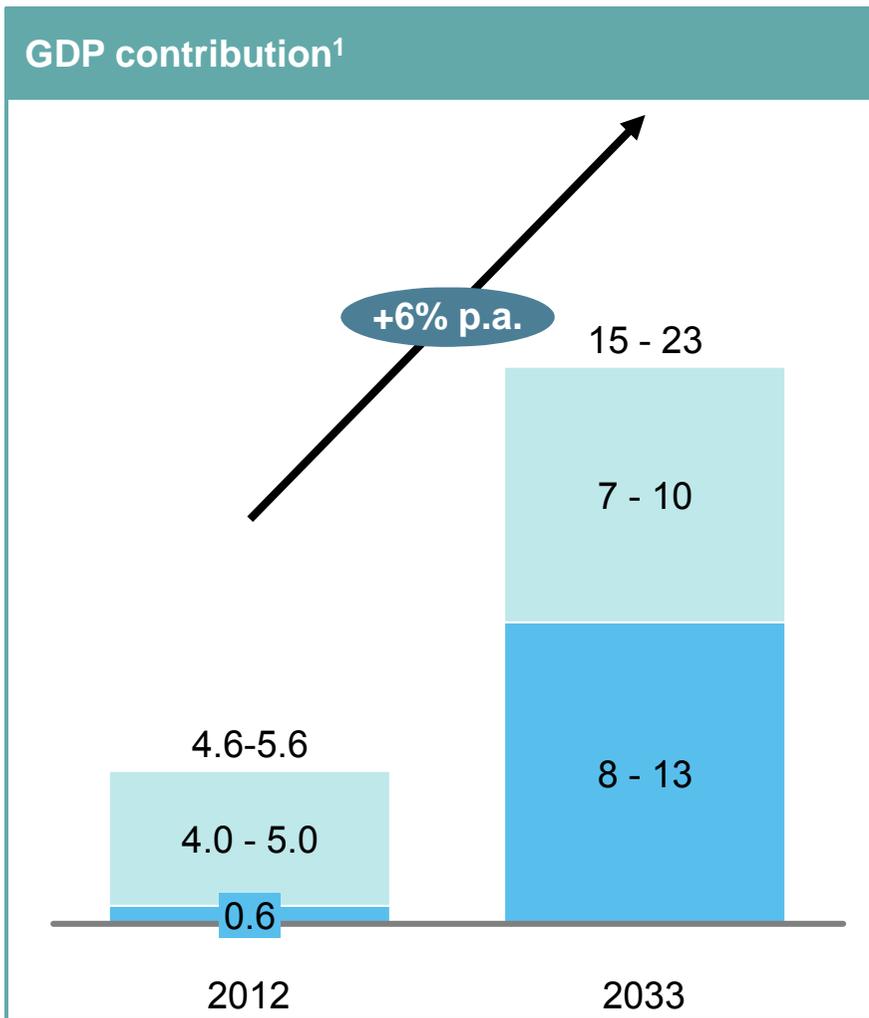


## Egypt trained subsistence farmers and new entrants to succeed while creating an enabling environment for aquaculture sector growth



# In 2013 aquaculture was identified as a priority sector in the development of South Africa's ocean economy

Fisheries Aquaculture



1 Only direct potential (excluding multiplier effect) from the EEZ considered

2 Growth rate per annum (p.a.) is based on the 2033 projected base value; based on 2033 catch/jobs ratios: abalone – 1 MT/job, mussel – 11 MT/job, oyster – 2 MT/job, marine finfish – 0.3 MT/job, all freshwater species – 0.3 MT/job (obtained from expert interviews)

SOURCE: Stats SA; IHS Global Insight; expert interviews; TNPA port development plan 2011/2012; Transnet corporate plan 2013/2014; NMMU estimates, AME; McCloskey; Platts; press search

## Potential for the aquaculture sector in South Africa

DAFF has identified aquaculture as a sector that presents a good opportunity to diversify fish production



Satisfy local demand



Contribute to food and nutritional security



Create sustainable job opportunities



Foster economic development



Capitalise on export opportunities



Stimulate rural development and livelihoods



Attract foreign direct investment

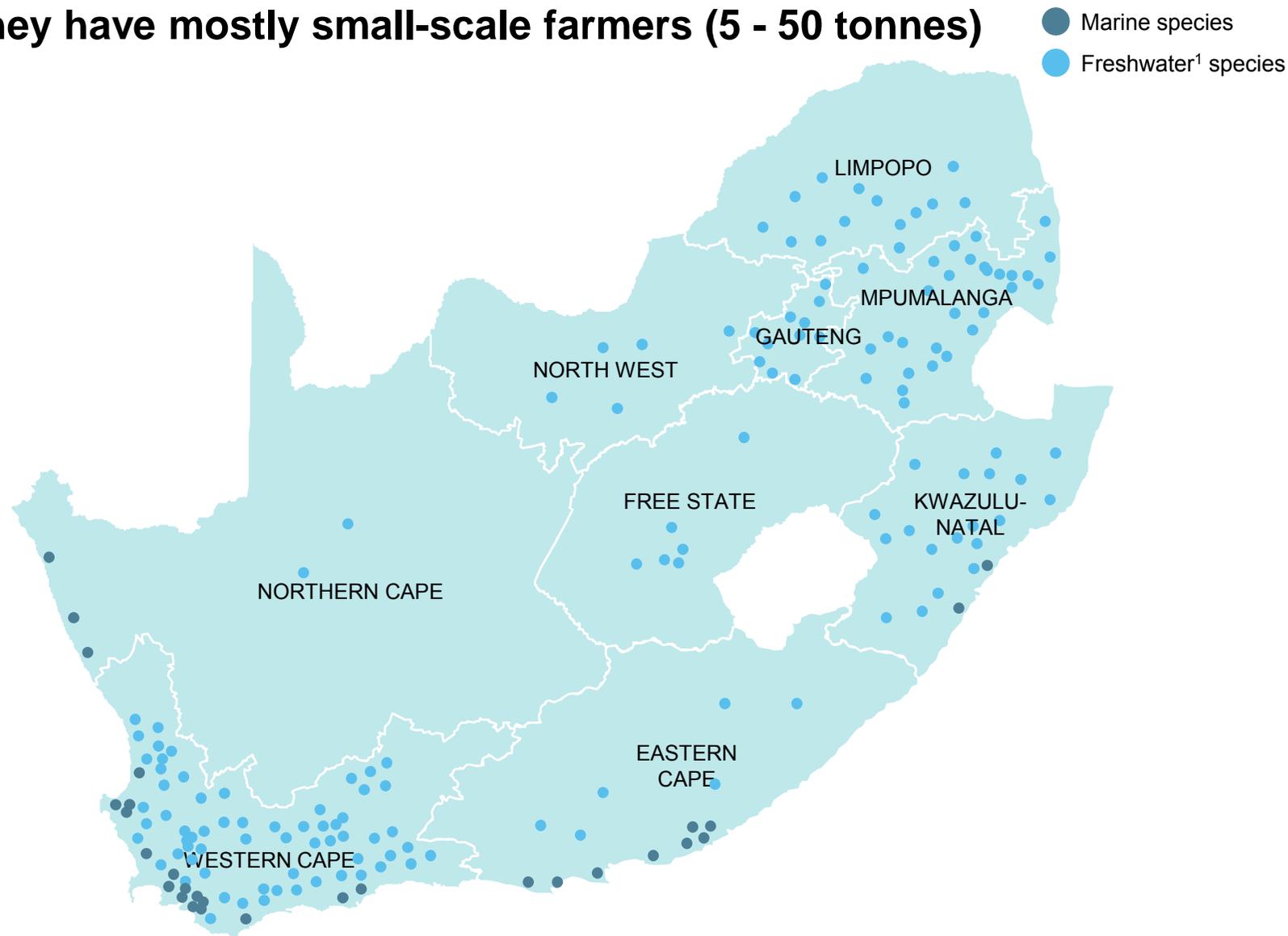


Safeguard sustainable environmental integrity



Create SMMEs and wealth-generating opportunities through aquaculture

**Although there are over 195 operating marine and freshwater aquaculture farms, they have mostly small-scale farmers (5 - 50 tonnes)**



1 Freshwater data is from 2010

SOURCE: DAFF

## Although there is a great deal of diversity, South African marine and freshwater aquaculture are dominated by 6 species

| Marine aquaculture is dominated by molluscs   |   |                                | Freshwater aquaculture is focussed on finfish   |   |                                |
|---|---|--------------------------------|---|---|--------------------------------|
| Species   | Overview  | Production Tonnes <sup>1</sup> | Species   | Overview  | Production Tonnes <sup>1</sup> |
|  <b>Abalone</b>          | <ul style="list-style-type: none"> <li>Farmed exclusively in WC</li> <li>Mostly exported</li> <li>Market price: ZAR 280 - 360/kg</li> <li>0.9 - 1 job is created per tonne of production</li> <li>Maturity: 36 - 48 months</li> </ul> | 1,111                          |  <b>Trout</b>    | <ul style="list-style-type: none"> <li>Maturity                             <ul style="list-style-type: none"> <li>Table trout: 12 months</li> <li>Large salmon trout: 18 months</li> </ul> </li> </ul> | 1,428                          |
|  <b>Oysters</b>          | <ul style="list-style-type: none"> <li>Farmed exclusively in WC</li> <li>Prices: ZAR 45 - 60/kg</li> <li>Imports are cheaper; not required to meet same sanitation standards</li> <li>Maturity: 6 - 12 months</li> </ul>              | 241                            |  <b>Catfish</b>  | <ul style="list-style-type: none"> <li>Forms: live, whole on ice, smoked fillet, pâté</li> <li>Prices: ZAR 30/kg</li> <li>Maturity: 6 - 9 months</li> </ul>   | 160 (2011)<br>0 (2012)         |
|  <b>Mussels</b>         | <ul style="list-style-type: none"> <li>Mediterranean and black mussels</li> <li>Direct price: ZAR 5.50/kg processing (?) +ZAR 18/kg fresh</li> <li>Processed price: ZAR 25/kg</li> <li>Maturity: 7 months</li> </ul>                  | 860                            |  <b>Tilapia</b> | <ul style="list-style-type: none"> <li>Is referred to as aquatic chicken</li> <li>Maturity: 9 months</li> <li>Mozambique tilapia is endemic in South Africa</li> </ul>                                  | 234                            |
|  <b>Marine finfish</b> | <ul style="list-style-type: none"> <li>Dusky kob, silver kob, yellowtail, white margined sole</li> <li>Production prices: ZAR 35-45/kg</li> <li>Maturity: 8 - 12 months</li> </ul>  | 280                            |   |   |                                |

<sup>1</sup> Approved figures from the 2012 Aquaculture Yearbook; 2013 draft awaiting approval

## 4 main marine aquaculture species are cultivated in South Africa (1/2)

|  |  |  |
|--|--|--|
| <p><b>Abalone: key characteristics</b></p>  <ul style="list-style-type: none"> <li>▪ Perlemoen abalone (<i>Haliotis midae</i>)</li> <li>▪ Premium species</li> <li>▪ Optimal temperature: 12 - 20° C</li> <li>▪ Maturity: 36 - 48 months</li> <li>▪ Market price: ZAR 280-360/kg</li> <li>▪ 0.9 - 1 job is created per tonne of production</li> <li>▪ Export forms: live, canned, frozen, dried</li> </ul>  | <p><b>Current abalone production (2012): 1,111 tonnes</b></p>  |  |
| <p><b>Oysters: key characteristics</b></p>  <ul style="list-style-type: none"> <li>▪ Temperature: 18 -24° C</li> <li>▪ Maturity: 6 - 12 months</li> <li>▪ Prices: ZAR R45 – 60/kg</li> <li>▪ Forms             <ul style="list-style-type: none"> <li>– Live, half shelled, shucked</li> <li>– Also smoked/ canned, but not currently done in South Africa</li> </ul> </li> <li>▪ Pacific oyster</li> <li>▪ Can be grown in 10 - 35% salinity water (optimal: 20 - 25%)</li> </ul> | <p><b>Current oyster production (2012): 241 tonnes</b></p>   |  |
| <p><b>Key production challenges</b></p> <ul style="list-style-type: none"> <li>▪ High start-up cost</li> <li>▪ High electricity cost</li> <li>▪ Suitable coastal sites are limited             <ul style="list-style-type: none"> <li>– Competing residential use</li> <li>– High sensitivity to water temperature</li> <li>– Land-based facilities should not be too high above water level; constant flow of water required</li> </ul> </li> </ul>   | <p><b>Other issues</b></p> <ul style="list-style-type: none"> <li>▪ Competition with international sales from lower-cost countries with higher yields and lower costs</li> <li>▪ High energy and veterinary health costs, e.g., 26 farm closure notices sent to shellfish farms in 2011</li> <li>▪ No quality standard defined for dried abalone – could affect South African brand</li> </ul> |  |
| <p><b>Key production challenges</b></p> <ul style="list-style-type: none"> <li>▪ Regular environmental/toxicity testing is required; estimated to be ~ 15% of total production cost</li> <li>▪ Water quality issues from municipal sewage spills</li> <li>▪ Water lease areas not advertised</li> <li>▪ Land-based factory space not being made available</li> </ul>   | <p><b>Other issues</b></p> <ul style="list-style-type: none"> <li>▪ Large number of farm closures (26 in 2011) due to sanitation requirements</li> <li>▪ Imports are cheaper; not required to meet same sanitation standards</li> <li>▪ High dependency on Chile/ France for seed imports</li> <li>▪ Low capitalisation on value-added product market</li> </ul>                               |  |

## 4 main marine aquaculture species are cultivated in South Africa (2/2)

### Mussels: key characteristics



- Spanish and black mussels
- Direct price: ZAR 5.50/kg processing (?) + ZAR 18/kg fresh
- Processed price: ZAR 25/kg
- Maturity: 7 months
- Optimal temperature: 10 - 20° C
- Forms: live, half shelled, shelled, canned/bottled (not produced in South Africa), crumbed/sauced (not produced in South Africa)

### Current mussel production (2012): 860 tonnes

#### Key production challenges

- Spanish mussels (non-indigenous, introduced through ship hull fouling)
- Regular environmental/toxicity testing is required; estimated to be ~ 15% of total production cost

#### Other issues

- A number of farm closures due to sanitation requirements (red tide events)
- Low capitalisation of profit margin gains from vertically integrating processing

### Marine finfish: Key characteristics



- Dusky kob, silver kob, yellowtail, white margined sole
- Maturity: 8 - 12 months
- Production prices: ZAR 35 - 45/kg
- Optimal temperature: 20 - 25° C
- Forms: whole, filleted, cold/hot smoked, added herbs/sauce, breaded

### Current marine finfish production (2012): 280 tonnes

#### Key production challenges

- Dusky kobs are migratory species
- High mortality rate for kob, e.g., only 3 out of 10,000 juvenile kob reach 1 kg in size
- Expensive land-based water recirculation systems are required for some species
- Highly technology-driven sector with high start-up costs as a result

#### Other issues

- Complex environmental legislation
- No processing capacity has been planned for any projects/farms under development
- No certification programmes are in progress/planned to be developed
- Complex hatchery requirements; might lead to dependency on imports
- Many substitutes exist in the market

## 2 main freshwater aquaculture species are cultivated in South Africa

**Trout: key characteristics**



- Temperature: optimal 16° C; range 6 - 16° C
- Production cycle
  - Table trout (300 g avg. @ 12 months – 450 MT @ ZAR 65/kg)
  - Large salmon trout (1.5 kg avg. @ 18 months – 1,500 MT @ ZAR 75/kg)

**Market**

- Current national production 2,000 MT
- Further 3,500 MT imported

**Current trout production (2012): 1,428 tonnes**

**Key production challenges**

- Active role by lead agency for interdepartmental enabling of environment provision required
- Current restrictive legislation
- Access to public water bodies
- Applied research
- Extension facilities

**Other issues**

- Access to risk capital for financing new ventures involving BBEEE
- Facilitation for formation of PPP
- One-stop regulatory approval
- Western Cape Aquaculture Development Initiative – extended to include other provinces

**Catfish: key characteristics**



- Produced at extremely high densities of up to 500 kg/m<sup>3</sup> in recirculating systems
- Temperature: 26 - 28° C in recirculating systems, 18 - 24° C in open ponds
- Maturity: 6 - 9 months
- Price: ZAR 30/kg
- Forms: live, whole on ice, smoked fillet, pâté

**Current catfish (2012): 160 tonnes**

**Key production challenges**

- Local fish grow slowly and feed conversion ratio is poor
- Recirculating technology is costly
- Expensive feed makes COP too high to be competitive
- Negative perceptions about catfish make marketing difficult
- Inland processing not available for fish

**Other issues**

- No quality standard defined for products
- Recirculating systems require constant electricity supply
- Veterinary services not available
- Poor track record of catfish farming makes access to finance difficult
- Only 1 commercial system that can assist with practical training

*\*Please note that details for tilapia have not been added into the report*

## Operation Phakisa – aquaculture lab aspiration

### HEADLINES 2019: South African economy reaps the rewards of Operation Phakisa

"... to aquaculture in South Africa has shown strong growth in 5 years, with **production from 2014 up 5 fold to 20,000 tonnes ...**"

"... The aquaculture sector in South Africa now **employs 15,000 people in direct and full-time jobs ...**"

"Jobs in aquaculture sector seen as **quality jobs, improving livelihoods in rural communities ...**"

"... experts estimate the **revenue contributed by aquaculture to South Africa's economy to be as much as ZAR 3 billion ...**"

"... exciting momentum built in Operation Phakisa evidenced by **aquaculture's inclusive growth ...**"



**Abalone**



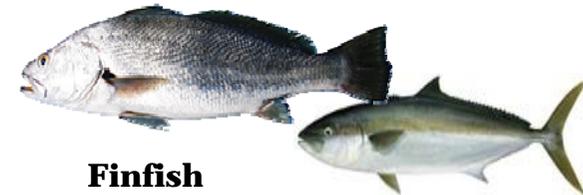
**Oysters**



**Mussels**



**Finfish**



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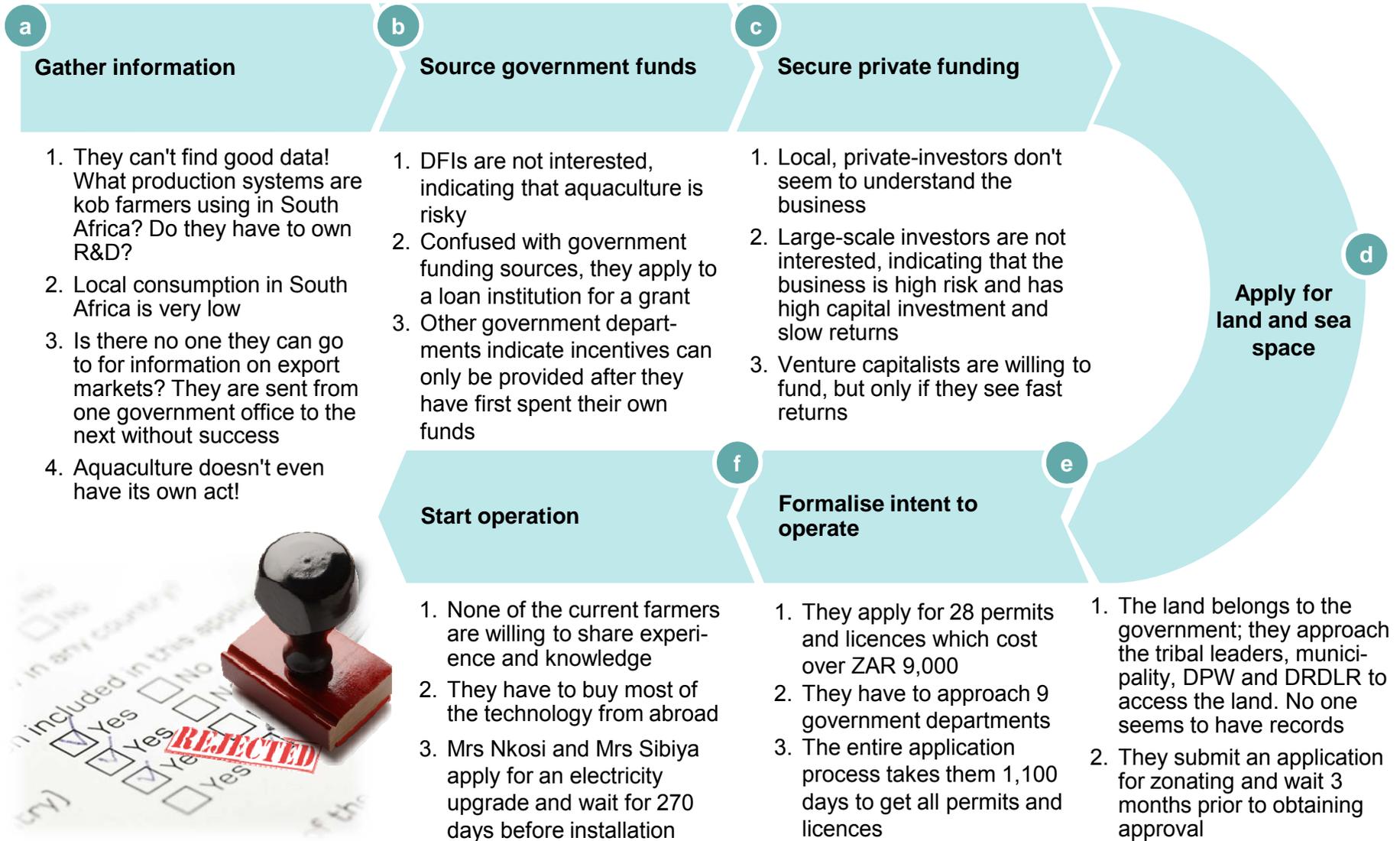
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## Scenario: current challenges in setting up an aquaculture farm

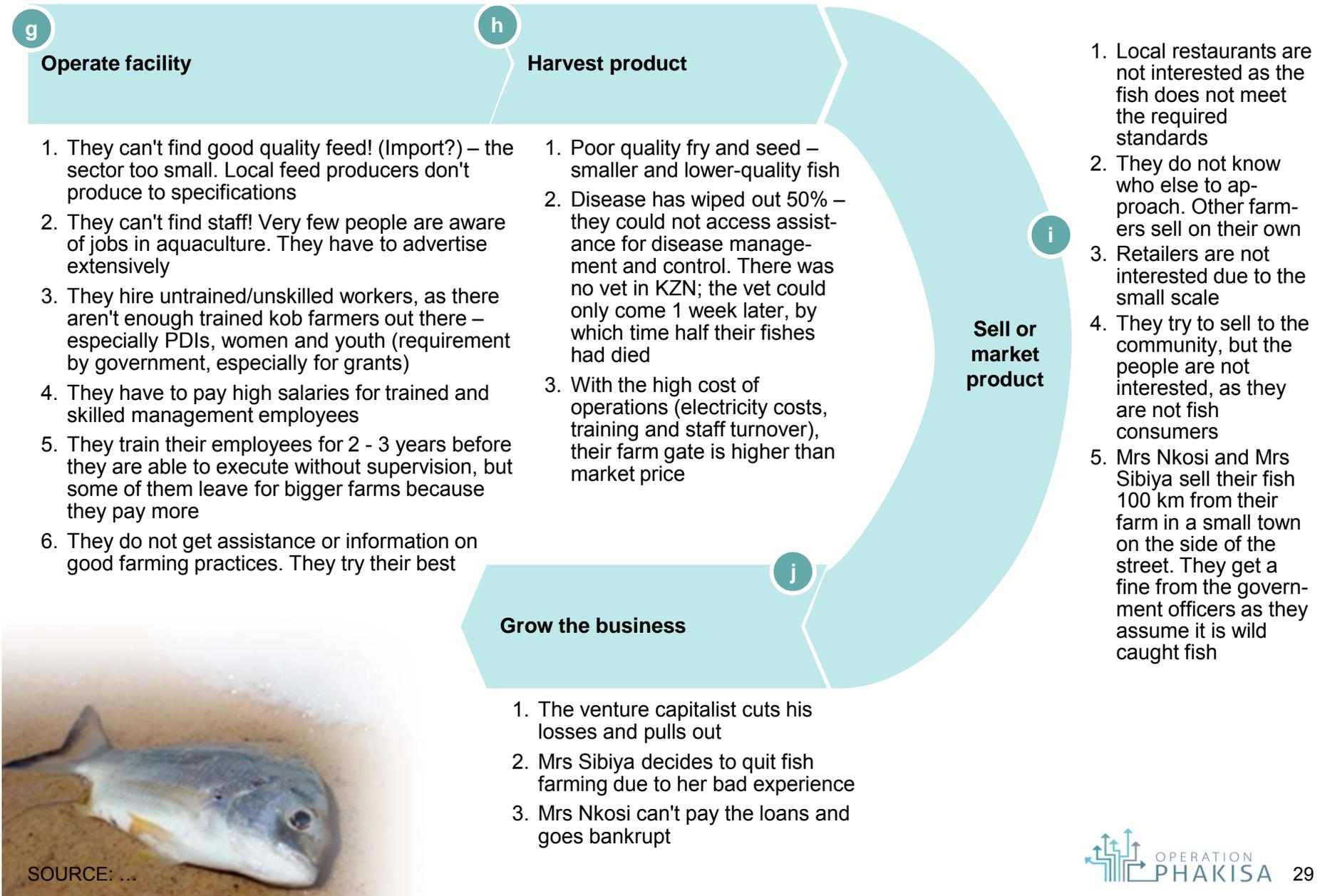
Mrs Nkosi and Mrs Sibiya grew up fishing in the Tugela River. Due to the depleted fish stocks, they can't access affordable fish and would like to start a kob farm in KwaZulu Natal



SOURCE: ...

# Scenario: current challenges to operating an aquaculture farm

Mrs Nkosi and Mrs Sibiya met all their infrastructural and legal requirements managed to grow their fish and are trying to access the market



## Approach taken by the lab to identify and address key challenges

Issues can be categorised based on the approach required for resolution

### 1 Scale and project-specific issues

- Issues that are linked to the size of the sector due to low production volumes, leading to high costs of production and challenges in value chain development (quantity)
- Issues that relate specifically to an operation, i.e., issues that are unique by farm, business and/or species. These issues require a specific, project-based approach for resolution (quality)

### 2 Enabler issues

- Issues that relate to the ability of businesses to operate within the sector. These are cross-cutting issues, which impact the sector as a whole and require a common approach

## The aquaculture sector in South Africa has incredible potential and, yet, remains at a small scale, leading to many challenges for producers

1

### 4 project-related issues that contribute to or result from the sub-scale nature of the sector in South Africa



#### Insufficient primary infrastructure in rural areas

Aquaculture in rural areas is challenged by infrastructural limitations



#### R&D is fragmented

The R&D activities are not co-ordinated and do not align with the industries' needs



#### Lack of access to quality inputs

Quality seed, fingerlings and feed are critical to the health and quality of the products. Due to the limited scale, there is a limited number of input suppliers for the sector, which also increases the cost of production



#### Lack of inclusivity

Limited participation by youth, women and black people in the sector. Currently, the sector averages less than 10% PDI participation at management levels

## In addition, there are 4 supply-side and demand-side issues that hinder the growth of the sector

2

**4 enabler issues** that relate to the ability of the projects to operate. These are cross-cutting issues that impact the sector as a whole



### **Unsupportive legislative and regulatory environment**

The current regulation and governance systems do not cater to the aquaculture sector specifically. In addition, delivery systems are slow and costly. Compliance burden serves as a barrier to the sector

### **Limited access to land and sea space**

The aquaculture sector is often excluded from spatial planning. In a user conflict situation, aquaculture does not often get priority



### **Access to finance**

The aquaculture sector faces difficulty in accessing finance as it is not well understood by financial institutions and deemed to be a high-risk sector. The sector requires high capital investment and a long payback period



### **Small pool of skills and knowledge**

Due to the emerging nature of the sector, there is limited extension support (specialised state extension officers, veterinarians and researchers). There is also little awareness of aquaculture farming as a career and education option



### **Limited accessibility of markets**

This is due to undeveloped value chains. In addition, limited market intelligence has led to fragmented marketing efforts. Hence, production and project planning are not based on demand

# Contents

## Executive summary

- 1.1 Quick glance
- 1.2 Overview of the aquaculture sector
- 1.3 Overview of issues
- 1.4 Overview of initiatives**



## Approach taken by the lab to develop solutions for identified issues

Solutions for issues were developed that supported the following key objectives

**1** 4 project-related issues that contribute to or result from the sub-scale nature of the sector in South Africa

**Solution:** Select and fast-track implementation of projects that will increase the scale of the sector. In addition, establish mechanisms to address project-specific issues as part of the project implementation

**2** 4 key enablers were identified as blockages to the sector's growth

**Solution:** Beyond the project-specific mechanisms established, there are cross-cutting issues that will be addressed by sector-wide initiatives. The enablers are critical to the success and sustainability of projects implemented

### Economies of scale

#### Project quantity and quality



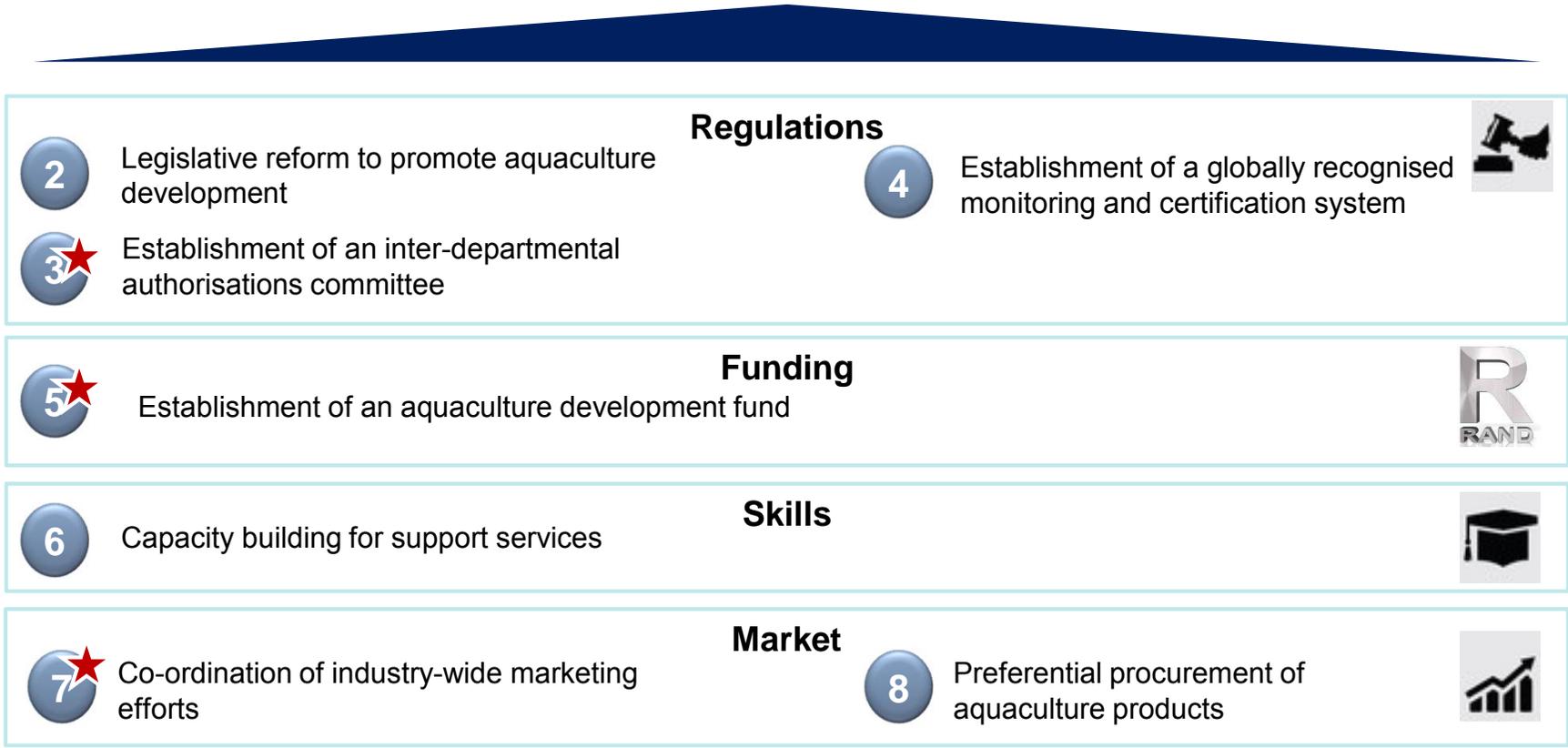
#### Enablers



# Solutions developed focus on priority initiatives that support the implementation of the projects

**1** ★ Selection and implementation of 24 projects

- Phased implementation of selected projects
- Resolution of project-specific issues within the project implementation plans



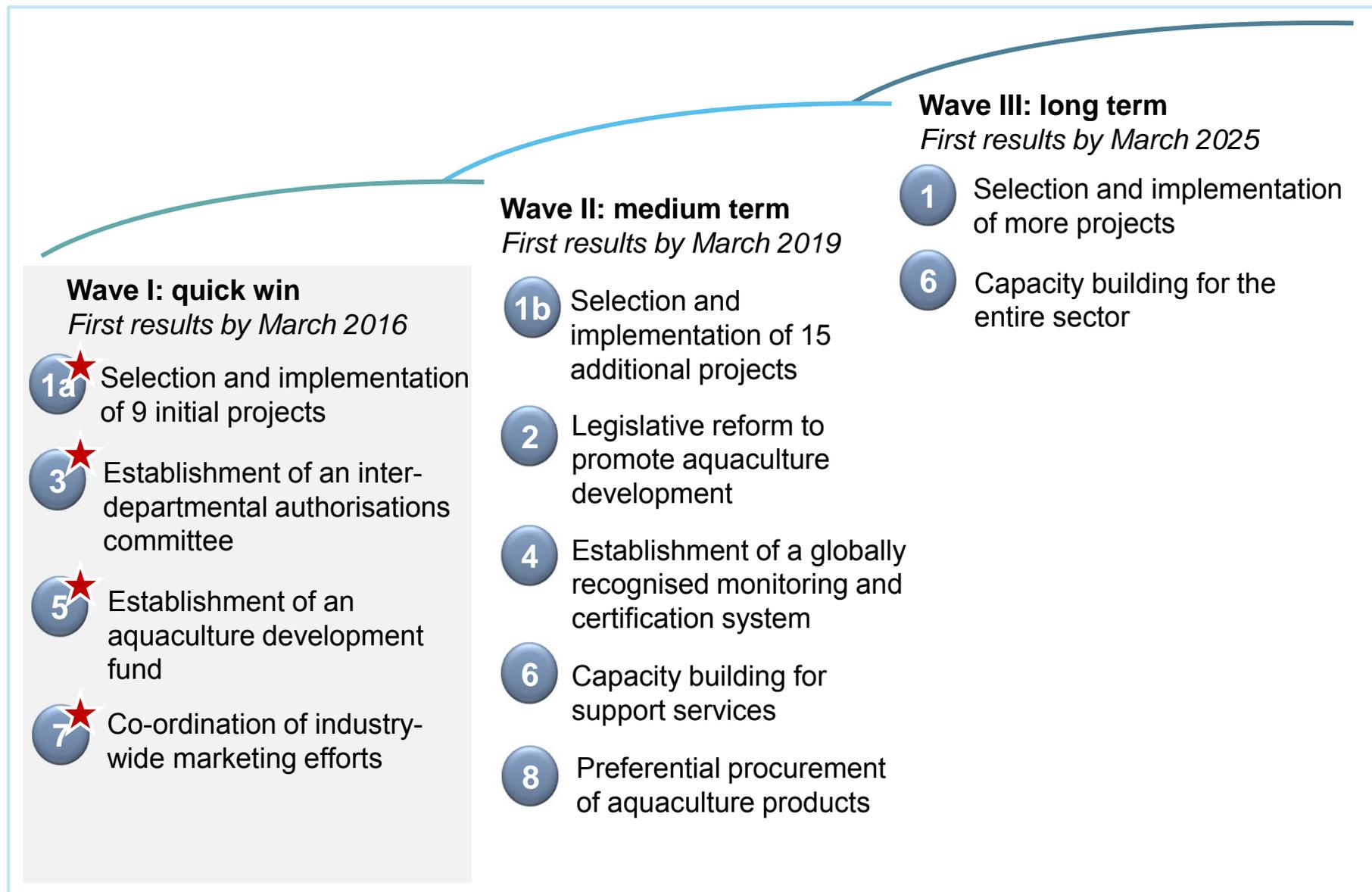
# Scenario: with the implementation of Operation Phakisa initiatives, Mrs Nkosi and Mrs Sibiya will be able to expand their farm

No. Related initiatives



## Specific initiatives have been identified as quick wins

★ Quick wins



## Initiatives have been ranked by priority, and budget requirements have been specified

■ Detailed in following pages

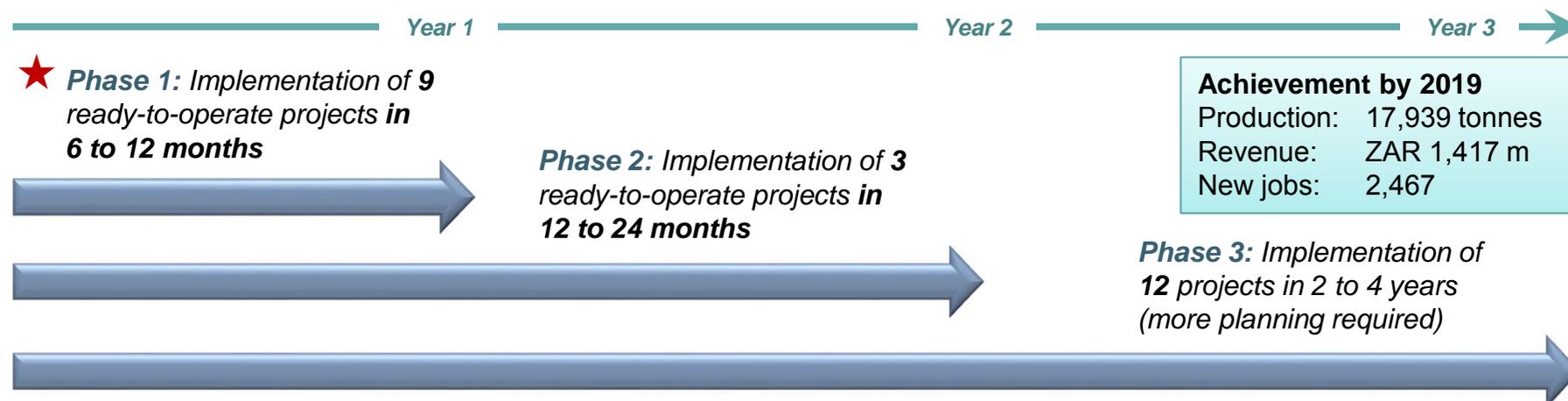
★ Quick wins

| Highest priority |  | <u>Budget required ZAR m</u> |
|------------------|--|------------------------------|
|                  | 1★ Selection and implementation of 24 projects                               | 1★ 2,383                     |
|                  | 3★ Establishment of an inter-departmental authorisations committee           | 3★ 2                         |
|                  | 5★ Establishment of an aquaculture development fund                          | 5★ 6                         |
|                  | 7★ Co-ordination of industry-wide marketing efforts                          | 7★ 55                        |
|                  | 2 Legislative reform to promote aquaculture development                      | 2 9                          |
|                  | 4 Establishment of a globally recognised monitoring and certification system | 4 27                         |
|                  | 6 Capacity building for support services                                     | 6 n/a                        |
|                  | 8 Preferential procurement of aquaculture products                           | 8 7                          |

# 1 Implementation of Phase 1 projects

The challenges presented by the production scale of the sector will be addressed by the expedited implementation of aquaculture projects, which will serve as a catalyst to the growth of the sector

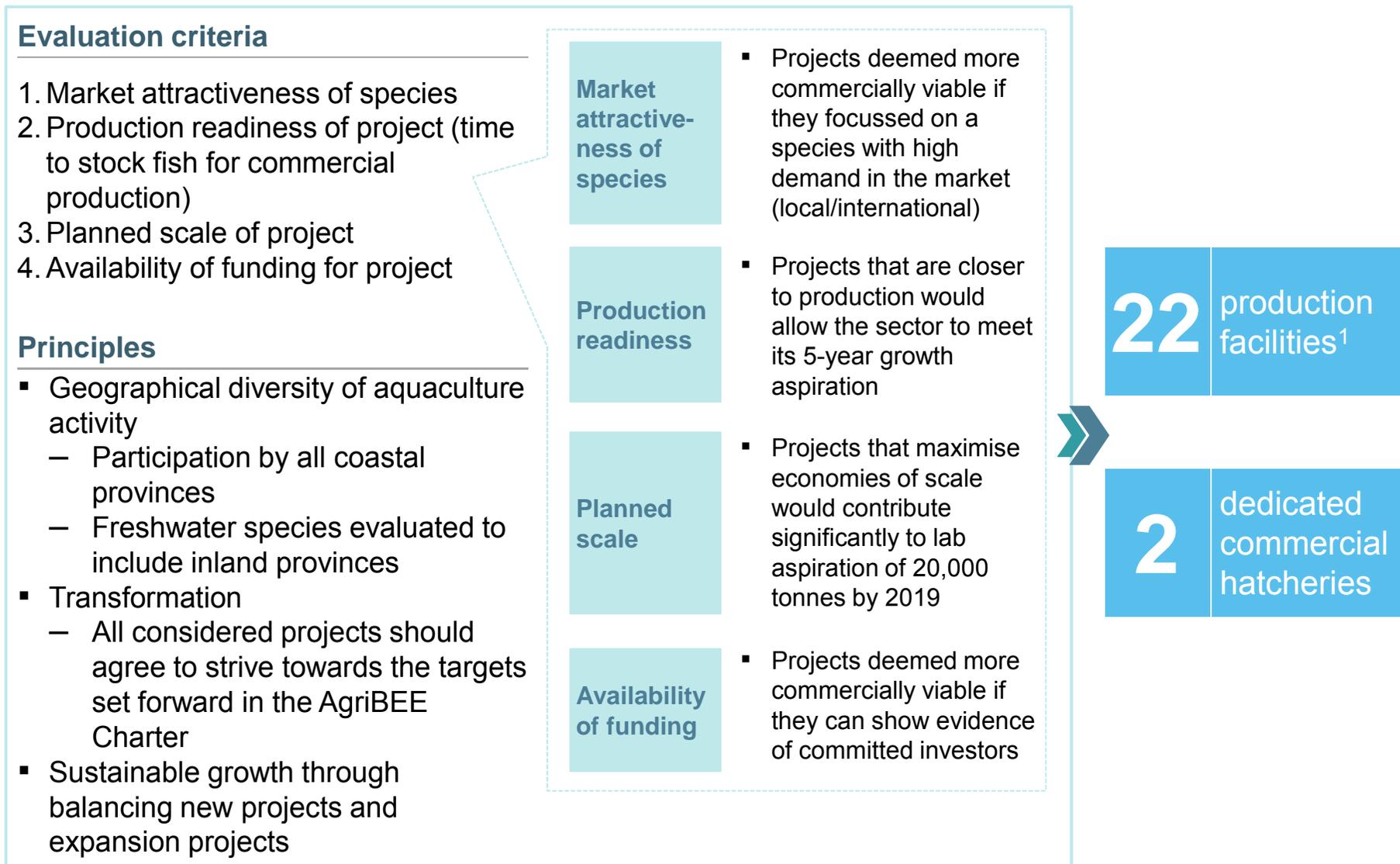
24 aquaculture projects were selected based on criteria developed in the lab. These projects were categorised into 3 phases based on their readiness to begin implementation and operate, as follows



| New jobs       | 424    |       | 580    |       | 572    |       | 548    |       | 343          |            |
|----------------|--------|-------|--------|-------|--------|-------|--------|-------|--------------|------------|
|                | 2015   |       | 16     |       | 17     |       | 18     |       | 2019         |            |
|                | Tonnes | ZAR m | Tonnes       | ZAR m      |
| <b>Phase 1</b> | 951    | 247   | 1,359  | 306   | 1,988  | 389   | 3,385  | 500   | <b>4,117</b> | <b>552</b> |
| <b>Phase 2</b> | 500    | 27    | 1,000  | 62    | 2,130  | 117   | 3,622  | 208   | <b>3,922</b> | <b>229</b> |
| <b>Phase 3</b> | 950    | 42    | 1,930  | 99    | 4,400  | 267   | 7,450  | 499   | <b>9,900</b> | <b>637</b> |

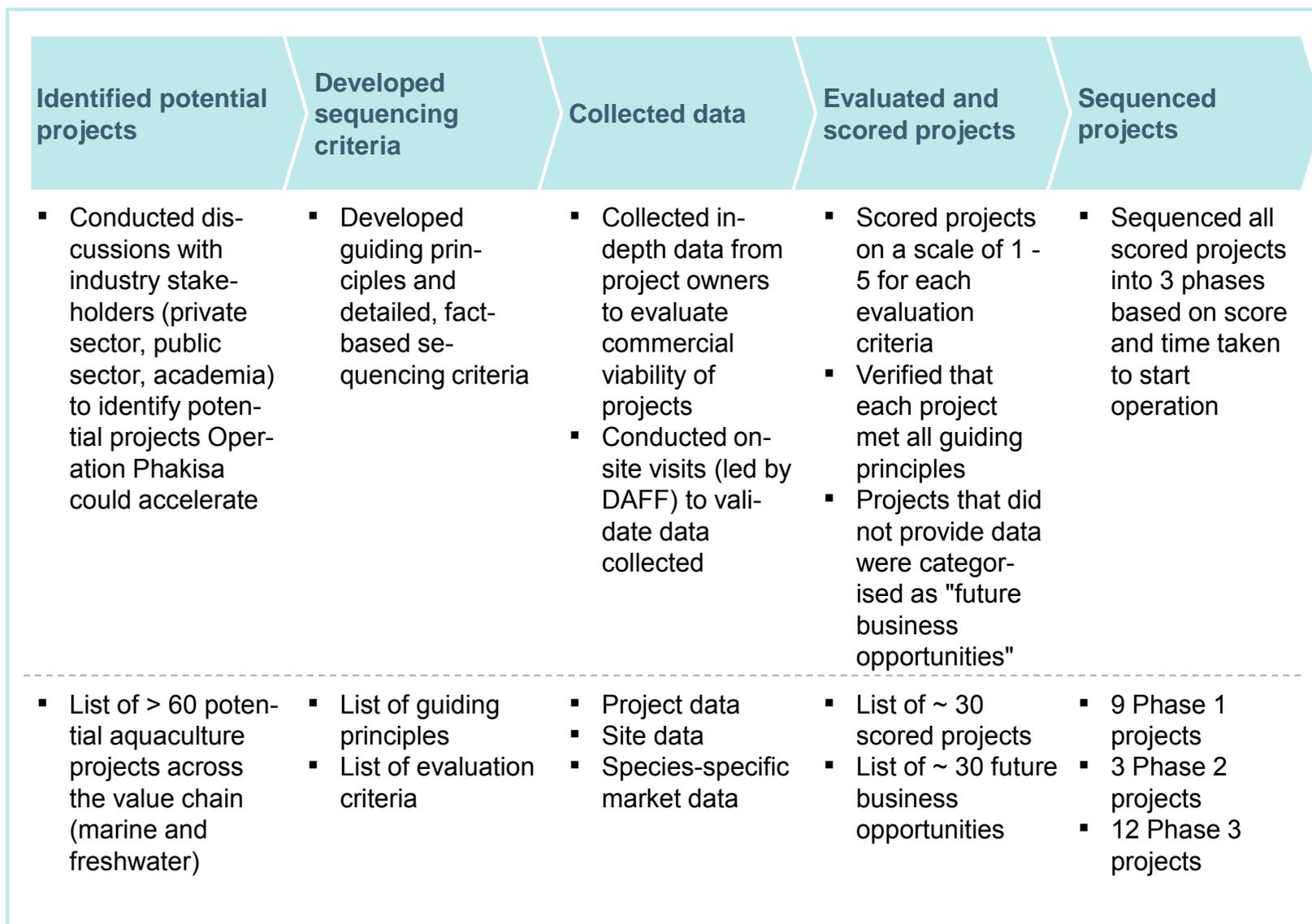
SOURCE: ...

# 1 The approach to project selection was guided by 3 principles and 4 evaluation criteria



1 Some production facilities include processing plants

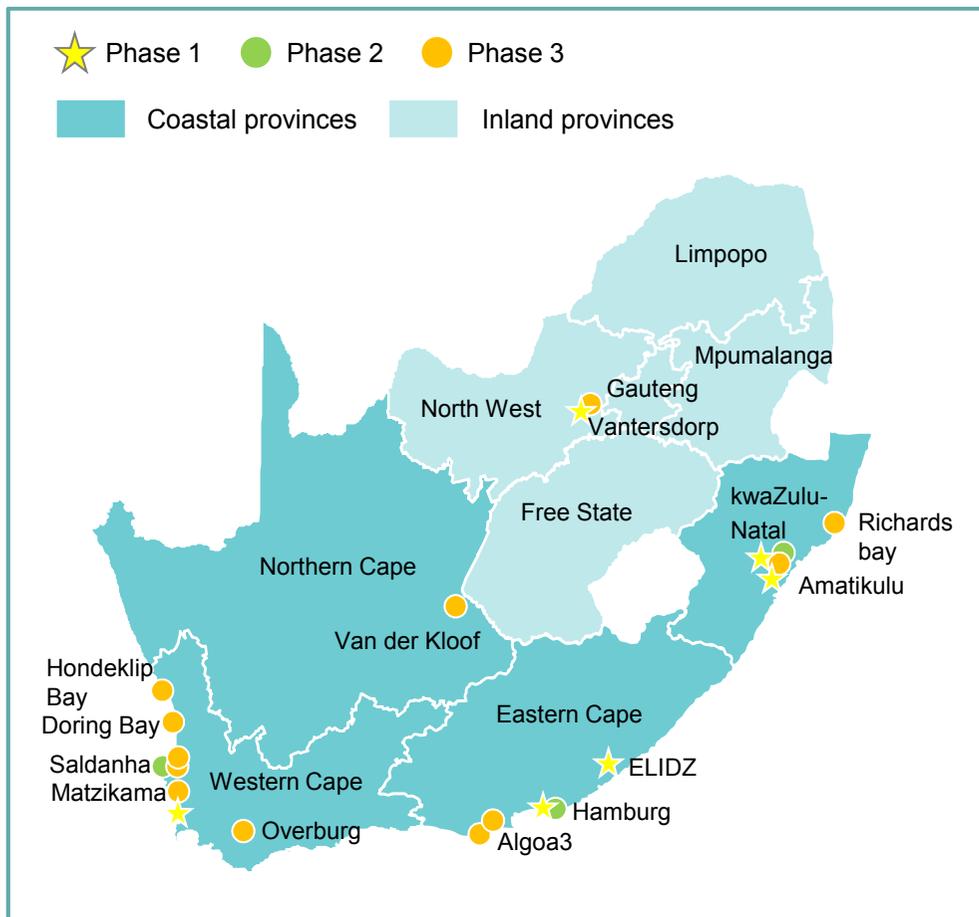
# 1 The lab devised an objective, fact-based approach to identify high-impact projects



# 1 Evaluation criteria: collaboratively developed considering key success factors for high-impact projects

|   | <b>Rationale</b>  | <b>Measurement proxy</b>  | <b>Weighting</b> |
|---|---|---|------------------|
| <b>Market attractiveness of species</b> | <ul style="list-style-type: none"> <li>Projects deemed more commercially viable if they focussed on a species with high demand in the market (local/international)</li> </ul> | <ul style="list-style-type: none"> <li>A composite score that considered               <ul style="list-style-type: none"> <li>Presence of existing local, regional and international clients</li> <li>Level of demand in market</li> <li>Product diversity and potential value added</li> <li>Level of private-sector investment</li> </ul> </li> </ul> | 30%              |
| <b>Production readiness</b>             | <ul style="list-style-type: none"> <li>Projects that are closer to production would allow the sector to meet its 5-year growth aspiration</li> </ul>                          | <ul style="list-style-type: none"> <li>Time to stock for maximum commercial capacity</li> </ul>   | 30%              |
| <b>Planned scale</b>                    | <ul style="list-style-type: none"> <li>Projects that maximise economies of scale would contribute significantly to lab aspiration of 20,000 tonnes by 2019</li> </ul>         | <ul style="list-style-type: none"> <li>Scale multiple (planned additional tonnage divided by minimum tonnage for commercially viable production)</li> </ul>   | 20%              |
| <b>Availability of funding</b>          | <ul style="list-style-type: none"> <li>Projects deemed more commercially viable if they can show evidence of committed investors</li> </ul>                                   | <ul style="list-style-type: none"> <li>Committed financing as a percentage of total investment required for project execution</li> </ul>  | 20%              |

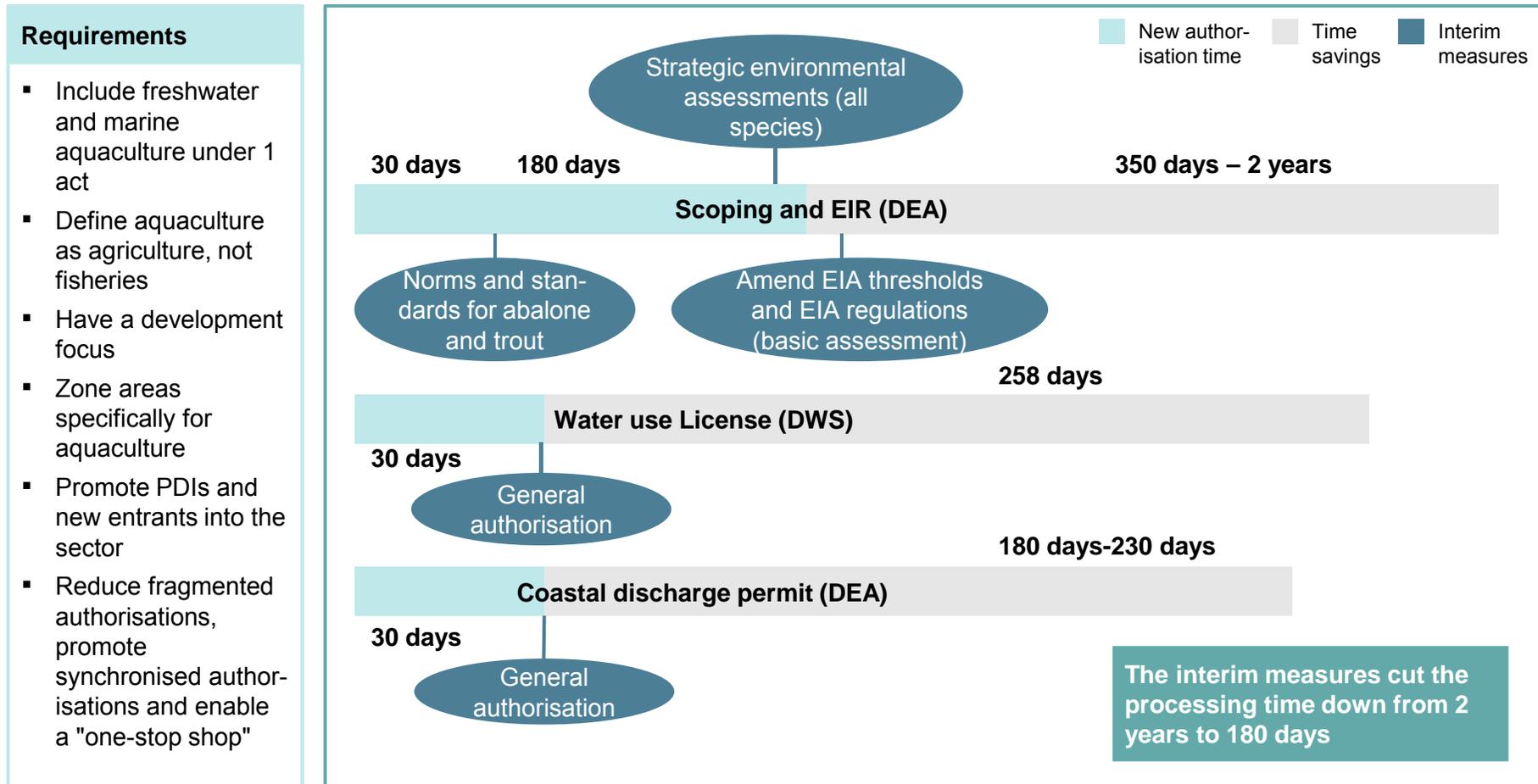
# 1 24 projects have been selected and sequenced for implementation across 3 phases



| Project/enterprise |   |
|--------------------|---|
| ★                  | Hatchery expansion – Paternoster – oysters             |
| ★                  | Expansion – East London IDZ – kob                      |
| ★                  | Expansion – Hamburg cluster – oysters                  |
| ★                  | Expansion – Ventersdorp – catfish                      |
| ★                  | Expansion – Jacobsbaai Sea Products                    |
| ★                  | Expansion – Abagold                                    |
| ★                  | Expansion – HIK Abalone                                |
| ★                  | New – Amatikulu – kob                                  |
| ●                  | Expansion – Amatikulu – ornamentals                    |
| ●                  | Expansion – DST Abalone Hatchery                       |
| ●                  | New – Hamburg cluster – kob                            |
| ●                  | New – Saldanha Viking Cages – trout                    |
| ●                  | ADZ – Ventersdorp – catfish                            |
| ●                  | Doring Bay Abalone                                     |
| ●                  | New – Saldanha Viking Cages – salmon                  |
| ●                  | Expansion – Saldanha Blue Ocean Mussels – mussels    |
| ●                  | Expansion – Saldanha Bay Oyster Company – oysters    |
| ●                  | New – Saldanha Southern Atlantic Sea Cages – salmon  |
| ●                  | New – Algoa Bay Sea Cage Farming – yellowtail        |
| ●                  | New – Richards Bay Sea Cage Farming – dusky kob      |
| ●                  | New – Diamond Coast Abalone Ranching – abalone       |
| ●                  | New – Van der Kloof – trout                          |
| ●                  | New – Matzikama Brenner Dietrichs – abalone          |
| ●                  | New – Buffeljachts - abalone                         |

## 2 Legislative reform to promote aquaculture development

The aquaculture sector requires a specific aquaculture act to govern the sector's activities effectively. This act will require several years to implement, and as such, interim measures have been developed in order to address some of the issues currently faced



## 2 The following legislative amendment requirements were identified

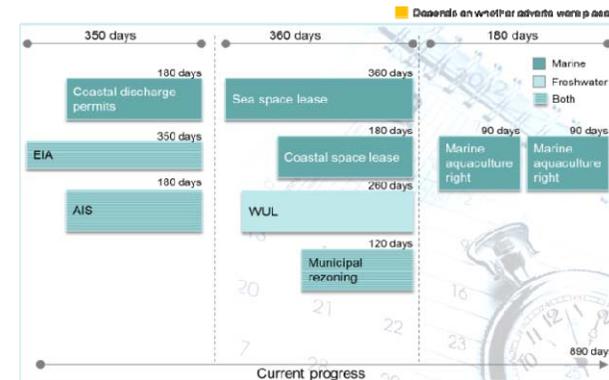
| Amendment  | Impact   |
|--|--|
| Increase minimum and maximum EIA thresholds for aquaculture (NEMA 107 of 1998)   | Small farms would fall under the EIA threshold, and other farms would be restricted to a basic assessment, which is simpler and shorter than a full scoping and EIR  |
| Resolve concerns around additional permitting layer under the Alien and Invasive Species Regulations (NEMBA 10 2004)           | Avoid additional permit layer and specialist study requirements for existing and new farmers   |
| Finalise trout and abalone norms and standards (NEMA 107 of 1998)  | Farms that fall within the scope and adhere to norms and standards would not trigger an EIA and could start in 30 days from notification   |
| Undertake and adopt a strategic environmental assessment for land-based aquaculture  | Zone environmentally less-sensitive and suitable areas for aquaculture, which requires minimal or no additional permits and assessments prior to authorisation   |
| Develop a general authorisation for freshwater water use (Water Act 36 of 1998)  | In line with the norms and standards, avoid the need to apply for the water use licence, which can take 6 months to a couple of years to get, by adhering to general authorisation, which covers the requirements of aquaculture farms (flow rate, water quality etc.) |
| Develop a general authorisation for coastal discharge permits (ICM Act 24 of 2008)   | In line with the norms and standards, avoid the need to apply for the discharge permit, which can take 4 to 8 months to get, by developing general authorisation, which covers the requirements of low-risk aquaculture effluent (flow rate, water quality etc.)       |
| Increase tenure of MLRA rights for marine aquaculture rights holders from 1 year to 2 years and combine permits where possible | Reduce the administration cost for the sector from applying for various permits annually   |
| Adjust DTI Industrial procurement policy framework   | Ensure that locally farmed fish is included in the policy  |
| Develop an aquaculture act   | Foster a one-stop-shop approach, include freshwater aquaculture, promote PDI entrants, have development focus, zone areas for aquaculture ...  |

### 3 Establishment of an inter departmental authorisations committee

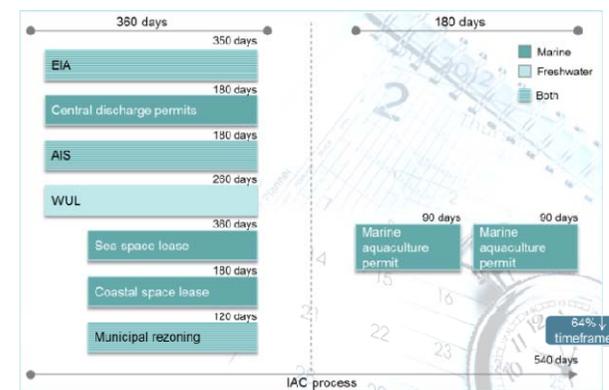
Currently, there is an uncoordinated approach to application processing for aquaculture, approvals, which can take up to **890 days**. The establishment of an inter departmental authorisations committee (IAC) aims to co-ordinate applications and approvals, with the expectation of reducing the processing time to **240 days**



Representation at the IAC by all relevant departments



**890 days to 240 days!**



## 4 Establishment of a globally recognised monitoring and certification system

Importing nations require health assurances that the products they receive are safe for consumption. South Africa needs an internationally recognised health assurance system to grow the markets that can be accessed

**Some programmes are already operating, but are under-resourced**

At present, there is no co-ordinated health assurance system in place. This impacts exports, as producers cannot expand out of existing markets. A dedicated sub-directorate would

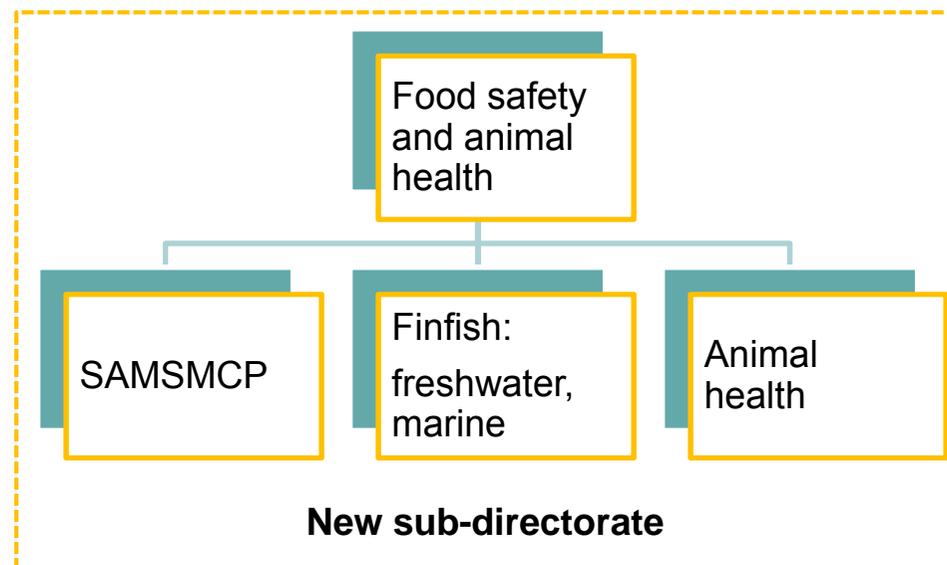
Open new markets

Ensure safe products for export/sale

Reduce bureaucracy

Provide a quick response to new regulations

Help develop aquaculture



**Effective programmes would unlock at least 9 NEW markets for South African aquaculture products!**

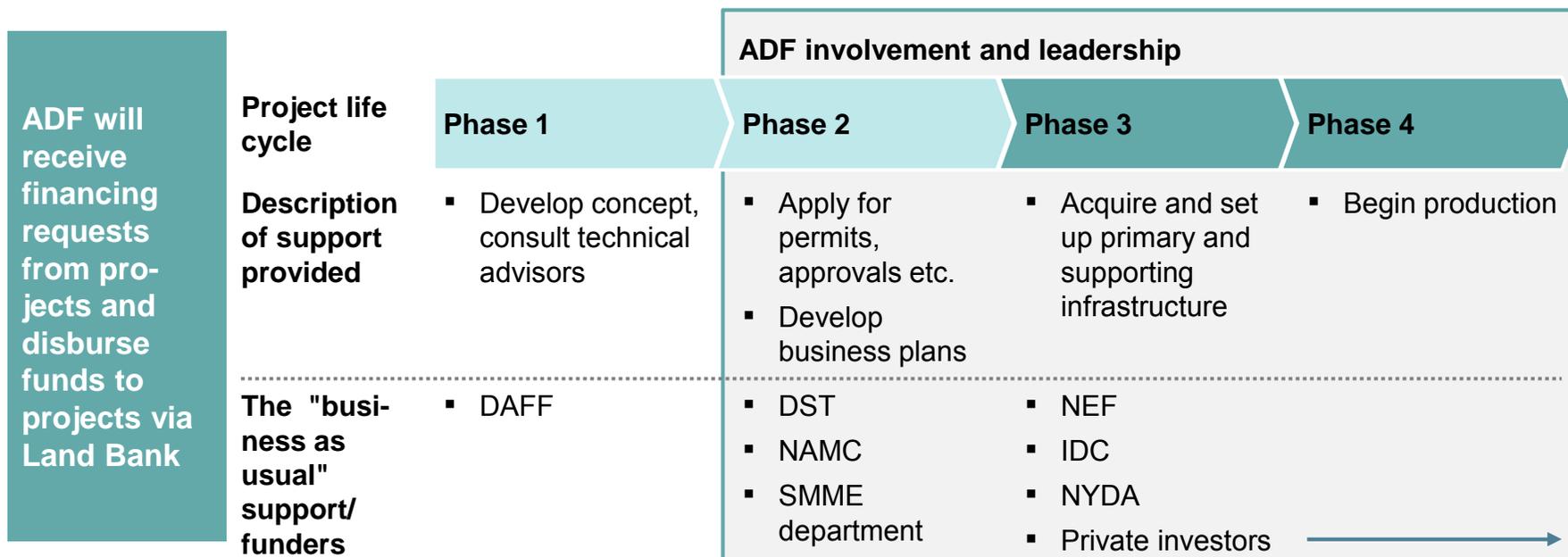
## 5 Establishment of an aquaculture development fund

The aquaculture sector faces difficulty in accessing finance, as the sector is small and not well understood by financing institutions

### ADF aims to fast-track growth while meeting transformation objectives

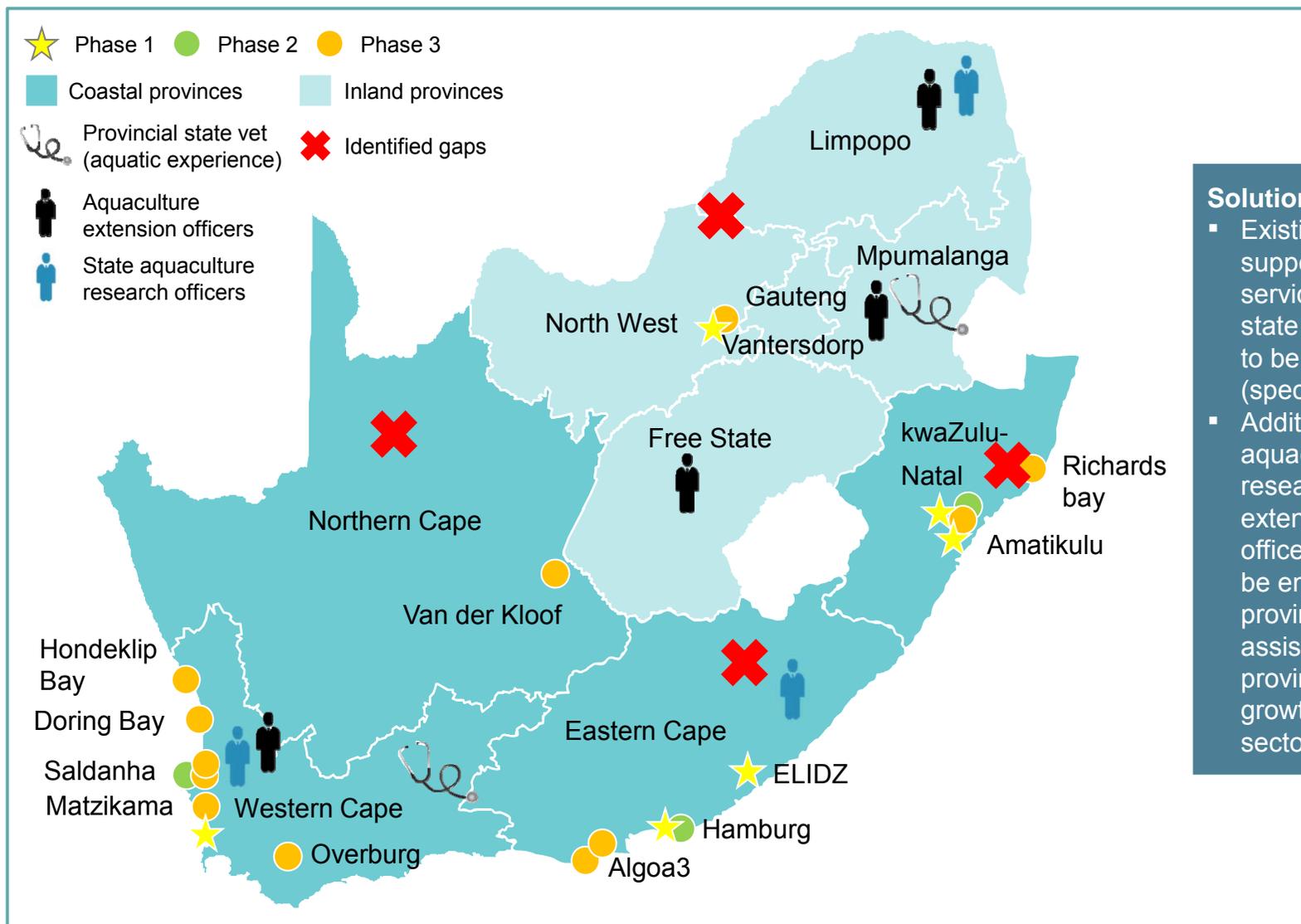
- Funding pool to assist end-to-end aquaculture projects
- Co-ordination of funding from various government departments and DFIs through an MoC
- Initial proposal for ADF to be managed by Land Bank
- Key focus of ADF is to drive transformation/inclusivity by providing new entrants with access to funding in the pre-production phase

-  Funding only required for new projects
-  Where ADF will operate



## 6 Capacity building for support services

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



**Solution**

- Existing state support services, e.g., state vets need to be upskilled (specialised)
- Additional aquaculture research and extension officers need to be employed provincially to assist with provincial growth in the sector

## 7 Co-ordination of industry-wide marketing efforts

The players in the aquaculture sector have limited access to and awareness of markets for aquaculture products due to the silo-based approach towards marketing. In addition, there is little awareness and, hence, local consumption of aquaculture products in South Africa

4 sub-initiatives were developed to address these issues, which will be executed through an industry organisation, Aquaculture South Africa, mandated to co-ordinate industry-wide marketing initiatives

1. Improve and co-ordinate market intelligence initiatives through a centralised system



2. Improve domestic access to markets. Co-ordinated SSAS marketing will open new markets



3. Strengthen emerging producers through increasing value chain ownership and product development through co-owned processing facilities



Evaluate a set of standards retailers suggest as minimum requirements



Negotiate with both retailers and producers to adopt the standards



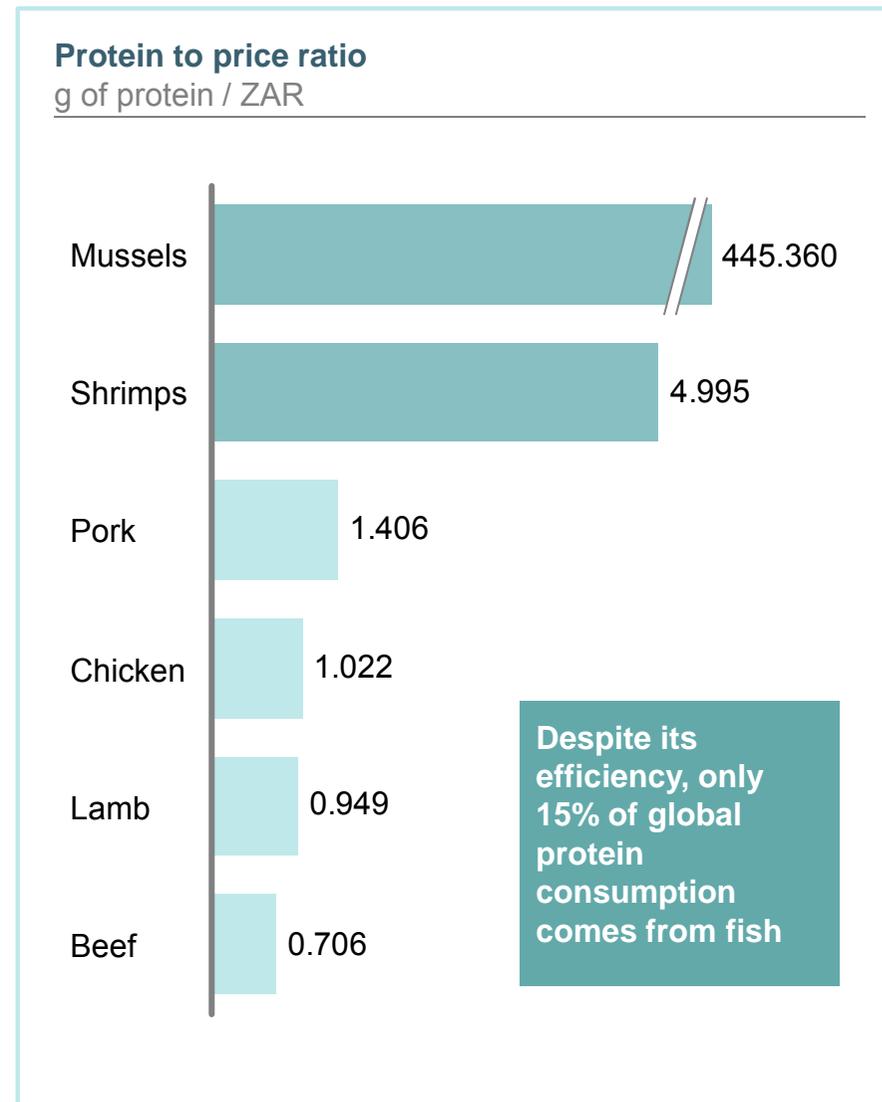
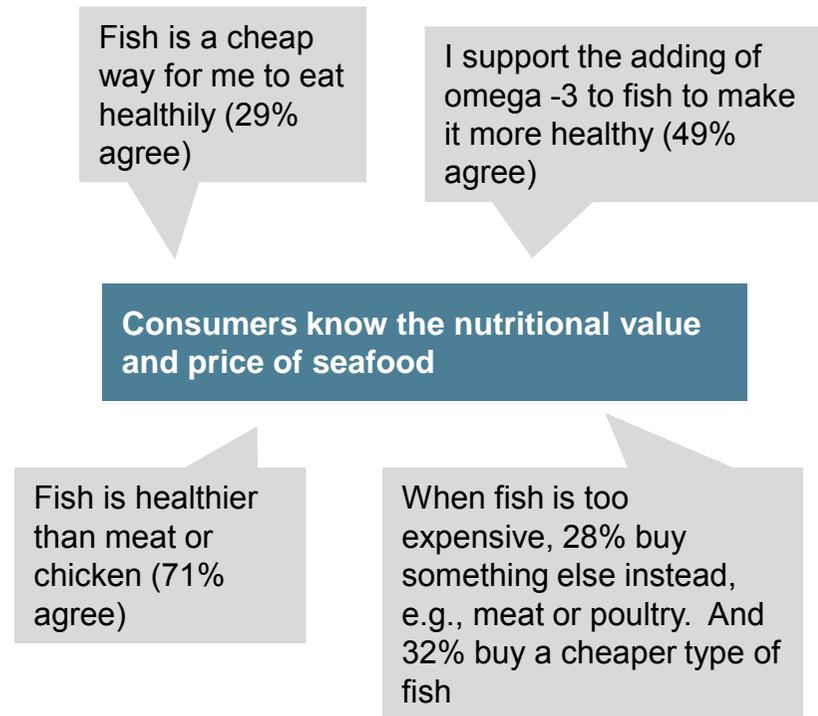
The availability of good quality value-for-money products increases for consumers

4. Promote responsible, fair regulation and environmental certification

## 8 Preferential procurement of aquaculture products

Preferential procurement can create local markets while contributing to transformation and food security in South Africa. This initiative aims to sell aquaculture products to government institutions in order to:

1. Increase sales and stimulate local demand
2. Create market awareness for aquaculture products



## Budget required

### Total budget, ZAR m

| No.          | Initiative   | 2014/15    |                            | 2015/16    |                            | 2016/17 - 2018/19 |                              | Total        |                                |
|--------------|--|------------|----------------------------|------------|----------------------------|-------------------|------------------------------|--------------|--------------------------------|
| 1            | Selection and implementation of 24 projects                                | 482        | Govt: 208<br>Non-govt: 274 | 463        | Govt: 188<br>Non-govt: 275 | 1,666             | Govt: 607<br>Non-govt: 1,059 | 2,611        | Govt: 1003<br>Non-govt: 1,608  |
| 2            | Legislative reform to promote aquaculture development                      | 3          | Govt: 3<br>Non-govt: 0     | 4          | Govt: 4<br>Non-govt: 0     | 2                 | Govt: 2<br>Non-govt: 0       | 9            | Govt: 9<br>Non-govt: 0         |
| 3            | Establishment of an inter-departmental authorisations committee            | 2          | Govt: 2<br>Non-govt: 0     | 0          | Govt: 0<br>Non-govt: 0     | 0                 | Govt: 0<br>Non-govt: 0       | 2            | Govt: 2<br>Non-govt: 0         |
| 4            | Establishment of a globally recognised monitoring and certification system | 3          | Govt: 3<br>Non-govt: 0     | 6          | Govt: 6<br>Non-govt: 0     | 18                | Govt: 18<br>Non-govt: 0      | 27           | Govt: 27<br>Non-govt: 0        |
| 5            | Establishment of an aquaculture development fund                           | 0.2        | Govt: 0.2<br>Non-govt: 0   | 1          | Govt: 1<br>Non-govt: 0     | 4                 | Govt: 4<br>Non-govt: 0       | 6            | Govt: 6<br>Non-govt: 0         |
| 6            | Capacity building for support services <sup>1</sup>                        | n/a        | n/a<br>n/a                 | n/a        | n/a<br>n/a                 | n/a               | n/a<br>n/a                   | n/a          | n/a<br>n/a                     |
| 7            | Co-ordination of industry-wide marketing efforts                           | 17         | Govt: 17<br>Non-govt: 0    | 6          | Govt: 6<br>Non-govt: 0     | 32                | Govt: 30<br>Non-govt: 2      | 55           | Govt: 53<br>Non-govt: 2        |
| 8            | Preferential procurement of aquaculture products                           | 2          | Govt: 2<br>Non-govt: 0     | 4          | Govt: 4<br>Non-govt: 0     | 1                 | Govt: 1<br>Non-govt: 0       | 7            | Govt: 7<br>Non-govt: 0         |
| <b>Total</b> |  | <b>509</b> | Govt: 235<br>Non-govt: 274 | <b>484</b> | Govt: 209<br>Non-govt: 275 | <b>1,723</b>      | Govt: 662<br>Non-govt: 1,061 | <b>2,716</b> | Govt: 1,106<br>Non-govt: 1,610 |

1 This initiative is a work in progress. The 3-foot plan, budget and KPIs will be developed post-lab  
SOURCE: Aquaculture Lab – budget template

## Aquaculture lab outcomes – headline KPIs and targets

| No.  | KPI description                                   | Baseline     | Target     |         |         |         |         |
|--|---|--------------|------------|---------|---------|---------|---------|
|  |   |              | 2014/15    | 2015/16 | 2016/17 | 2017/18 | 2018/19 |
| <b>Overall sector KPI</b>  |   |              |            |         |         |         |         |
| 1  | Production tonnage                                | 4,000 tonnes | 6,400      | 8,289   | 12,518  | 18,457  | 24,000  |
| 2  | Jobs  | 2,227 jobs   | 2,651      | 3,231   | 3,803   | 4,351   | 4,694   |
| 3  | Additional contribution to GDP                    | ZAR 0.67 bn  | ZAR 0.4 bn | 0.5 bn  | 0.9 bn  | 1.3 bn  | 1.6 bn  |
| <b>Initiative 1: Selection and implementation of 24 projects</b>             |   |              |            |         |         |         |         |
| 1  | Production tonnage                                | 1,923 tonnes | 2,401      | 4,289   | 8,518   | 14,457  | 17,939  |
| 2  | Jobs  | 762          | 1,186      | 1,766   | 2,338   | 2,886   | 3,229   |
| 3  | Revenue   | ZAR 0.3 bn   | 0.3 bn     | 0.5 bn  | 0.8 bn  | 1.2 bn  | 1.4 bn  |
| <b>Initiative 2: Legislative reform</b>                                      |   |              |            |         |         |         |         |
| 1  | Number of amendments                              | 3            | 4          | 5       | 3       |         |         |
| <b>Initiative 3: inter-departmental authorisations committee</b>             |   |              |            |         |         |         |         |
| 1  | Number of applications processed within 12 months | n/a          |            | 100%    | 100%    | 100%    | 100%    |
| <b>Initiative 4: Globally recognised monitoring and certification system</b> |   |              |            |         |         |         |         |
| 1  | Farms included in monitoring programme            | n/a          |            |         | 50%     | 75%     | 100%    |
| 2  | Increase in safe products (tonnage)               |              |            |         | 20%     | 40%     | 60%     |

## Aquaculture lab outcomes – headline KPIs and targets

| No.   | KPI description                                  | Baseline                     | Target  |         |         |         |         |
|---|--|------------------------------|---------|---------|---------|---------|---------|
|   |  |                              | 2014/15 | 2015/16 | 2016/17 | 2017/18 | 2018/19 |
| <b>Initiative 5: Aquaculture development fund</b>                           |  |                              |         |         |         |         |         |
| 1   | Number of projects funded                        | ADEP-funded projects         |         |         | 5       | 10      | 20      |
| 2   | % of projects funded with PDI ownership          |                              |         |         |         | 25%     | 25%     |
| <b>Initiative 6: Capacity building for support services (refer to DHET)</b> |  |                              |         |         |         |         |         |
| <b>Initiative 7: Industry-wide marketing efforts</b>                        |  |                              |         |         |         |         |         |
| 1   | % increase in share of shelf space               | <i>Current level unknown</i> | 2%      | 4%      | 4%      | 8%      | 10%     |
| <b>Initiative 8: preferential procurement</b>                               |  |                              |         |         |         |         |         |
| 1   | % of aquaculture products procured by government | n/a                          |         |         |         | 5%      | 10%     |

## Results schedule

The lab has identified opportunities to achieve tangible results within the next 12 months

|   | Initiative | Impact   | Timing of impact  |   |
|---|------------|--|---|---|
| 1 | Projects   | Implement 9 projects in EC, NW, KZN and WC provinces                                   | <ul style="list-style-type: none"> <li>Produce 950 tonnes and 1.9 million spat, contribute ZAR 247 million to aquaculture sector revenue, create 227 jobs</li> </ul>  |    |
| 2 | Enablers   | Raise EIA thresholds   | <ul style="list-style-type: none"> <li>Reduce time for EIA completion from 2 years to 8 months, which is a 66% reduction</li> </ul>   |    |
|   |            | Establish inter governmental authorisation committee and implement norms and standards | <ul style="list-style-type: none"> <li>Reduce of overall authorisation time from up to 2 years to 1 - 8 months (<i>with new regulations</i>)</li> </ul>   |    |
|   |            | Increase tenure of MLRA from 1 year to 2 years   | <ul style="list-style-type: none"> <li>Stabilise the aquaculture sector and improve investor confidence</li> </ul>  |   |
|   |            | Establish an aquaculture development fund  | <ul style="list-style-type: none"> <li>Create "One pot" (&gt; ZAR 500 million) for government funding, currently distributed across &gt; 5 departments</li> </ul>   |  |
|   |            | Establish an aquaculture South African industry body                                   | <ul style="list-style-type: none"> <li>Create 70 - 80 buyer relationships with local processing facilities, retailers and food service companies</li> <li>Create a comprehensive market database covering 100% of South African aquaculture production</li> </ul> |  |

# Even during the lab process, several issues faced by the industry were resolved

✓ Done  
~ In progress

## Key outcomes from the aquaculture lab

✓ Proposal to reconsider increasing the EIA thresholds legislation/regulation  
**DEA**

✓ Exemption from listing of trout as an Alien and Invasive Species where it is already established  
**DEA**

~ Access to state land for projects and zones in Phakisa  
**DPW**  
**DLDLR**

~ Access to sea space and duration of leases  
**TNPA**

## Impact on sector

Time and cost savings since the majority of farms would trigger a basic assessment (8 - 10months), instead of a full scoping and EIR (14 - 24 months)

Growth of trout farming through expansions and establishment of new farms in areas in which they already occur since farmers would not need to undertake an additional risk assessment and apply for an additional permit

The security of tenure will increase investor confidence through improved turnaround times for lease approvals and duration of leases

Investor confidence through improved turnaround times for lease approvals and duration of leases