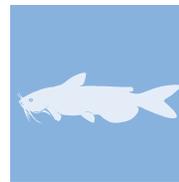
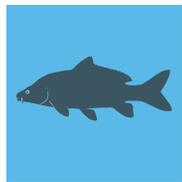
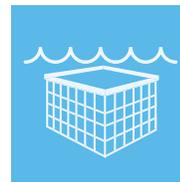
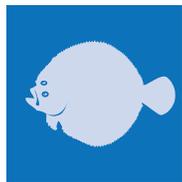




Food and Agriculture  
Organization of the  
United Nations

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COUNTRY REPORTS  
**South Africa**



Country Report Supporting the Preparation of the  
First Report on *The State of the World's Aquatic  
Genetic Resources for Food and Agriculture*

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This Country Report has been submitted by the national authorities as a contribution to the Food and Agriculture Organization of the United Nations (FAO) publication, *The State of the World's Aquatic Genetic Resources for Food and Agriculture*. The information in this Country Report has not been verified by FAO, and its content is entirely the responsibility of the entity preparing the Country Report, and does not necessarily represent the views of FAO, or its Members. The designations employed and the presentation of material do not imply the expression of any opinion whatsoever on the part of FAO concerning legal or development status of any country, territory, city or area or of its authorities or concerning the delimitation of its frontiers or boundaries. The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by FAO in preference to others of a similar nature that are not mentioned.



Food and Agriculture  
Organization of the  
United Nations

COMMISSION ON  
GENETIC RESOURCES  
FOR FOOD AND  
AGRICULTURE

**Questionnaire for the Preparation of  
Country Reports for *the First State of  
the World's Aquatic Genetic Resources  
for Food and Agriculture***

COMMISSION ON  
GENETIC RESOURCES  
FOR FOOD AND  
AGRICULTURE



## INSTRUCTIONS FOR COMPLETING THE DYNAMIC GUIDELINES

### How do I complete the dynamic guidelines?

1. You will require Adobe Reader to open the dynamic guidelines. Adobe Reader can be downloaded free of charge from: <http://get.adobe.com/uk/reader/otherversions/>. Use Adobe Reader Version 10 or higher.
2. Open the dynamic guidelines and save it (save as a pdf) on your hard drive.
3. Please rename it <name of your country>.pdf.
4. You may forward the dynamic guidelines to stakeholders you would like to involve or inform by e-mail. You may also print and/or save the dynamic guidelines.
5. It is advisable to prepare textual responses (including any formatting such as bullet points) first in a separate document and then to copy and paste them into the form. Please use font Arial 10. Acronyms and abbreviations should be avoided if possible. If included, they must be introduced (i.e. written out in full) the first time they are used. Note that the text boxes are expandable. Once text has been entered, the box will automatically enlarge to make its content fully visible when you click outside its border. To delete a row you have added, click on the "X" on the far right of the table
6. When you have finished completing the dynamic guidelines, click the "Submit form" button at the end of the form and send the completed dynamic guidelines to [Devin.Bartely@fao.org](mailto:Devin.Bartely@fao.org); [Matthias.Halwart@fao.org](mailto:Matthias.Halwart@fao.org); and [ruth.garciagomez@fao.org](mailto:ruth.garciagomez@fao.org).
7. This should automatically attach the document to an email that you can then send. Otherwise, please attach the completed dynamic guidelines manually to an e-mail and send it to [Devin.Bartely@fao.org](mailto:Devin.Bartely@fao.org); [Matthias.Halwart@fao.org](mailto:Matthias.Halwart@fao.org); and [ruth.garciagomez@fao.org](mailto:ruth.garciagomez@fao.org).
8. A letter confirming official endorsement by relevant authorities should also be attached to the email.
9. You will receive a confirmation that the submission was successful.

### Where can I get further assistance?

If you have any questions regarding the dynamic guidelines, please contact [Devin.Bartely@fao.org](mailto:Devin.Bartely@fao.org); [Matthias.Halwart@fao.org](mailto:Matthias.Halwart@fao.org); [ruth.garciagomez@fao.org](mailto:ruth.garciagomez@fao.org)

Several websites provide useful information on aquatic species that can be consulted for proper species names and for information on aquatic genetic resources: [AlgaeBase](http://www.algaebase.org), [Aquamaps](http://www.aquamaps.org), [Barcode of Life](http://www.barcodeoflife.org), [Census of Marine Life](http://www.censusofmarinelife.org), [FishBase](http://www.fishbase.org), [Frozen Ark](http://www.frozenark.org), [GenBank](http://www.genbank.org), [Global Biodiversity Information Facility](http://www.gbif.org), [International Union for Conservation of Nature](http://www.iucn.org), [National Institutes of Health Database on Genomes and Bioinformatics](http://www.nih.gov), [Ornamental Fish International](http://www.sealifebase.org), [SealifeBase](http://www.sealifebase.org), [Sea Around Us](http://www.searoundsus.org), and [World Register of Marine Species](http://www.marinespecies.org).

### How, by whom and by when must the completed dynamic guidelines be submitted?

Once officially endorsed by the relevant authorities, the completed dynamic guidelines should be submitted (click the "Submit form" button on the header banner) by the National Focal Point. **Completed dynamic guidelines should be sent by December 31<sup>st</sup> 2015.**

[www.algaebase.org](http://www.algaebase.org)  
[www.aquamaps.org](http://www.aquamaps.org)  
[www.barcodeoflife.org](http://www.barcodeoflife.org)  
[www.coml.org](http://www.coml.org)  
[www.fishbase.org](http://www.fishbase.org)  
[www.frozenark.org](http://www.frozenark.org)  
[www.genbank.org](http://www.genbank.org)  
[www.gbif.org](http://www.gbif.org)  
[www.iucn.org](http://www.iucn.org)  
<http://discover.nci.nih.gov/>  
[www.ornamental-fish-int.org](http://www.ornamental-fish-int.org)  
[www.sealifebase.org](http://www.sealifebase.org)  
[www.searoundsus.org](http://www.searoundsus.org)  
[www.marinespecies.org](http://www.marinespecies.org)

## I. INTRODUCTION

At its Thirteenth Regular Session, the Commission noted that the preparation of a country-driven *State of the World's Aquatic Genetic Resources for Food and Agriculture* would provide countries with opportunities for assessing the status of their aquatic genetic resources for food and agriculture and enhancing the contributions of aquatic genetic resources to food security and rural development. Additionally the process of producing Country Reports will assist countries in determining their needs and priorities for the conservation and sustainable use of aquatic genetic resources for food and agriculture, and will help raise awareness among policy-makers.

## II. COUNTRY REPORTS

As with the other sectors, *The State of the World's Aquatic Genetic Resources for Food and Agriculture (SoWAqGR)* will be compiled from Country Reports. It is recognized that guidance is necessary in order to assist countries in completing those reports under a common framework. The Country Reports will become official government documents submitted to FAO.

The following questionnaire is the suggested format for the preparation and submission of Country Reports. The questionnaire has been prepared by FAO to assist in the preparation of Country Reports contributing to the SoWAqGR Report. It has been designed to assist countries to undertake a strategic assessment of their aquatic genetic resources for food and agriculture.

The scope of the first State of the World's Aquatic Genetic Resources for Food and Agriculture, and therefore the emphasis in the Country Reports, is farmed aquatic species and their wild relatives within national jurisdiction.

Country Reports should:

- become powerful tools for improving the conservation, sustainable use and development of aquatic genetic resources for food and agriculture, at national and regional levels;
- identify threats to aquatic genetic resources, gaps in information about aquatic genetic resources and needs for the strengthening of national capacity to manage aquatic genetic resources effectively;
- inform the development of national policies, legislation, research and development, education, training and extension concerning the conservation, sustainable use and development of aquatic genetic resources for food and agriculture;
- contribute to raising public awareness about the importance of aquatic genetic resources for food and agriculture;
- complement other national reporting activities on the conservation, sustainable use and development of aquatic genetic resources.

### Timeline and process

In line with the overall process, as established by the Commission, the Director-General of FAO sent a Circular State Letter on 19 April 2012 to countries requesting them to identify National Focal Points for the preparation of Country Reports by 31 December, 2015.

The following steps are recommended in preparing the Country Report, using a participatory approach:

- Each participating country should appoint a National Focal Point for the coordination of the preparation of the Country Report who will also act as focal point to FAO. National Focal Points should be communicated to the Secretary, Commission on Genetic Resources for Food and Agriculture ([cgrfa@fao.org](mailto:cgrfa@fao.org)) immediately.
- Countries are encouraged to establish a national committee to oversee the preparation of the Country Report. The national committee should consist of as many representative stakeholders as practical (representing government, industry, research and civil society).
- The national committee should meet frequently to review progress and consult widely with key stakeholders.

- The National Focal Point should coordinate the preparation of the first draft of the Country Report, which should be reviewed by the national committee. The National Focal Point should facilitate a consultative process for broader stakeholder review.
- Following the stakeholder review, the National Focal Point should coordinate the finalization of the Country Report, submit it to the government for official endorsement and transmit it to FAO in one of the Organization's official languages (Arabic, Chinese, English, French, Russian and Spanish) by 31 December 2015.
- The Country Report will be an official government report.
- If countries are unable to submit final Country Reports by the set deadline, preliminary reports of findings should be provided to FAO to contribute to the identification of global priorities for inclusion in the SoWAqGR Report.

**QUESTIONNAIRE FOR PREPARATION OF COUNTRY REPORTS FOR  
THE STATE OF THE WORLD'S AQUATIC GENETIC RESOURCES FOR FOOD  
AND AGRICULTURE**

Country report supporting the preparation of  
The State of the World's Aquatic Genetic Resources for Food and Agriculture

Country	South Africa
Prepared By	Belemane Semoli
Date	Mar 24, 2016

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## I. EXECUTIVE SUMMARY

The Country Report should contain an executive summary of 2-3 pages highlighting the main findings of the analysis and providing an overview of key issues, constraints and existing capacity to address the issues and challenges. The executive summary should indicate trends and driving forces and present an overview of the proposed strategic directions for future actions aimed at the national, regional and global levels.

*Please include the Executive Summary here.*

The aquaculture sector in South Africa is still in its infancy and therefore the research on aquatic resources is still very limited and focused on management of aquatic resources and genetics is primarily focused on potential impact of farmed species on wild caught species. To date, farming of local species has primarily focused on wild caught or F1 broodstock. The main genetic research and breeding programme has focused on the local abalone species.

## II. INTRODUCTION

The main objective of the Introduction is to present an overview that will allow a person who is unfamiliar with the country to appreciate the context for the Country Report. The Introduction should present a broad overview and present background information from your country on farmed aquatic species, their wild relatives and culture based fisheries. Detailed information should be provided in the main body of the Country Report. Countries may wish to consider developing their Introductions after completing the main body of their Country Reports.

*Please write the overview here*

Species cultured in South Africa in 2013 were abalone (*Haliotis midae*), Pacific oyster (*Crassostrea gigas*), mussels (*Mytilus galloprovincialis* and *Chromomytilus meridionalis*), dusky kob (*Argyrosomus japonicus*), seaweed (*Ulva* spp and *Gracilaria* spp), trout (*Onchorynchus mykiss* and *Salmo trutta*), tilapia (*Oreochromis mossambicus*, *Oreochromis niloticus* and *Oreochromis rendalli*), catfish (*Clarias gariepinus*), carp (*Cyprinus carpio*), marron crayfish (*Cherax tenuimanus*), and a number of ornamental species (i.e. koi carp etc).

Total of 230 farms were recorded in 2013, of this 37 were marine aquaculture farms and 230 were freshwater aquaculture farms. South Africa's aquaculture sector demonstrated a substantial increase in both the marine aquaculture and freshwater industries recorded and increase of three and 32 farm respectively. The Western Cape Province had the highest number of marine aquaculture farms in 2013, 24, comprising of the four sub-sectors, namely, abalone, finfish, oysters and mussels. Mpumalanga had the highest number of freshwater water farms, 42, with the majority of farms culturing tilapia and trout. The total production of South Africa's aquaculture industry (excluding sea weed, carp, ornamentals and koi carp) in 2013 was 4 946.41 tons with the marine aquaculture industry recording 2 985.70 tons and the freshwater aquaculture industry recording 1 960.71 tons. The sector increased 1 019.52 tons recording an increase of 25.96% from 2012. The sector illustrated a grow rate of 8.7% from 2005 to 2013.

South Africa's total marine aquaculture production in 2013 increased by 724.47 tons from 2012, increasing by 30.04%. The abalone, mussels, oysters and finfish sub-sectors recorded an increase in production of 358.37 tons (32.25%), 256.37 tons (29.82%), 35.65 tons (14.75%) and 74.09 tons (152.90%) respectively.

Total freshwater aquaculture production has shown an increase of 295.04 tons (17.71%) from the year 2012 to 2013 for the four sub-sectors. The reported freshwater aquaculture production in 2013 was 1960.71 tons. The freshwater aquaculture sub-sector with the largest aquaculture production in 2013 was trout which contributed 1666 tons. The second largest sub-sector is tilapia which had a total production of 289.71 tons. The third sub-sectors include marron crayfish which contributed 5 tons. The catfish sub-sector produced zero tons in 2013.

The total value of the aquaculture sector was estimated at R 696 million, increasing by 38.1% between 2012 and 2013. This total estimated value includes freshwater and marine aquaculture industry and was based on the sales of aquaculture products. Locally aquaculture continues to be dominated by abalone production which was estimated to be R529 million in 2013, representing 76.01% of the total rand value for the entire aquaculture sector.

Projected capital investment of approximately R322 million representing an increase of 33.6% was realised in the sector during 2013. The abalone sub-sector invested approximately R223.9 million (excluding crocodile farming) during this period. These investments were primarily for further expansions to meet increasing demand. The marine finfish sub-sector has been growing rapidly over the past years and more than R78.6 million was invested in the sub-sector during 2013. The total recorded investment for mussels was R6.6 million and tilapia at R7.7 million.

The employment figure had increase to 2 831 in 2013 as a result of the projected investment into the aquaculture sector. A total of 604 jobs were created in the sector in 2013, with the majority of employment increase in the abalone sub-sector with approximately 500 employees employed in 2013.

### III. MAIN BODY OF THE COUNTRY REPORT

Aquaculture, culture-based fisheries and capture fisheries, have differing importance among countries. The structure of chapters in each Country Report will reflect those differences. Countries which do not have a well-developed aquaculture sector but where wild relatives of farmed aquatic species are located, should report on these resources. Countries should decide how to prioritize the coverage of their Country Reports depending on their aquatic genetic resources.

#### **Chapter 1: The Use and Exchange of Aquatic Genetic Resources of Farmed Aquatic Species and their Wild Relatives within National Jurisdiction**

The main objective of Chapter 1 is to provide annotated inventories of aquatic genetic resources (AqGR) of farmed aquatic species and their wild relatives.

#### **Farmed aquatic species**

1. Over the last 10 years, has production been: *Please mark appropriate box.*

- Increasing
- Stable
- Decreasing
- Stopped
- Still in Research and Development
- Fluctuating
- Not known

2. What is the expected trend over the next 10 years? *Please mark appropriate box.*

- Increasing
- Stable
- Decreasing
- Stopped
- Still in Research and Development
- Fluctuating
- Not known

3. Is the identification and naming of farmed species, subspecies, hybrids, crossbreeds, strains, triploids, other distinct types accurate and up- to-date? *Please mark appropriate box.*

- Yes
- No
- Mostly Yes
- Mostly No

*Please include any explanation or additional information here.*

Some of the aquaculture sectors such as Tilapia are not well known in South Africa, all the hybrids/crossbreeds have not been recorded.

4. To what extent are genetic data for farmed aquatic organisms

a) Available? *Please mark appropriate box.*

- Not at all
- To a minor extent
- To some extent
- To a great extent

b) Used in management? *Please mark appropriate box.*

- Not at all
- To a minor extent
- To some extent
- To a great extent

*Please add any explanation here.*

The genetics of the marine aquaculture sector are well known, management interventions have been put in place for the marine sector. The genetic data of some of the freshwater aquaculture sectors is lacking.

5. To what extent are the aquatic organisms farmed in your country sourced as wild seed or from wild brood stock?

*Please mark appropriate box.*

- Not at all
- To a minor extent
- To some extent
- To a great extent

*Please add any explanation here.*

Broodstock are mainly sourced from the wild

6. What proportions (%) of breeding programmes and efforts for the genetic improvement of farmed aquatic species in your country are being managed by the public sector (government research, universities etc.), the private sector, and public-private partnerships?

• Percent managed by public sector. **Please Enter Percentage Here**

• Percent managed by private sector. **Please Enter Percentage Here**

• Percent managed by private /public partnership. **Please Enter Percentage Here**

**Total**

*Please add any explanation here.*

The main breeding programme and genetic research is focussed on abalone culture, this programme is run by industry and looks at identifying fast breeding animals and markers for potential breeding programme.

7. To what extent do genetically improved aquatic organisms, including hybrids, crossbreeds, strains, triploids and other distinct types contribute to national aquaculture production in terms of volume ?

*Please mark appropriate box.*

- Not at all
- To a minor extent
- To some extent
- To a great extent

8. Please list most significant examples where genetic improvement contributed to increased production and indicate whether they were developed by public, private or public/private partnerships.

Add Row

Species	Type of genetic improvement <i>mark all that apply</i>	Developed By <i>mark all that apply</i>	
Oncorhynchus mykiss	<input type="checkbox"/> Traditional selective breeding	<input type="checkbox"/> Private Sector <input type="checkbox"/> Public Sector <input type="checkbox"/> Private/Public partnership	
	<input type="checkbox"/> Hybrids	<input type="checkbox"/> Private Sector <input type="checkbox"/> Public Sector <input type="checkbox"/> Private/Public partnership	
	<input type="checkbox"/> Triploids and other polyploids	<input type="checkbox"/> Private Sector <input type="checkbox"/> Public Sector <input type="checkbox"/> Private/Public partnership	X
	<input checked="" type="checkbox"/> Mono-sex production	<input checked="" type="checkbox"/> Private Sector <input type="checkbox"/> Public Sector <input type="checkbox"/> Private/Public partnership	
	<input type="checkbox"/> Other	<input type="checkbox"/> Private Sector <input type="checkbox"/> Public Sector <input type="checkbox"/> Private/Public partnership	

9. Please fill in table 1.1

**Table 1.1 Aquatic genetic resources (AqGR) of farmed aquatic species in your country**

<span style="border: 1px solid black; padding: 2px;">Add Row</span>							
Farmed species	Genetic type	Availability of genetic data	Trends in production	Future trends in production	Genetic improvement	Future genetic improvement	Comments
List species (scientific names), strains and varieties as scientific names (put in brackets the most widely used national common name or names) and indicate whether native or introduced	<i>Indicate all genetic types that apply to the species</i>	Are genetic data available for farmed populations? If yes, give summary details in comments	Over the last 10 years, production has been <b>(mark one)</b>	Expected trend over the next 10 years is that production will <b>(mark one)</b>	Which genetic technologies are currently being used on the species <b>(mark all that apply)</b>	<b>mark all that apply</b>	For example important traits improved, how data are used in management or name of breed, source of information, etc.
<input checked="" type="radio"/> Native <input type="radio"/> Introduced	<input checked="" type="checkbox"/> Wild Type <input type="checkbox"/> Selective bred type <input type="checkbox"/> Hybrids <input type="checkbox"/> Cross breeds <input type="checkbox"/> Strains <input type="checkbox"/> Varieties <input type="checkbox"/> Polyploids	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not Known	<input checked="" type="radio"/> Increasing <input type="radio"/> Stable <input type="radio"/> Fluctuating <input type="radio"/> Decreasing <input type="radio"/> Stopped <input type="radio"/> Not known	<input checked="" type="radio"/> Increasing <input type="radio"/> Stable <input type="radio"/> Fluctuating <input type="radio"/> Decreasing <input type="radio"/> Stopped <input type="radio"/> Not known	<input checked="" type="checkbox"/> Selective breeding <input type="checkbox"/> Hybridization <input type="checkbox"/> Polyploidy (chromosome set manipulation) <input type="checkbox"/> Monosex <input type="checkbox"/> Marker assisted selection <input type="checkbox"/> Other (specify in comment)	<input checked="" type="checkbox"/> Selective breeding <input type="checkbox"/> Hybridization <input type="checkbox"/> Polyploidy (chromosome set manipulation) <input type="checkbox"/> Monosex <input checked="" type="checkbox"/> Marker assisted selection <input type="checkbox"/> Other (specify in comment)	most of the broodstock are wild sourced with , with F1 generation allowed to be used as broodstock. F2 generation are not allowed to be used for broodstock.
Haliotis midae							X

<input type="radio"/> Native <input checked="" type="radio"/> Introduced	<input type="checkbox"/> Wild Type	<input checked="" type="radio"/> Yes	<input checked="" type="radio"/> Increasing	<input checked="" type="radio"/> Increasing	<input checked="" type="checkbox"/> Selective breeding	<input checked="" type="checkbox"/> Selective breeding		
Crassostrea gigas	<input checked="" type="checkbox"/> Selective bred type	<input type="radio"/> No	<input type="radio"/> Stable	<input type="radio"/> Stable	<input type="checkbox"/> Hybridization	<input type="checkbox"/> Hybridization		
	<input type="checkbox"/> Hybrids	<input type="radio"/> Not Known	<input type="radio"/> Fluctuating	<input type="radio"/> Fluctuating	<input type="checkbox"/> Polyploidy (chromosome set manipulation)	<input type="checkbox"/> Polyploidy (chromosome set manipulation)		
	<input type="checkbox"/> Cross breeds		<input type="radio"/> Decreasing	<input type="radio"/> Decreasing	<input type="checkbox"/> Monosex	<input type="checkbox"/> Monosex		
	<input type="checkbox"/> Strains		<input type="radio"/> Stopped	<input type="radio"/> Stopped	<input type="checkbox"/> Marker assisted selection	<input type="checkbox"/> Marker assisted selection	Spat is imported from Chile and Namibia	X
	<input type="checkbox"/> Varieties		<input type="radio"/> Not known	<input type="radio"/> Not known	<input type="checkbox"/> Other (specify in comment)	<input type="checkbox"/> Other (specify in comment)		
	<input type="checkbox"/> Polyploids							
<input type="radio"/> Native <input checked="" type="radio"/> Introduced	<input checked="" type="checkbox"/> Wild Type	<input type="radio"/> Yes	<input checked="" type="radio"/> Increasing	<input checked="" type="radio"/> Increasing	<input type="checkbox"/> Selective breeding	<input type="checkbox"/> Selective breeding		
Mytilus galloprovincialis	<input type="checkbox"/> Selective bred type	<input type="radio"/> No	<input type="radio"/> Stable	<input type="radio"/> Stable	<input type="checkbox"/> Hybridization	<input type="checkbox"/> Hybridization		
	<input type="checkbox"/> Hybrids	<input checked="" type="radio"/> Not Known	<input type="radio"/> Fluctuating	<input type="radio"/> Fluctuating	<input type="checkbox"/> Polyploidy (chromosome set manipulation)	<input type="checkbox"/> Polyploidy (chromosome set manipulation)		
	<input type="checkbox"/> Cross breeds		<input type="radio"/> Decreasing	<input type="radio"/> Decreasing	<input type="checkbox"/> Monosex	<input type="checkbox"/> Monosex	Seed stock collected from the natural environment	X
	<input type="checkbox"/> Strains		<input type="radio"/> Stopped	<input type="radio"/> Stopped	<input type="checkbox"/> Marker assisted selection	<input type="checkbox"/> Marker assisted selection		
	<input type="checkbox"/> Varieties <input type="checkbox"/> Polyploids				<input type="checkbox"/> Other (specify in comment)	<input type="checkbox"/> Other (specify in comment)		

<input checked="" type="radio"/> Native <input type="radio"/> Introduced	<input checked="" type="checkbox"/> Wild Type	<input type="radio"/> Yes	<input checked="" type="radio"/> Increasing	<input checked="" type="radio"/> Increasing	<input type="checkbox"/> Selective breeding	<input type="checkbox"/> Selective breeding			
Choromytilus chorus	<input type="checkbox"/> Selective bred type	<input type="radio"/> No	<input type="radio"/> Stable	<input type="radio"/> Stable	<input type="checkbox"/> Hybridization	<input type="checkbox"/> Hybridization	Choromytilus meridionalis is a local mussel species in South Africa and is cultivated with Mytilus galloprovincialis. Seed stock collected from the natural environment	X	
	<input type="checkbox"/> Hybrids	<input checked="" type="radio"/> Not Known	<input type="radio"/> Fluctuating	<input type="radio"/> Fluctuating	<input type="checkbox"/> Polyploidy (chromosome set manipulation)	<input type="checkbox"/> Polyploidy (chromosome set manipulation)			
	<input type="checkbox"/> Cross breeds		<input type="radio"/> Decreasing	<input type="radio"/> Decreasing	<input type="checkbox"/> Monosex	<input type="checkbox"/> Monosex			
	<input type="checkbox"/> Strains		<input type="radio"/> Stopped	<input type="radio"/> Stopped	<input type="checkbox"/> Marker assisted selection	<input type="checkbox"/> Marker assisted selection			
	<input type="checkbox"/> Varieties		<input type="radio"/> Not known	<input type="radio"/> Not known	<input type="checkbox"/> Other (specify in comment)	<input type="checkbox"/> Other (specify in comment)			
	<input type="checkbox"/> Polyploids								
<input checked="" type="radio"/> Native <input type="radio"/> Introduced	<input checked="" type="checkbox"/> Wild Type	<input checked="" type="radio"/> Yes	<input checked="" type="radio"/> Increasing	<input checked="" type="radio"/> Increasing	<input type="checkbox"/> Selective breeding	<input type="checkbox"/> Selective breeding	Ulva spp. are cultivated on abalone farms as a means of nutrient recycling and is fed back to the abalone. Vegetative forms are collected from the wild.		
Ulva spp	<input type="checkbox"/> Selective bred type	<input type="radio"/> No	<input type="radio"/> Stable	<input type="radio"/> Stable	<input type="checkbox"/> Hybridization	<input type="checkbox"/> Hybridization			X
	<input type="checkbox"/> Hybrids	<input type="radio"/> Not Known	<input type="radio"/> Fluctuating	<input type="radio"/> Fluctuating	<input type="checkbox"/> Polyploidy (chromosome set manipulation)	<input type="checkbox"/> Polyploidy (chromosome set manipulation)			
	<input type="checkbox"/> Cross breeds		<input type="radio"/> Decreasing	<input type="radio"/> Decreasing	<input type="checkbox"/> Monosex	<input type="checkbox"/> Monosex			
	<input type="checkbox"/> Strains		<input type="radio"/> Stopped	<input type="radio"/> Stopped	<input type="checkbox"/> Marker assisted selection	<input type="checkbox"/> Marker assisted selection			
	<input type="checkbox"/> Varieties		<input type="radio"/> Not known	<input type="radio"/> Not known	<input type="checkbox"/> Other (specify in comment)	<input type="checkbox"/> Other (specify in comment)			
	<input type="checkbox"/> Polyploids								

<input checked="" type="radio"/> Native <input type="radio"/> Introduced								
Gracilaria spp	<input checked="" type="checkbox"/> Wild Type <input type="checkbox"/> Selective bred type <input type="checkbox"/> Hybrids <input type="checkbox"/> Cross breeds <input type="checkbox"/> Strains <input type="checkbox"/> Varieties <input type="checkbox"/> Polyploids	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Not Known	<input type="radio"/> Increasing <input type="radio"/> Stable <input type="radio"/> Fluctuating <input type="radio"/> Decreasing <input type="radio"/> Stopped <input checked="" type="radio"/> Not known	<input type="radio"/> Increasing <input type="radio"/> Stable <input type="radio"/> Fluctuating <input type="radio"/> Decreasing <input type="radio"/> Stopped <input checked="" type="radio"/> Not known	<input type="checkbox"/> Selective breeding <input type="checkbox"/> Hybridization <input type="checkbox"/> Polyploidy (chromosome set manipulation) <input type="checkbox"/> Monosex <input type="checkbox"/> Marker assisted selection <input type="checkbox"/> Other (specify in comment)	<input type="checkbox"/> Selective breeding <input type="checkbox"/> Hybridization <input type="checkbox"/> Polyploidy (chromosome set manipulation) <input type="checkbox"/> Monosex <input type="checkbox"/> Marker assisted selection <input type="checkbox"/> Other (specify in comment)	Vegetative forms are collected from the wild	X
<input checked="" type="radio"/> Native <input type="radio"/> Introduced	<input checked="" type="checkbox"/> Wild Type <input type="checkbox"/> Selective bred type <input type="checkbox"/> Hybrids <input type="checkbox"/> Cross breeds <input type="checkbox"/> Strains <input type="checkbox"/> Varieties <input type="checkbox"/> Polyploids	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not Known	<input checked="" type="radio"/> Increasing <input type="radio"/> Stable <input type="radio"/> Fluctuating <input type="radio"/> Decreasing <input type="radio"/> Stopped <input type="radio"/> Not known	<input type="radio"/> Increasing <input type="radio"/> Stable <input type="radio"/> Fluctuating <input type="radio"/> Decreasing <input type="radio"/> Stopped <input checked="" type="radio"/> Not known	<input checked="" type="checkbox"/> Selective breeding <input type="checkbox"/> Hybridization <input type="checkbox"/> Polyploidy (chromosome set manipulation) <input type="checkbox"/> Monosex <input type="checkbox"/> Marker assisted selection <input type="checkbox"/> Other (specify in comment)	<input checked="" type="checkbox"/> Selective breeding <input type="checkbox"/> Hybridization <input type="checkbox"/> Polyploidy (chromosome set manipulation) <input type="checkbox"/> Monosex <input checked="" type="checkbox"/> Marker assisted selection <input type="checkbox"/> Other (specify in comment)	brodstock captured from the wild	X
Argyrosomus japonicus								

<input type="radio"/> Native <input checked="" type="radio"/> Introduced	<input type="checkbox"/> Wild Type	<input checked="" type="radio"/> Yes	<input checked="" type="radio"/> Increasing	<input checked="" type="radio"/> Increasing	<input checked="" type="checkbox"/> Selective breeding	<input checked="" type="checkbox"/> Selective breeding		
Oncorhynchus mykiss	<input checked="" type="checkbox"/> Selective bred type	<input type="radio"/> No	<input type="radio"/> Stable	<input type="radio"/> Stable	<input type="checkbox"/> Hybridization	<input type="checkbox"/> Hybridization		
	<input type="checkbox"/> Hybrids	<input type="radio"/> Not Known	<input type="radio"/> Fluctuating	<input type="radio"/> Fluctuating	<input type="checkbox"/> Polyploidy (chromosome set manipulation)	<input type="checkbox"/> Polyploidy (chromosome set manipulation)		X
	<input type="checkbox"/> Cross breeds		<input type="radio"/> Decreasing	<input type="radio"/> Decreasing	<input checked="" type="checkbox"/> Monosex	<input checked="" type="checkbox"/> Monosex		
	<input type="checkbox"/> Strains		<input type="radio"/> Stopped	<input type="radio"/> Stopped	<input type="checkbox"/> Marker assisted selection	<input checked="" type="checkbox"/> Marker assisted selection		
	<input type="checkbox"/> Varieties		<input type="radio"/> Not known	<input type="radio"/> Not known	<input type="checkbox"/> Other (specify in comment)	<input type="checkbox"/> Other (specify in comment)		
	<input type="checkbox"/> Polyploids							
<input type="radio"/> Native <input checked="" type="radio"/> Introduced	<input type="checkbox"/> Wild Type	<input type="radio"/> Yes	<input type="radio"/> Increasing	<input type="radio"/> Increasing	<input checked="" type="checkbox"/> Selective breeding	<input checked="" type="checkbox"/> Selective breeding		
Salmo trutta	<input checked="" type="checkbox"/> Selective bred type	<input type="radio"/> No	<input type="radio"/> Stable	<input type="radio"/> Stable	<input type="checkbox"/> Hybridization	<input type="checkbox"/> Hybridization		
	<input type="checkbox"/> Hybrids	<input checked="" type="radio"/> Not Known	<input type="radio"/> Fluctuating	<input type="radio"/> Fluctuating	<input type="checkbox"/> Polyploidy (chromosome set manipulation)	<input type="checkbox"/> Polyploidy (chromosome set manipulation)		X
	<input type="checkbox"/> Cross breeds		<input type="radio"/> Decreasing	<input type="radio"/> Decreasing	<input checked="" type="checkbox"/> Monosex	<input checked="" type="checkbox"/> Monosex		
	<input type="checkbox"/> Strains		<input type="radio"/> Stopped	<input type="radio"/> Stopped	<input type="checkbox"/> Marker assisted selection	<input type="checkbox"/> Marker assisted selection		
	<input type="checkbox"/> Varieties		<input checked="" type="radio"/> Not known	<input checked="" type="radio"/> Not known	<input type="checkbox"/> Other (specify in comment)	<input type="checkbox"/> Other (specify in comment)		
	<input type="checkbox"/> Polyploids							

<input checked="" type="radio"/> Native <input type="radio"/> Introduced	<input checked="" type="checkbox"/> Wild Type <input checked="" type="checkbox"/> Selective bred type <input checked="" type="checkbox"/> Hybrids <input checked="" type="checkbox"/> Cross breeds <input checked="" type="checkbox"/> Strains <input type="checkbox"/> Varieties <input type="checkbox"/> Polyploids	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Not Known	<input checked="" type="radio"/> Increasing <input type="radio"/> Stable <input type="radio"/> Fluctuating <input type="radio"/> Decreasing <input type="radio"/> Stopped <input type="radio"/> Not known	<input checked="" type="radio"/> Increasing <input type="radio"/> Stable <input type="radio"/> Fluctuating <input type="radio"/> Decreasing <input type="radio"/> Stopped <input type="radio"/> Not known	<input checked="" type="checkbox"/> Selective breeding <input checked="" type="checkbox"/> Hybridization <input type="checkbox"/> Polyploidy (chromosome set manipulation) <input checked="" type="checkbox"/> Monosex <input type="checkbox"/> Marker assisted selection <input type="checkbox"/> Other (specify in comment)	<input checked="" type="checkbox"/> Selective breeding <input checked="" type="checkbox"/> Hybridization <input type="checkbox"/> Polyploidy (chromosome set manipulation) <input checked="" type="checkbox"/> Monosex <input checked="" type="checkbox"/> Marker assisted selection <input type="checkbox"/> Other (specify in comment)	<p>The full extent of this sector is not yet known in South Africa</p>	X
<input type="radio"/> Native <input checked="" type="radio"/> Introduced	<input checked="" type="checkbox"/> Wild Type <input checked="" type="checkbox"/> Selective bred type <input checked="" type="checkbox"/> Hybrids <input type="checkbox"/> Cross breeds <input checked="" type="checkbox"/> Strains <input type="checkbox"/> Varieties <input type="checkbox"/> Polyploids	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Not Known	<input type="radio"/> Increasing <input type="radio"/> Stable <input type="radio"/> Fluctuating <input type="radio"/> Decreasing <input type="radio"/> Stopped <input checked="" type="radio"/> Not known	<input type="radio"/> Increasing <input type="radio"/> Stable <input type="radio"/> Fluctuating <input type="radio"/> Decreasing <input type="radio"/> Stopped <input checked="" type="radio"/> Not known	<input checked="" type="checkbox"/> Selective breeding <input type="checkbox"/> Hybridization <input type="checkbox"/> Polyploidy (chromosome set manipulation) <input checked="" type="checkbox"/> Monosex <input type="checkbox"/> Marker assisted selection <input type="checkbox"/> Other (specify in comment)	<input type="checkbox"/> Selective breeding <input checked="" type="checkbox"/> Hybridization <input type="checkbox"/> Polyploidy (chromosome set manipulation) <input checked="" type="checkbox"/> Monosex <input checked="" type="checkbox"/> Marker assisted selection <input type="checkbox"/> Other (specify in comment)	<p>The full extent of this sector is not yet known in South Africa. The level of hybridization with local species is not known.</p>	X
<input checked="" type="radio"/> Native <input type="radio"/> Introduced	<input checked="" type="checkbox"/> Wild Type <input checked="" type="checkbox"/> Selective bred type <input checked="" type="checkbox"/> Hybrids <input checked="" type="checkbox"/> Cross breeds <input checked="" type="checkbox"/> Strains <input type="checkbox"/> Varieties <input type="checkbox"/> Polyploids	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Not Known	<input checked="" type="radio"/> Increasing <input type="radio"/> Stable <input type="radio"/> Fluctuating <input type="radio"/> Decreasing <input type="radio"/> Stopped <input type="radio"/> Not known	<input checked="" type="radio"/> Increasing <input type="radio"/> Stable <input type="radio"/> Fluctuating <input type="radio"/> Decreasing <input type="radio"/> Stopped <input type="radio"/> Not known	<input checked="" type="checkbox"/> Selective breeding <input checked="" type="checkbox"/> Hybridization <input type="checkbox"/> Polyploidy (chromosome set manipulation) <input checked="" type="checkbox"/> Monosex <input type="checkbox"/> Marker assisted selection <input type="checkbox"/> Other (specify in comment)	<input checked="" type="checkbox"/> Selective breeding <input checked="" type="checkbox"/> Hybridization <input type="checkbox"/> Polyploidy (chromosome set manipulation) <input checked="" type="checkbox"/> Monosex <input checked="" type="checkbox"/> Marker assisted selection <input type="checkbox"/> Other (specify in comment)	<p>The full extent of this sector is not yet known in South Africa. The level of hybridization with local species is not known.</p>	X
<input type="radio"/> Native <input checked="" type="radio"/> Introduced	<input checked="" type="checkbox"/> Wild Type <input checked="" type="checkbox"/> Selective bred type <input checked="" type="checkbox"/> Hybrids <input type="checkbox"/> Cross breeds <input checked="" type="checkbox"/> Strains <input type="checkbox"/> Varieties <input type="checkbox"/> Polyploids	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Not Known	<input type="radio"/> Increasing <input type="radio"/> Stable <input type="radio"/> Fluctuating <input type="radio"/> Decreasing <input type="radio"/> Stopped <input checked="" type="radio"/> Not known	<input type="radio"/> Increasing <input type="radio"/> Stable <input type="radio"/> Fluctuating <input type="radio"/> Decreasing <input type="radio"/> Stopped <input checked="" type="radio"/> Not known	<input checked="" type="checkbox"/> Selective breeding <input type="checkbox"/> Hybridization <input type="checkbox"/> Polyploidy (chromosome set manipulation) <input checked="" type="checkbox"/> Monosex <input type="checkbox"/> Marker assisted selection <input type="checkbox"/> Other (specify in comment)	<input type="checkbox"/> Selective breeding <input checked="" type="checkbox"/> Hybridization <input type="checkbox"/> Polyploidy (chromosome set manipulation) <input checked="" type="checkbox"/> Monosex <input checked="" type="checkbox"/> Marker assisted selection <input type="checkbox"/> Other (specify in comment)	<p>The full extent of this sector is not yet known in South Africa. The level of hybridization with local species is not known.</p>	X

<input checked="" type="radio"/> Native <input type="radio"/> Introduced	<input checked="" type="checkbox"/> Wild Type <input checked="" type="checkbox"/> Selective bred type <input type="checkbox"/> Hybrids <input type="checkbox"/> Cross breeds <input checked="" type="checkbox"/> Strains <input type="checkbox"/> Varieties <input type="checkbox"/> Polyploids	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not Known	<input type="radio"/> Increasing <input type="radio"/> Stable <input checked="" type="radio"/> Fluctuating <input type="radio"/> Decreasing <input type="radio"/> Stopped <input type="radio"/> Not known	<input checked="" type="radio"/> Increasing <input type="radio"/> Stable <input type="radio"/> Fluctuating <input type="radio"/> Decreasing <input type="radio"/> Stopped <input type="radio"/> Not known	<input checked="" type="checkbox"/> Selective breeding <input type="checkbox"/> Hybridization <input type="checkbox"/> Polyploidy (chromosome set manipulation) <input type="checkbox"/> Monosex <input type="checkbox"/> Marker assisted selection <input type="checkbox"/> Other (specify in comment)	<input checked="" type="checkbox"/> Selective breeding <input type="checkbox"/> Hybridization <input type="checkbox"/> Polyploidy (chromosome set manipulation) <input checked="" type="checkbox"/> Monosex <input checked="" type="checkbox"/> Marker assisted selection <input type="checkbox"/> Other (specify in comment)	currently limited production in South Africa, with plans to expand the sector	X
<input type="radio"/> Native <input checked="" type="radio"/> Introduced	<input checked="" type="checkbox"/> Wild Type <input type="checkbox"/> Selective bred type <input type="checkbox"/> Hybrids <input type="checkbox"/> Cross breeds <input type="checkbox"/> Strains <input type="checkbox"/> Varieties <input type="checkbox"/> Polyploids	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Not Known	<input type="radio"/> Increasing <input type="radio"/> Stable <input type="radio"/> Fluctuating <input type="radio"/> Decreasing <input type="radio"/> Stopped <input checked="" type="radio"/> Not known	<input type="radio"/> Increasing <input type="radio"/> Stable <input type="radio"/> Fluctuating <input type="radio"/> Decreasing <input type="radio"/> Stopped <input checked="" type="radio"/> Not known	<input type="checkbox"/> Selective breeding <input type="checkbox"/> Hybridization <input type="checkbox"/> Polyploidy (chromosome set manipulation) <input type="checkbox"/> Monosex <input type="checkbox"/> Marker assisted selection <input type="checkbox"/> Other (specify in comment)	<input type="checkbox"/> Selective breeding <input type="checkbox"/> Hybridization <input type="checkbox"/> Polyploidy (chromosome set manipulation) <input type="checkbox"/> Monosex <input type="checkbox"/> Marker assisted selection <input type="checkbox"/> Other (specify in comment)	limited information available for the sector	X
<input checked="" type="radio"/> Native <input type="radio"/> Introduced	<input checked="" type="checkbox"/> Wild Type <input checked="" type="checkbox"/> Selective bred type <input type="checkbox"/> Hybrids <input type="checkbox"/> Cross breeds <input checked="" type="checkbox"/> Strains <input type="checkbox"/> Varieties <input type="checkbox"/> Polyploids	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not Known	<input type="radio"/> Increasing <input type="radio"/> Stable <input checked="" type="radio"/> Fluctuating <input type="radio"/> Decreasing <input type="radio"/> Stopped <input type="radio"/> Not known	<input checked="" type="radio"/> Increasing <input type="radio"/> Stable <input type="radio"/> Fluctuating <input type="radio"/> Decreasing <input type="radio"/> Stopped <input type="radio"/> Not known	<input checked="" type="checkbox"/> Selective breeding <input type="checkbox"/> Hybridization <input type="checkbox"/> Polyploidy (chromosome set manipulation) <input type="checkbox"/> Monosex <input type="checkbox"/> Marker assisted selection <input type="checkbox"/> Other (specify in comment)	<input checked="" type="checkbox"/> Selective breeding <input type="checkbox"/> Hybridization <input type="checkbox"/> Polyploidy (chromosome set manipulation) <input checked="" type="checkbox"/> Monosex <input checked="" type="checkbox"/> Marker assisted selection <input type="checkbox"/> Other (specify in comment)	currently limited production in South Africa, with plans to expand the sector	X
<input type="radio"/> Native <input checked="" type="radio"/> Introduced	<input checked="" type="checkbox"/> Wild Type <input type="checkbox"/> Selective bred type <input type="checkbox"/> Hybrids <input type="checkbox"/> Cross breeds <input type="checkbox"/> Strains <input type="checkbox"/> Varieties <input type="checkbox"/> Polyploids	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Not Known	<input type="radio"/> Increasing <input type="radio"/> Stable <input type="radio"/> Fluctuating <input type="radio"/> Decreasing <input type="radio"/> Stopped <input checked="" type="radio"/> Not known	<input type="radio"/> Increasing <input type="radio"/> Stable <input type="radio"/> Fluctuating <input type="radio"/> Decreasing <input type="radio"/> Stopped <input checked="" type="radio"/> Not known	<input type="checkbox"/> Selective breeding <input type="checkbox"/> Hybridization <input type="checkbox"/> Polyploidy (chromosome set manipulation) <input type="checkbox"/> Monosex <input type="checkbox"/> Marker assisted selection <input type="checkbox"/> Other (specify in comment)	<input type="checkbox"/> Selective breeding <input type="checkbox"/> Hybridization <input type="checkbox"/> Polyploidy (chromosome set manipulation) <input type="checkbox"/> Monosex <input type="checkbox"/> Marker assisted selection <input type="checkbox"/> Other (specify in comment)	limited information available for the sector	X

<input type="radio"/> Native <input checked="" type="radio"/> Introduced								
Cherax tenuimanus	<input type="checkbox"/> Wild Type <input checked="" type="checkbox"/> Selective bred type	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Not Known	<input checked="" type="radio"/> Increasing <input type="radio"/> Stable <input type="radio"/> Fluctuating <input type="radio"/> Decreasing <input type="radio"/> Stopped <input type="radio"/> Not known	<input checked="" type="radio"/> Increasing <input type="radio"/> Stable <input type="radio"/> Fluctuating <input type="radio"/> Decreasing <input type="radio"/> Stopped <input type="radio"/> Not known	<input checked="" type="checkbox"/> Selective breeding <input type="checkbox"/> Hybridization	<input checked="" type="checkbox"/> Selective breeding <input type="checkbox"/> Hybridization		
	<input type="checkbox"/> Hybrids <input type="checkbox"/> Cross breeds <input type="checkbox"/> Strains <input type="checkbox"/> Varieties <input type="checkbox"/> Polyploids				<input type="checkbox"/> Polyploidy (chromosome set manipulation) <input type="checkbox"/> Monosex <input type="checkbox"/> Marker assisted selection <input type="checkbox"/> Other (specify in comment)	<input type="checkbox"/> Polyploidy (chromosome set manipulation) <input type="checkbox"/> Monosex <input checked="" type="checkbox"/> Marker assisted selection <input type="checkbox"/> Other (specify in comment)	<p>sector very small within South Africa with 11.5 tons produced between 2006 -2013. plans are in place to expand the sector.</p>	X

10. Which aquatic species in your country are thought to have potential for domestication and future use in aquaculture?

Add Row

Species <i>Type and select a species</i>	Is the species native to your country?	Comments <i>For example main sources of information</i>	
Seriola spp  	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not Known	Research scale operations are currently underway to culture <i>Seriola lalandi</i> (yellowtail) in South Africa	<input checked="" type="checkbox"/>
Rhabdosargus sarba  	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not Known	brood stock kept on farm premises for conditioning and research	<input checked="" type="checkbox"/>
Epinephelus areolatus  	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not Known	brood stock kept on farm premises for conditioning and research	<input checked="" type="checkbox"/>

Lutjanus argentimaculatus	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not Known	brood stock kept on farm premises for conditioning and research	X
<div data-bbox="105 583 532 655" style="border: 1px solid black; padding: 2px;">Tripneustes gratilla</div>	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not Known	Research on this urchin species is at the advanced stages with the species ready for pilot commercial trials	X
<div data-bbox="105 1129 532 1201" style="border: 1px solid black; padding: 2px;">Pectinidae</div>	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not Known	Local species of scallop being researched for cultivation	X

Arenicola loveni

Yes

No

Not Known

brood stock kept on farm premises for conditioning and research

X

11. Please list the aquatic genetic resources of farmed aquatic species your country has transferred or exchanged with other countries over the past 10 years.

Add Row					
Species	Genetic alteration of exchanged material <b>Mark all that apply</b>	Details of transfer or exchange	Type of genetic material exchanged <b>Mark all that apply</b>	Country or countries involved with exchange <b>Hold CTRL button to select more than one country</b>	Comments <i>Please add main purpose or objective of the exchange and main sources of information</i>
Oreochromis niloticus	<input checked="" type="checkbox"/> No deliberate genetic alteration <input type="checkbox"/> Traditional selective breeding <input type="checkbox"/> Hybrids <input type="checkbox"/> Triploids and other polyploids <input type="checkbox"/> Mono-sex production <input type="checkbox"/> Other	<input type="checkbox"/> Import <input checked="" type="checkbox"/> Export	<input type="checkbox"/> DNA <input type="checkbox"/> Genes <input type="checkbox"/> Gametes <input type="checkbox"/> Tissues <input type="checkbox"/> Embryos <input checked="" type="checkbox"/> Living specimens <input type="checkbox"/> Other	Thailand Timor-Leste Togo Tokelau (Associate Member) Tonga Trinidad and Tobago Tunisia Turkey Turkmenistan Tuvalu Uganda Ukraine United Arab Emirates United Kingdom United Republic of Tanzania United States of America Uruguay	X

### Wild relatives of farmed aquatic species

12. Please list any wild relatives of aquatic species present in your country that are farmed in another country (but not in your country) and indicate their uses.

This question refers to aquatic genetic resources that are present in the wild in your country and that are being farmed elsewhere (but not farmed in your country), indicating any uses these resources may have in your country.

Add Row

Species	Use <i>(mark all that apply)</i>	Comments	
	<input type="checkbox"/> Capture fisheries		
	<input type="checkbox"/> Recreational fishery		
	<input type="checkbox"/> Aquaria		
	<input type="checkbox"/> Biological control		
	<input type="checkbox"/> Research and development		X
	<input type="checkbox"/> Other (specify in comments)		

13. Please list the aquatic genetic resources of wild relatives of farmed aquatic species your country has transferred or exchanged with other countries over the past 10 years.

Add Row

This question refers to wild aquatic genetic resources collected from the wild, not from farming facilities as in question 11.

Species	Details of transfer or exchange <i>mark all that apply</i>	Type of genetic material exchanged	Country <b>Hold CTRL button to select more than one country</b>	Comments <i>main sources of information, if the transfer was legal or not</i>	
Crassostrea gigas	<input checked="" type="checkbox"/> Import <input type="checkbox"/> Export	<input type="checkbox"/> Tissues <input type="checkbox"/> Gametes <input type="checkbox"/> DNA <input type="checkbox"/> Genes <input type="checkbox"/> Embryos <input checked="" type="checkbox"/> Living specimens <input type="checkbox"/> Other	Bhutan Bolivia (Plurinational State of) Bosnia and Herzegovina Brazil Brunei Darussalam Bulgaria Burkina Faso Burundi Cabo Verde Cambodia Cameroon Canada Central African Republic Chad Chile China	Pacific oyster spat are imported from Chile and Namibia in part.	X
Oncorhynchus mykiss	<input checked="" type="checkbox"/> Import <input checked="" type="checkbox"/> Export	<input type="checkbox"/> Tissues <input type="checkbox"/> Gametes <input type="checkbox"/> DNA <input type="checkbox"/> Genes <input checked="" type="checkbox"/> Embryos <input type="checkbox"/> Living specimens <input type="checkbox"/> Other	Chad Chile China Colombia Comoros Cook Islands Costa Rica Côte d'Ivoire Croatia Cuba Cyprus Czech Republic Republic of Korea Democratic Republic of the Congo Denmark Djibouti	Ova is imported into South Africa over summer and exported over winter	X



Target species, stocks or other management units	Characteristics of species	Capture fisheries	Management measures	Availability of genetic data	Use of genetic data in management	Trends in catches	Future trends in catches	Ecosystem(s) where the fishery is located	Changes in ranges and habitats	Reasons for change in abundance of species	
Mytilus galloprovincialis	<input type="checkbox"/> Straddling <input checked="" type="checkbox"/> Transboundary <input checked="" type="checkbox"/> Introduced <input type="checkbox"/> Native	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not Known	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not Known	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not Known	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Not Known	<input type="radio"/> Increasing <input type="radio"/> Stable <input type="radio"/> Fluctuating <input type="radio"/> Decreasing <input type="radio"/> Depleted <input checked="" type="radio"/> Not known	<input type="radio"/> Increasing <input type="radio"/> Stable <input type="radio"/> Fluctuating <input type="radio"/> Decreasing <input type="radio"/> Depleted <input checked="" type="radio"/> Not known	<input checked="" type="checkbox"/> Intertidal <input type="checkbox"/> Coastal in EEZ <input type="checkbox"/> High seas <input type="checkbox"/> Lake <input type="checkbox"/> Reservoir <input type="checkbox"/> River <input type="checkbox"/> Swamp <input type="checkbox"/> Other (specify) <div style="border: 1px solid black; height: 20px; width: 100%; margin-top: 5px;"></div>	<input type="radio"/> Increasing <input checked="" type="radio"/> Stable <input type="radio"/> Decreasing <input type="radio"/> Not known	<input type="checkbox"/> Habitat <input type="checkbox"/> Climate <input checked="" type="checkbox"/> Invasive species <input type="checkbox"/> Pollution <input type="checkbox"/> Rehabilitation of habitat <input type="checkbox"/> Others <input type="checkbox"/> Not known	X
Argyrosomus japonicus	<input type="checkbox"/> Straddling <input checked="" type="checkbox"/> Transboundary <input type="checkbox"/> Introduced <input checked="" type="checkbox"/> Native	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not Known	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not Known	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not Known	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not Known	<input type="radio"/> Increasing <input type="radio"/> Stable <input checked="" type="radio"/> Fluctuating <input type="radio"/> Decreasing <input type="radio"/> Depleted <input type="radio"/> Not known	<input type="radio"/> Increasing <input type="radio"/> Stable <input type="radio"/> Fluctuating <input type="radio"/> Decreasing <input type="radio"/> Depleted <input checked="" type="radio"/> Not known	<input type="checkbox"/> Intertidal <input checked="" type="checkbox"/> Coastal in EEZ <input type="checkbox"/> High seas <input type="checkbox"/> Lake <input type="checkbox"/> Reservoir <input type="checkbox"/> River <input type="checkbox"/> Swamp <input type="checkbox"/> Other (specify) <div style="border: 1px solid black; height: 20px; width: 100%; margin-top: 5px;"></div>	<input type="radio"/> Increasing <input checked="" type="radio"/> Stable <input type="radio"/> Decreasing <input type="radio"/> Not known	<input type="checkbox"/> Habitat <input type="checkbox"/> Climate <input type="checkbox"/> Invasive species <input type="checkbox"/> Pollution <input type="checkbox"/> Rehabilitation of habitat <input type="checkbox"/> Others <input type="checkbox"/> Not known	X

Target species, stocks or other management units	Characteristics of species	Capture fisheries	Management measures	Availability of genetic data	Use of genetic data in management	Trends in catches	Future trends in catches	Ecosystem(s) where the fishery is located	Changes in ranges and habitats	Reasons for change in abundance of species	
Seriola lalandi	<input type="checkbox"/> Straddling <input checked="" type="checkbox"/> Transboundary <input type="checkbox"/> Introduced <input checked="" type="checkbox"/> Native	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not Known	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not Known	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not Known	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Not Known	<input type="radio"/> Increasing <input checked="" type="radio"/> Stable <input type="radio"/> Fluctuating <input type="radio"/> Decreasing <input type="radio"/> Depleted <input type="radio"/> Not known	<input type="radio"/> Increasing <input checked="" type="radio"/> Stable <input type="radio"/> Fluctuating <input type="radio"/> Decreasing <input type="radio"/> Depleted <input type="radio"/> Not known	<input type="checkbox"/> Intertidal <input checked="" type="checkbox"/> Coastal in EEZ <input checked="" type="checkbox"/> High seas <input type="checkbox"/> Lake <input type="checkbox"/> Reservoir <input type="checkbox"/> River <input type="checkbox"/> Swamp <input type="checkbox"/> Other (specify) <div style="border: 1px solid black; height: 20px; width: 100%; margin-top: 5px;"></div>	<input type="radio"/> Increasing <input checked="" type="radio"/> Stable <input type="radio"/> Decreasing <input type="radio"/> Not known	<input type="checkbox"/> Habitat <input type="checkbox"/> Climate <input type="checkbox"/> Invasive species <input type="checkbox"/> Pollution <input type="checkbox"/> Rehabilitation of habitat <input type="checkbox"/> Others <input type="checkbox"/> Not known	X
Oncorhynchus mykiss	<input type="checkbox"/> Straddling <input type="checkbox"/> Transboundary <input checked="" type="checkbox"/> Introduced <input type="checkbox"/> Native	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not Known	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Not Known	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Not Known	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Not Known	<input type="radio"/> Increasing <input type="radio"/> Stable <input type="radio"/> Fluctuating <input type="radio"/> Decreasing <input type="radio"/> Depleted <input checked="" type="radio"/> Not known	<input type="radio"/> Increasing <input type="radio"/> Stable <input type="radio"/> Fluctuating <input type="radio"/> Decreasing <input type="radio"/> Depleted <input checked="" type="radio"/> Not known	<input type="checkbox"/> Intertidal <input type="checkbox"/> Coastal in EEZ <input type="checkbox"/> High seas <input type="checkbox"/> Lake <input type="checkbox"/> Reservoir <input checked="" type="checkbox"/> River <input type="checkbox"/> Swamp <input type="checkbox"/> Other (specify) <div style="border: 1px solid black; height: 20px; width: 100%; margin-top: 5px;"></div>	<input type="radio"/> Increasing <input type="radio"/> Stable <input type="radio"/> Decreasing <input checked="" type="radio"/> Not known	<input type="checkbox"/> Habitat <input type="checkbox"/> Climate <input type="checkbox"/> Invasive species <input type="checkbox"/> Pollution <input type="checkbox"/> Rehabilitation of habitat <input type="checkbox"/> Others <input checked="" type="checkbox"/> Not known	X

Target species, stocks or other management units	Characteristics of species	Capture fisheries	Management measures	Availability of genetic data	Use of genetic data in management	Trends in catches	Future trends in catches	Ecosystem(s) where the fishery is located	Changes in ranges and habitats	Reasons for change in abundance of species	
Salmo trutta	<input type="checkbox"/> Straddling <input type="checkbox"/> Transboundary <input checked="" type="checkbox"/> Introduced <input type="checkbox"/> Native	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not Known	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Not Known	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Not Known	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Not Known	<input type="radio"/> Increasing <input type="radio"/> Stable <input type="radio"/> Fluctuating <input type="radio"/> Decreasing <input type="radio"/> Depleted <input checked="" type="radio"/> Not known	<input type="radio"/> Increasing <input type="radio"/> Stable <input type="radio"/> Fluctuating <input type="radio"/> Decreasing <input type="radio"/> Depleted <input checked="" type="radio"/> Not known	<input type="checkbox"/> Intertidal <input type="checkbox"/> Coastal in EEZ <input type="checkbox"/> High seas <input checked="" type="checkbox"/> Lake <input checked="" type="checkbox"/> Reservoir <input checked="" type="checkbox"/> River <input type="checkbox"/> Swamp <input type="checkbox"/> Other (specify) <div style="border: 1px solid black; height: 20px; width: 100%; margin-top: 5px;"></div>	<input type="radio"/> Increasing <input type="radio"/> Stable <input type="radio"/> Decreasing <input checked="" type="radio"/> Not known	<input type="checkbox"/> Habitat <input type="checkbox"/> Climate <input type="checkbox"/> Invasive species <input type="checkbox"/> Pollution <input type="checkbox"/> Rehabilitation of habitat <input type="checkbox"/> Others <input checked="" type="checkbox"/> Not known	X
Oreochromis mossambicus	<input type="checkbox"/> Straddling <input checked="" type="checkbox"/> Transboundary <input type="checkbox"/> Introduced <input checked="" type="checkbox"/> Native	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not Known	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Not Known	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Not Known	<input type="radio"/> Yes <input type="radio"/> No <input checked="" type="radio"/> Not Known	<input type="radio"/> Increasing <input type="radio"/> Stable <input type="radio"/> Fluctuating <input type="radio"/> Decreasing <input type="radio"/> Depleted <input checked="" type="radio"/> Not known	<input type="radio"/> Increasing <input type="radio"/> Stable <input type="radio"/> Fluctuating <input type="radio"/> Decreasing <input type="radio"/> Depleted <input checked="" type="radio"/> Not known	<input type="checkbox"/> Intertidal <input type="checkbox"/> Coastal in EEZ <input type="checkbox"/> High seas <input checked="" type="checkbox"/> Lake <input checked="" type="checkbox"/> Reservoir <input checked="" type="checkbox"/> River <input checked="" type="checkbox"/> Swamp <input type="checkbox"/> Other (specify) <div style="border: 1px solid black; height: 20px; width: 100%; margin-top: 5px;"></div>	<input type="radio"/> Increasing <input type="radio"/> Stable <input type="radio"/> Decreasing <input checked="" type="radio"/> Not known	<input type="checkbox"/> Habitat <input type="checkbox"/> Climate <input type="checkbox"/> Invasive species <input type="checkbox"/> Pollution <input type="checkbox"/> Rehabilitation of habitat <input type="checkbox"/> Others <input checked="" type="checkbox"/> Not known	X

## Chapter 2: Drivers and Trends in Aquaculture: Consequences for Aquatic Genetic Resources within National Jurisdiction

The main objective of Chapter 2 is to review the main drivers and trends that are shaping aquaculture and their consequences for aquatic genetic resources.

15. Please indicate the ways the aquatic genetic resources (AqGR) of **farmed aquatic species** have been impacted by the following drivers. Please give examples of positive and negative impacts for specific drivers.

This question refers to drivers impacting farmed aquatic genetic resources, not about impacts on the entire aquaculture sector. Drivers should be seen from a national perspective.

Driver impacting aquaculture	Effect on AqGR <i>Mark appropriate box</i>	Comments <i>List examples or other relevant information</i>
Human population increase	<input type="radio"/> Strongly positive <input type="radio"/> Positive <input type="radio"/> Negative <input type="radio"/> Strongly negative <input checked="" type="radio"/> No effect <input type="radio"/> Unknown	Aquaculture species produced in SA are currently high value species
Increased wealth and demand for fish	<input type="radio"/> Strongly positive <input type="radio"/> Positive <input type="radio"/> Negative <input type="radio"/> Strongly negative <input type="radio"/> No effect <input checked="" type="radio"/> Unknown	
Governance (ability of government, industry and the public to work together in managing resources)	<input type="radio"/> Strongly positive <input checked="" type="radio"/> Positive <input type="radio"/> Negative <input type="radio"/> Strongly negative <input type="radio"/> No effect <input type="radio"/> Unknown	Combined research of dusky kob genetics has assisted industry and government with management measures.
Climate change	<input type="radio"/> Strongly positive <input type="radio"/> Positive <input type="radio"/> Negative <input type="radio"/> Strongly negative <input checked="" type="radio"/> No effect <input type="radio"/> Unknown	
Competition for resources, especially freshwater	<input type="radio"/> Strongly positive <input type="radio"/> Positive <input type="radio"/> Negative <input type="radio"/> Strongly negative <input type="radio"/> No effect <input checked="" type="radio"/> Unknown	

Driver impacting aquaculture	Effect on AqGR <i>Mark appropriate box</i>	Comments <i>List examples or other relevant information</i>
Changes in values and ethics of consumers	<input type="radio"/> Strongly positive <input type="radio"/> Positive <input type="radio"/> Negative <input type="radio"/> Strongly negative <input type="radio"/> No effect <input checked="" type="radio"/> Unknown	
Other <b>Add other drivers as necessary</b>	<input type="radio"/> Strongly positive <input type="radio"/> Positive <input type="radio"/> Negative <input type="radio"/> Strongly negative <input type="radio"/> No effect <input type="radio"/> Unknown	
Add Row	Remove Row	

16. Please indicate the ways the aquatic genetic resources of **wild relatives of farmed aquatic species** in nature have been impacted by the following drivers. Please give examples of positive and negative impacts for specific drivers.

This question refers to drivers impacting wild aquatic genetic resources of farmed species, not about impacts on the entire aquaculture sector. Drivers should be seen from a national perspective.

Driver impacting aquaculture	Effect on AqGR <i>Mark appropriate box</i>	Comments <i>List examples or other relevant information</i>
Human population increase	<input type="radio"/> Strongly positive <input type="radio"/> Positive <input checked="" type="radio"/> Negative <input type="radio"/> Strongly negative <input type="radio"/> No effect <input type="radio"/> Unknown	
Increased wealth and demand for fish	<input type="radio"/> Strongly positive <input type="radio"/> Positive <input checked="" type="radio"/> Negative <input type="radio"/> Strongly negative <input type="radio"/> No effect <input type="radio"/> Unknown	
Governance (ability of government, industry and the public to work together in managing resources)	<input type="radio"/> Strongly positive <input checked="" type="radio"/> Positive <input type="radio"/> Negative <input type="radio"/> Strongly negative <input type="radio"/> No effect <input type="radio"/> Unknown	
Climate change	<input type="radio"/> Strongly positive <input type="radio"/> Positive <input type="radio"/> Negative <input type="radio"/> Strongly negative <input type="radio"/> No effect <input checked="" type="radio"/> Unknown	
Competition for resources, especially freshwater	<input type="radio"/> Strongly positive <input type="radio"/> Positive <input type="radio"/> Negative <input type="radio"/> Strongly negative <input type="radio"/> No effect <input checked="" type="radio"/> Unknown	

Driver impacting aquaculture	Effect on AqGR <i>Mark appropriate box</i>	Comments <i>List examples or other relevant information</i>
Changes in values and ethics of consumers	<input type="radio"/> Strongly positive <input type="radio"/> Positive <input type="radio"/> Negative <input type="radio"/> Strongly negative <input type="radio"/> No effect <input checked="" type="radio"/> Unknown	
Other <b>Add other drivers as necessary</b>	<input type="radio"/> Strongly positive <input type="radio"/> Positive <input type="radio"/> Negative <input type="radio"/> Strongly negative <input type="radio"/> No effect <input type="radio"/> Unknown	
Add Row	Remove Row	

17. What countermeasures might be taken to reduce adverse impacts on the aquatic genetic resources that sustain current aquaculture and/or provide for its future development?

*Describe countermeasures*

restriction of animal movement between distinct genetic zones, i.e. *halotis midae*.

The restriction of animals within specific zones.

Quota systems in the fishing industry.

stop the fishing of specific species to allow the population to recover.

**Biotechnologies**

18. To what extent have the following biotechnologies been used in your country for the genetic improvement of farmed aquatic organisms.

Biotechnology	Extent of use	Comments <i>main sources of information, important species for which the biotechnology is applied</i>
Selective breeding	<input type="radio"/> Not at all <input type="radio"/> To a minor extent <input checked="" type="radio"/> To some extent <input type="radio"/> To a great extent	O. niloticus and Clarius gariepinus
Hybridization	<input type="radio"/> Not at all <input type="radio"/> To a minor extent <input checked="" type="radio"/> To some extent <input type="radio"/> To a great extent	O. niloticus and O. mossambicus
Polyploidy (chromosome set manipulation)	<input type="radio"/> Not at all <input checked="" type="radio"/> To a minor extent <input type="radio"/> To some extent <input type="radio"/> To a great extent	Oncorhynchus mykiss
Monosex production	<input type="radio"/> Not at all <input type="radio"/> To a minor extent <input checked="" type="radio"/> To some extent <input type="radio"/> To a great extent	Oncorhynchus mykiss, O. niloticus and O. mossambicus
Marker assisted selection	<input checked="" type="radio"/> Not at all <input type="radio"/> To a minor extent <input type="radio"/> To some extent <input type="radio"/> To a great extent	Marker research on abalone has been tested but no clear results have been shown
Gynogenesis/androgenesis	<input type="radio"/> Not at all <input checked="" type="radio"/> To a minor extent <input type="radio"/> To some extent <input type="radio"/> To a great extent	
Other <b>Continue adding row as necessary</b>	<input type="radio"/> Not at all <input type="radio"/> To a minor extent <input type="radio"/> To some extent <input type="radio"/> To a great extent	
Add Row	Remove Row	

19. Please indicate the ways aquatic genetic resources of the wild relatives of farmed aquatic species have been impacted by drivers that are changing aquatic ecosystems. Please give countermeasures that might be taken to reduce adverse consequences for the aquatic genetic resources that sustain capture fisheries on wild relatives of farmed species.

Drivers that are changing aquatic ecosystems	Effect on AqGR <i>mark appropriate box</i>	Countermeasures and effects
Habitat loss and degradation	<input type="radio"/> Strongly positive <input type="radio"/> Positive <input checked="" type="radio"/> Negative <input type="radio"/> Strongly negative <input type="radio"/> No effect <input type="radio"/> Unknown	effects mainly in the freshwater ecosystems. strengthen law enforcement
Pollution of waters	<input type="radio"/> Strongly positive <input type="radio"/> Positive <input checked="" type="radio"/> Negative <input type="radio"/> Strongly negative <input type="radio"/> No effect <input type="radio"/> Unknown	strengthen legislation and law enforcement, to reduce pollution and implementation of the polluter pays principal under the National Environmental Management Act.
Increased frequency of extreme climatic events and long-term climate change	<input type="radio"/> Strongly positive <input type="radio"/> Positive <input type="radio"/> Negative <input type="radio"/> Strongly negative <input type="radio"/> No effect <input checked="" type="radio"/> Unknown	the freshwater sector is more vulnerable, especially due to lower rainfall. More scientific information is required
Establishment of invasive species	<input type="radio"/> Strongly positive <input type="radio"/> Positive <input checked="" type="radio"/> Negative <input type="radio"/> Strongly negative <input type="radio"/> No effect <input type="radio"/> Unknown	legislation is being developed to limit the movement of invasive species in the country.
Introductions of parasites and pathogens	<input type="radio"/> Strongly positive <input type="radio"/> Positive <input checked="" type="radio"/> Negative <input type="radio"/> Strongly negative <input type="radio"/> No effect <input type="radio"/> Unknown	strengthen disease monitoring

Drivers that are changing aquatic ecosystems	Effect on AqGR <i>mark appropriate box</i>	Countermeasures and effects
Impacts of purposeful stocking and escapes from aquaculture	<input type="radio"/> Strongly positive <input type="radio"/> Positive <input type="radio"/> Negative <input type="radio"/> Strongly negative <input type="radio"/> No effect <input checked="" type="radio"/> Unknown	
Capture fisheries	<input type="radio"/> Strongly positive <input type="radio"/> Positive <input checked="" type="radio"/> Negative <input type="radio"/> Strongly negative <input type="radio"/> No effect <input type="radio"/> Unknown	Capture fisheries has plateaued in the country and has decreased due to the decline of certain species stocks
Other	<input type="radio"/> Strongly positive <input type="radio"/> Positive <input type="radio"/> Negative <input type="radio"/> Strongly negative <input type="radio"/> No effect <input type="radio"/> Unknown	
<b>Continue listing other driverst</b>	<input type="radio"/> Positive <input type="radio"/> Negative <input type="radio"/> Strongly negative <input type="radio"/> No effect <input type="radio"/> Unknown	
	<input type="radio"/> Strongly negative <input type="radio"/> No effect <input type="radio"/> Unknown	
Add Row	Remove Row	

### Chapter 3: *In Situ* Conservation of Aquatic Genetic Resources of Farmed Aquatic Species and their wild Relatives within National Jurisdiction

The main objective of Chapter 3 is to review the current status and future prospects for the *in situ* conservation of aquatic genetic resources of farmed aquatic species and their wild relatives within national jurisdiction for food and agriculture.

The specific objectives are as follows:

- To review the current and likely future contributions to *in situ* conservation of aquatic genetic resources of farmed aquatic species and their wild relatives by those who use them in responsible and well managed capture fisheries, aquaculture, and culture-based fisheries.
- To identify and describe any existing and planned aquatic protected areas that are contributing, or will contribute, to *in situ* conservation of aquatic genetic resources of wild relatives of farmed aquatic species.
- To identify and describe any major existing and planned efforts for the *in situ* conservation of threatened or endangered aquatic genetic resources (farmed and wild).
- To review needs and priorities for the future development of *in situ* conservation of aquatic genetic resources of farmed aquatic species and their wild relatives.

#### Overview of the current status and future prospects for the *in situ* conservation of aquatic genetic resources of farmed aquatic species and their wild relatives

20. To what extent are responsible and well managed aquaculture and culture-based fisheries contributing to *in situ* conservation of the aquatic genetic resources of farmed aquatic species and their wild relatives.

*Please mark appropriate box.*

- To a great extent
- To a limited extent
- Not at all
- Not applicable

*Please include any additional information*

Limited extend has been indicated as the aquaculture industry is fairly small in South Africa. the marine sector is well managed. Abalone ranching is aimed at increasing wild populations to some degree and includes breeding on farms.

21. To what extent are existing facilities contributing to *in situ* conservation of aquatic genetic resources of wild relatives of farmed aquatic species?

**Please mark appropriate box.**

- To a great extent  
 To a limited extent  
 Not at all  
 Not applicable

**Please include any additional information**

Limited extend has been indicated as the aquaculture industry is fairly small in South Africa. the marine sector is well managed. Abalone ranching is aimed at increasing wild populations to some degree and includes breeding on farms.

22. Please provide *examples* of current or planned activities for the *in situ* conservation of endangered or threatened farmed species and their wild relatives with demonstrated or potential importance for aquaculture, culture-based fisheries, and capture fisheries.

**Please describe examples**

Abalone ranching - currently abalone ranching is in the pilot phase in South Africa. in this process juvenile abalone are placed in the sea to grow-out under natural conditions until harvestable size. This will reduce the fishing pressure on natural stocks.

23. Please rank (from 1 to 10) the importance of the following objectives for *in situ* conservation of aquatic genetic resources of farmed aquatic species and their wild relatives in your country.

Objectives of <i>in situ</i> conservation	Rank 1=Very Important 10=No importance
Preservation of aquatic genetic diversity	<input type="text" value="1"/>
Maintain good strains for aquaculture production	<input type="text" value="1"/>
Meet consumer and market demands	<input type="text" value="2"/>
To help adapt to impacts of climate change	<input type="text" value="3"/>
Future breed improvement in aquaculture	<input type="text" value="2"/>
<b><i>Please continue listing any other objectives as needed</i></b>	<input type="text"/>
Add Row	

**Review of the *in situ* conservation of aquatic genetic resources of farmed aquatic species and their wild relatives through their use in responsible and well managed aquaculture and culture-based fisheries**

24. Is the *in situ* conservation of aquatic genetic resources included in the policy as an objective in the management of aquaculture and/or culture-based fisheries in your country?

***Please mark appropriate box***

- Yes  
 Not yet, but planned to be included  
 No  
 Unknown

***If yes, please give examples***

Currently there is national legislation in place to maintain *in situ* conservation of aquatic resources broadly, for example the Marine Living Resources act and the National Environmental Management Biodiversity Act, Threatened and Protected Species Act.

25. To what extent are collectors of wild seed and brood stock for aquaculture and culture-based fisheries contributing to the conservation of aquatic genetic resources by maintaining habitats and/or limiting the quantities collected?

***Please mark appropriate box***

- To a great extent  
 To a limited extent  
 Not at all  
 Not applicable

***Please include any additional details***

Brood stock collection is regulated in the marine sector of the aquaculture industry.

**Review of the *in situ* conservation of aquatic genetic resources of farmed aquatic species and their wild relatives through their use in responsible and well managed capture fisheries**

26. Is the conservation of aquatic genetic resources of wild relatives of farmed aquatic species included as an objective in the management of any capture fisheries in your country?

*Please mark appropriate box*

*If yes, please give examples*

- Yes  
 Not yet, but under development  
 No  
 Unknown

currently marine fisheries management legislation is in place in the Marine Living Resources Act, freshwater fisheries management takes place at the provincial sphere of government through various provincial ordinances, which fall under the ambit of the National Environmental Management Act. the National freshwater fisheries policy is also currently being developed.

**Review of the *in situ* conservation of aquatic genetic resources of farmed aquatic species and their wild relatives through the establishment and management of aquatic protected areas**

27. Please list any aquatic protected areas in your country that are contributing to the *in situ* conservation of aquatic genetic resources of wild relatives of farmed aquatic species and an assessment of effectiveness

Add Row

Aquatic protected area	Effectiveness of conserving Aquatic Genetic Resources	Comments <i>provide any additional information</i>	
West Coast National Park MPA	<input type="radio"/> Very effective <input checked="" type="radio"/> Somewhat effective <input type="radio"/> Not effective <input type="radio"/> Unknown	<p>in both the marine as well as the freshwater sectors protected areas have been delineated. currently there is an expansion strategy for the Marine protected areas. these protected areas fall under the National Environmental Management: Protected Areas Act.</p> <p>The West Coast National Park (WCNP) MPAs are of national and global significance. The marine habitats represented by the five MPAs within the WCNP include exposed and sheltered sandy beaches and rocky shores, a lagoon, mud flats, salt marshes, subtidal reefs and sandy benthos.</p> <p>protected area regulations are in place under the legislation of the MLRA and the NEM: PAA</p>	X
Table Mountain National Park MPA	<input type="radio"/> Very effective <input checked="" type="radio"/> Somewhat effective <input type="radio"/> Not effective <input type="radio"/> Unknown	<p>in both the marine as well as the freshwater sectors protected areas have been delineated. currently there is an expansion strategy for the Marine protected areas. these protected areas fall under the National Environmental Management: Protected Areas Act.</p> <p>protected area regulations are in place under the legislation of the MLRA and the NEM: PAA</p>	X

Aquatic protected area	Effectiveness of conserving Aquatic Genetic Resources	Comments <i>provide any additional information</i>	
Tsitsikamma National Park MPA	<input type="radio"/> Very effective <input checked="" type="radio"/> Somewhat effective <input type="radio"/> Not effective <input type="radio"/> Unknown	<p>in both the marine as well as the freshwater sectors protected areas have been delineated. currently there is an expansion strategy for the Marine protected areas. these protected areas fall under the National Environmental Management: Protected Areas Act. protected area regulations are in place under the legislation of the MLRA and the NEM: PAA</p>	X
Bird Island MPA – Algoa Bay	<input type="radio"/> Very effective <input checked="" type="radio"/> Somewhat effective <input type="radio"/> Not effective <input type="radio"/> Unknown	<p>in both the marine as well as the freshwater sectors protected areas have been delineated. currently there is an expansion strategy for the Marine protected areas. these protected areas fall under the National Environmental Management: Protected Areas Act. protected area regulations are in place under the legislation of the MLRA and the NEM: PAA</p>	X
Betty's Bay MPA	<input type="radio"/> Very effective <input checked="" type="radio"/> Somewhat effective <input type="radio"/> Not effective <input type="radio"/> Unknown	<p>in both the marine as well as the freshwater sectors protected areas have been delineated. currently there is an expansion strategy for the Marine protected areas. these protected areas fall under the National Environmental Management: Protected Areas Act. protected area regulations are in place under the legislation of the MLRA and the NEM: PAA</p>	X
De Hoop MPA	<input type="radio"/> Very effective <input checked="" type="radio"/> Somewhat effective <input type="radio"/> Not effective <input type="radio"/> Unknown	<p>in both the marine as well as the freshwater sectors protected areas have been delineated. currently there is an expansion strategy for the Marine protected areas. these protected areas fall under the National Environmental Management: Protected Areas Act. protected area regulations are in place under the legislation of the MLRA and the NEM: PAA</p>	X
Stilbaai MPA	<input type="radio"/> Very effective <input checked="" type="radio"/> Somewhat effective <input type="radio"/> Not effective <input type="radio"/> Unknown	<p>in both the marine as well as the freshwater sectors protected areas have been delineated. currently there is an expansion strategy for the Marine protected areas. these protected areas fall under the National Environmental Management: Protected Areas Act. protected area regulations are in place under the legislation of the MLRA and the NEM: PAA</p>	X
Goukamma MPA	<input type="radio"/> Very effective <input checked="" type="radio"/> Somewhat effective <input type="radio"/> Not effective <input type="radio"/> Unknown	<p>in both the marine as well as the freshwater sectors protected areas have been delineated. currently there is an expansion strategy for the Marine protected areas. these protected areas fall under the National Environmental Management: Protected Areas Act. protected area regulations are in place under the legislation of the MLRA and the NEM: PAA</p>	X

Aquatic protected area	Effectiveness of conserving Aquatic Genetic Resources	Comments <i>provide any additional information</i>	
Robberg MPA	<input type="radio"/> Very effective <input checked="" type="radio"/> Somewhat effective <input type="radio"/> Not effective <input type="radio"/> Unknown	<p>in both the marine as well as the freshwater sectors protected areas have been delineated. currently there is an expansion strategy for the Marine protected areas. these protected areas fall under the National Environmental Management: Protected Areas Act. protected area regulations are in place under the legislation of the MLRA and the NEM: PAA</p>	X
Overview: CapeNature Islands	<input type="radio"/> Very effective <input checked="" type="radio"/> Somewhat effective <input type="radio"/> Not effective <input type="radio"/> Unknown	<p>in both the marine as well as the freshwater sectors protected areas have been delineated. currently there is an expansion strategy for the Marine protected areas. these protected areas fall under the National Environmental Management: Protected Areas Act. protected area regulations are in place under the legislation of the MLRA and the NEM: PAA</p>	X
Bird Island Nature Reserve	<input type="radio"/> Very effective <input checked="" type="radio"/> Somewhat effective <input type="radio"/> Not effective <input type="radio"/> Unknown	<p>in both the marine as well as the freshwater sectors protected areas have been delineated. currently there is an expansion strategy for the Marine protected areas. these protected areas fall under the National Environmental Management: Protected Areas Act. protected area regulations are in place under the legislation of the MLRA and the NEM: PAA</p>	X
Dassen Island Nature Reserve	<input type="radio"/> Very effective <input checked="" type="radio"/> Somewhat effective <input type="radio"/> Not effective <input type="radio"/> Unknown	<p>in both the marine as well as the freshwater sectors protected areas have been delineated. currently there is an expansion strategy for the Marine protected areas. these protected areas fall under the National Environmental Management: Protected Areas Act. protected area regulations are in place under the legislation of the MLRA and the NEM: PAA</p>	X
Dyer Island Nature Reserve	<input type="radio"/> Very effective <input checked="" type="radio"/> Somewhat effective <input type="radio"/> Not effective <input type="radio"/> Unknown	<p>in both the marine as well as the freshwater sectors protected areas have been delineated. currently there is an expansion strategy for the Marine protected areas. these protected areas fall under the National Environmental Management: Protected Areas Act. protected area regulations are in place under the legislation of the MLRA and the NEM: PAA</p>	X
Amathole MPA	<input type="radio"/> Very effective <input checked="" type="radio"/> Somewhat effective <input type="radio"/> Not effective <input type="radio"/> Unknown	<p>in both the marine as well as the freshwater sectors protected areas have been delineated. currently there is an expansion strategy for the Marine protected areas. these protected areas fall under the National Environmental Management: Protected Areas Act. protected area regulations are in place under the legislation of the MLRA and the NEM: PAA</p>	X

Aquatic protected area	Effectiveness of conserving Aquatic Genetic Resources	Comments <i>provide any additional information</i>	
Dwesa-Cwebe MPA	<input type="radio"/> Very effective <input checked="" type="radio"/> Somewhat effective <input type="radio"/> Not effective <input type="radio"/> Unknown	<p>in both the marine as well as the freshwater sectors protected areas have been delineated. currently there is an expansion strategy for the Marine protected areas. these protected areas fall under the National Environmental Management: Protected Areas Act. protected area regulations are in place under the legislation of the MLRA and the NEM: PAA</p>	X
Hluleka MPA	<input type="radio"/> Very effective <input checked="" type="radio"/> Somewhat effective <input type="radio"/> Not effective <input type="radio"/> Unknown	<p>in both the marine as well as the freshwater sectors protected areas have been delineated. currently there is an expansion strategy for the Marine protected areas. these protected areas fall under the National Environmental Management: Protected Areas Act. protected area regulations are in place under the legislation of the MLRA and the NEM: PAA</p>	X
Pondoland MPA	<input type="radio"/> Very effective <input checked="" type="radio"/> Somewhat effective <input type="radio"/> Not effective <input type="radio"/> Unknown	<p>in both the marine as well as the freshwater sectors protected areas have been delineated. currently there is an expansion strategy for the Marine protected areas. these protected areas fall under the National Environmental Management: Protected Areas Act. protected area regulations are in place under the legislation of the MLRA and the NEM: PAA</p>	X
Ezemvelo KwaZulu-Natal Overview	<input type="radio"/> Very effective <input checked="" type="radio"/> Somewhat effective <input type="radio"/> Not effective <input type="radio"/> Unknown	<p>in both the marine as well as the freshwater sectors protected areas have been delineated. currently there is an expansion strategy for the Marine protected areas. these protected areas fall under the National Environmental Management: Protected Areas Act. protected area regulations are in place under the legislation of the MLRA and the NEM: PAA</p>	X
Trafalgar MPA	<input type="radio"/> Very effective <input checked="" type="radio"/> Somewhat effective <input type="radio"/> Not effective <input type="radio"/> Unknown	<p>in both the marine as well as the freshwater sectors protected areas have been delineated. currently there is an expansion strategy for the Marine protected areas. these protected areas fall under the National Environmental Management: Protected Areas Act. protected area regulations are in place under the legislation of the MLRA and the NEM: PAA</p>	X
Aliwal Shoal MPA	<input type="radio"/> Very effective <input checked="" type="radio"/> Somewhat effective <input type="radio"/> Not effective <input type="radio"/> Unknown	<p>in both the marine as well as the freshwater sectors protected areas have been delineated. currently there is an expansion strategy for the Marine protected areas. these protected areas fall under the National Environmental Management: Protected Areas Act. protected area regulations are in place under the legislation of the MLRA and the NEM: PAA</p>	X

Aquatic protected area	Effectiveness of conserving Aquatic Genetic Resources	Comments <i>provide any additional information</i>	
iSimangaliso Wetland Park MPA	<input type="radio"/> Very effective <input checked="" type="radio"/> Somewhat effective <input type="radio"/> Not effective <input type="radio"/> Unknown	<p>in both the marine as well as the freshwater sectors protected areas have been delineated. currently there is an expansion strategy for the Marine protected areas. these protected areas fall under the National Environmental Management: Protected Areas Act. protected area regulations are in place under the legislation of the MLRA and the NEM: PAA</p>	X
Helderberg MPA	<input type="radio"/> Very effective <input checked="" type="radio"/> Somewhat effective <input type="radio"/> Not effective <input type="radio"/> Unknown	<p>in both the marine as well as the freshwater sectors protected areas have been delineated. currently there is an expansion strategy for the Marine protected areas. these protected areas fall under the National Environmental Management: Protected Areas Act. protected area regulations are in place under the legislation of the MLRA and the NEM: PAA</p>	X
Sardinia Bay MPA	<input type="radio"/> Very effective <input checked="" type="radio"/> Somewhat effective <input type="radio"/> Not effective <input type="radio"/> Unknown	<p>in both the marine as well as the freshwater sectors protected areas have been delineated. currently there is an expansion strategy for the Marine protected areas. these protected areas fall under the National Environmental Management: Protected Areas Act. protected area regulations are in place under the legislation of the MLRA and the NEM: PAA</p>	X

#### Chapter 4: *Ex Situ* Conservation of Aquatic Genetic Resources of Farmed Aquatic Species and their Wild Relatives within National Jurisdiction

The main objective of Chapter 4 is to review the current status and future prospects for the *ex situ* conservation of aquatic genetic resources of farmed aquatic species and their wild relatives.

The specific objectives are:

- To review existing *ex situ* conservation of aquatic genetic resources of farmed aquatic species and their wild relatives in aquaculture facilities, culture collections and gene banks, research facilities, zoos and aquaria;
- To review the contributions that various stakeholders are making to the *ex situ* conservation of aquatic genetic resources of farmed aquatic species and their wild relatives;
- To review needs and priorities for the future development of *ex situ* conservation of aquatic genetic resources of farmed aquatic species and their wild relatives, including any that are threatened or endangered.

#### Review of existing and planned collections of live breeding individuals of aquatic genetic resources of farmed aquatic species and their wild relatives

28. Please list your country's existing collections of live breeding aquatic organisms that can be considered as contributing to the *ex situ* conservation of aquatic genetic resources. This includes not only collections of species farmed directly for human use, but also collections of live feed organisms (e.g., bacterial flocs, yeasts, microalgae, rotifers and brine shrimp (*Artemia*)).

Add Row				
Species (include information on subspecies or strain in comments if available)	Type of use <i>Please mark all that apply</i>	Is the species (or subspecies) threatened or endangered for example in the IUCN Red List, CITES Appendices or national lists? <i>Please mark appropriate box</i>	Comments <i>Please list any additional information</i>	
	<input type="checkbox"/> Direct human consumption <input type="checkbox"/> Live feed organism <input type="checkbox"/> Other	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Unknown		X

**Review of existing *ex situ* conservation activities of aquatic genetic resources of farmed aquatic species and their wild relatives *in vitro*.**

29. Please list your country's *in vitro* collections and gene banks of the gametes, embryos, tissues, spores and other quiescent forms of farmed aquatic species and their wild relatives, using cryopreservation or other methods of long-term storage. Describe the major examples, identifying the facilities in which the collections are held. Include examples of any such genetic material from your country that is being kept in *in vitro* collections outside your country on behalf of beneficiaries in your country.

Add Row					
Species (include information on subspecies or strain if available in comments)	Users and managers <i>List all that apply</i>	Type of <i>ex-situ</i> conservation collection <i>in vitro</i> <i>mark all that apply</i>	Facilities where collection is located <i>mark all that apply</i>	Comments <i>list all breeds, subspecies of the species and any additional information</i>	
		<input type="checkbox"/> In vitro collection of gametes <input type="checkbox"/> In vitro collection of embryos <input type="checkbox"/> In vitro collection of tissues <input type="checkbox"/> Spores <input type="checkbox"/> Other	<input type="checkbox"/> Aquaculture facilities <input type="checkbox"/> Research facilities <input type="checkbox"/> Universities <input type="checkbox"/> Zoos and aquaria <input type="checkbox"/> Other		X

30. Please rank (from 1 – 10) the importance of the following objectives for ex situ conservation of aquatic genetic resources of farmed aquatic species and their wild relatives in your country

Objectives of <i>ex situ</i> conservation	Rank 1=Very Important 10=No importance
Preservation of aquatic genetic diversity	4
Maintain good strains for aquaculture production	1
Meet consumer and market demands	4
To help adapt to impacts of climate change	3
Future breed improvement in aquaculture	2
Other <i>Continue adding row as necessary</i>	
Add Row	Remove Row

## **Chapter 5: Stakeholders with Interests in Aquatic Genetic Resources of Farmed Aquatic Species and their Wild Relatives within National Jurisdiction**

The main objective of Chapter 5 is to provide an overview of the perspectives and needs of the principal stakeholders who have interests in aquatic genetic resources of farmed aquatic species and their wild relatives for food and agriculture. Stakeholder groups can be identified from existing institutional knowledge, from sectoral and sub-sectoral consultations conducted during the country reporting process and where necessary from expert opinions. Gender issues pertaining to the conservation, sustainable use and development of aquatic genetic resources of farmed aquatic species and their wild relatives should be considered, as well as the perspectives and needs of indigenous peoples and local communities.

The specific objectives are:

- To describe the different principal stakeholder groups with interests in aquatic genetic resources of farmed aquatic species and their wild relatives To identify the type(s) of aquatic genetic resources of farmed aquatic species and their wild relatives in which each stakeholder group has interests and why.
- To describe the roles of stakeholder groups and the actions they are taking for the conservation, sustainable use and development of the aquatic genetic resources in which they have interests.
- To describe the further actions that stakeholder groups would like to see taken for the conservation, sustainable use and development of aquatic genetic resources in which they have interests, and the constraints that are hindering those actions, including lack of capacity and perceived threats.

**Overview of the principal stakeholder groups who have interests in aquatic genetic resources of farmed aquatic species and their wild relatives**

31. Please indicate the principal stakeholder groups who have interests in aquatic genetic resources of farmed aquatic species and their wild relatives including, *inter alia*: fish farmers; fishers in capture fisheries; persons involved in stocking and harvesting in culture-based fisheries; persons employed in postharvest chains; government officials; staff and members of aquaculture associations; managers of aquatic protected areas and others working for the conservation of aquatic ecosystems; researchers; and civil society.

Stakeholders	Role of stakeholder in regards og AqGR <i>mark all that apply</i>	Genetic resource of main interest <i>mark all that apply</i>	Comments <i>Please provide any information or explanation of stakeholders' role</i>
Fish Farmers	<input checked="" type="checkbox"/> Conservation <input checked="" type="checkbox"/> Production <input checked="" type="checkbox"/> Feed manufacturing <input checked="" type="checkbox"/> Breeding <input checked="" type="checkbox"/> Research <input checked="" type="checkbox"/> Marketing <input checked="" type="checkbox"/> Processing <input type="checkbox"/> Advocacy <input type="checkbox"/> Outreach/Extension <input type="checkbox"/> Other ( <b>specify</b> ) <div style="border: 1px solid black; height: 20px; width: 100%; margin-top: 5px;"></div>	<input type="checkbox"/> DNA <input checked="" type="checkbox"/> Stock, breed or variety <input checked="" type="checkbox"/> Species <input type="checkbox"/> Other	
Fishers	<input checked="" type="checkbox"/> Conservation <input checked="" type="checkbox"/> Production <input type="checkbox"/> Feed manufacturing <input type="checkbox"/> Breeding <input type="checkbox"/> Research <input checked="" type="checkbox"/> Marketing <input checked="" type="checkbox"/> Processing <input type="checkbox"/> Advocacy <input type="checkbox"/> Outreach/Extension <input type="checkbox"/> Other ( <b>specify</b> ) <div style="border: 1px solid black; height: 20px; width: 100%; margin-top: 5px;"></div>	<input type="checkbox"/> DNA <input checked="" type="checkbox"/> Stock, breed or variety <input checked="" type="checkbox"/> Species <input type="checkbox"/> Other	

Stakeholders	Role of stakeholder in regards og AqGR <i>mark all that apply</i>	Genetic resource of main interest <i>mark all that apply</i>	Comments <i>Please provide any information or explanation of stakeholders' role</i>
Fish hatchery people	<input checked="" type="checkbox"/> Conservation <input checked="" type="checkbox"/> Production <input checked="" type="checkbox"/> Feed manufacturing <input checked="" type="checkbox"/> Breeding <input type="checkbox"/> Research <input checked="" type="checkbox"/> Marketing <input checked="" type="checkbox"/> Processing <input type="checkbox"/> Advocacy <input type="checkbox"/> Outreach/Extension <input type="checkbox"/> Other ( <b>specify</b> ) <div style="border: 1px solid black; height: 20px; width: 100%; margin-top: 5px;"></div>	<input type="checkbox"/> DNA <input checked="" type="checkbox"/> Stock, breed or variety <input checked="" type="checkbox"/> Species <input type="checkbox"/> Other	
People involved in marketing	<input type="checkbox"/> Conservation <input type="checkbox"/> Production <input type="checkbox"/> Feed manufacturing <input checked="" type="checkbox"/> Breeding <input type="checkbox"/> Research <input checked="" type="checkbox"/> Marketing <input type="checkbox"/> Processing <input type="checkbox"/> Advocacy <input type="checkbox"/> Outreach/Extension <input type="checkbox"/> Other ( <b>specify</b> ) <div style="border: 1px solid black; height: 20px; width: 100%; margin-top: 5px;"></div>	<input type="checkbox"/> DNA <input type="checkbox"/> Stock, breed or variety <input checked="" type="checkbox"/> Species <input type="checkbox"/> Other	
Government resource managers	<input checked="" type="checkbox"/> Conservation <input checked="" type="checkbox"/> Production <input checked="" type="checkbox"/> Feed manufacturing <input checked="" type="checkbox"/> Breeding <input checked="" type="checkbox"/> Research <input type="checkbox"/> Marketing <input type="checkbox"/> Processing <input type="checkbox"/> Advocacy <input checked="" type="checkbox"/> Outreach/Extension <input type="checkbox"/> Other ( <b>specify</b> ) <div style="border: 1px solid black; height: 20px; width: 100%; margin-top: 5px;"></div>	<input checked="" type="checkbox"/> DNA <input checked="" type="checkbox"/> Stock, breed or variety <input checked="" type="checkbox"/> Species <input type="checkbox"/> Other	

Stakeholders	Role of stakeholder in regards og AqGR <i>mark all that apply</i>	Genetic resource of main interest <i>mark all that apply</i>	Comments <i>Please provide any information or explanation of stakeholders' role</i>
Fishing or aquaculture associations	<input type="checkbox"/> Conservation <input checked="" type="checkbox"/> Production <input checked="" type="checkbox"/> Feed manufacturing <input checked="" type="checkbox"/> Breeding <input checked="" type="checkbox"/> Research <input checked="" type="checkbox"/> Marketing <input type="checkbox"/> Processing <input type="checkbox"/> Advocacy <input type="checkbox"/> Outreach/Extension <input type="checkbox"/> Other ( <b>specify</b> ) <input type="text"/>	<input type="checkbox"/> DNA <input checked="" type="checkbox"/> Stock, breed or variety <input checked="" type="checkbox"/> Species <input type="checkbox"/> Other	
Aquatic protected area managers	<input checked="" type="checkbox"/> Conservation <input type="checkbox"/> Production <input type="checkbox"/> Feed manufacturing <input checked="" type="checkbox"/> Breeding <input checked="" type="checkbox"/> Research <input type="checkbox"/> Marketing <input type="checkbox"/> Processing <input checked="" type="checkbox"/> Advocacy <input checked="" type="checkbox"/> Outreach/Extension <input type="checkbox"/> Other ( <b>specify</b> ) <input type="text"/>	<input checked="" type="checkbox"/> DNA <input type="checkbox"/> Stock, breed or variety <input type="checkbox"/> Species <input type="checkbox"/> Other	
Policy Makers	<input checked="" type="checkbox"/> Conservation <input checked="" type="checkbox"/> Production <input type="checkbox"/> Feed manufacturing <input checked="" type="checkbox"/> Breeding <input checked="" type="checkbox"/> Research <input type="checkbox"/> Marketing <input checked="" type="checkbox"/> Processing <input type="checkbox"/> Advocacy <input type="checkbox"/> Outreach/Extension <input type="checkbox"/> Other ( <b>specify</b> ) <input type="text"/>	<input type="checkbox"/> DNA <input checked="" type="checkbox"/> Stock, breed or variety <input checked="" type="checkbox"/> Species <input type="checkbox"/> Other	

Stakeholders	Role of stakeholder in regards og AqGR <i>mark all that apply</i>	Genetic resource of main interest <i>mark all that apply</i>	Comments <i>Please provide any information or explanation of stakeholders' role</i>
Non-Governmental Organizations	<input checked="" type="checkbox"/> Conservation <input type="checkbox"/> Production <input type="checkbox"/> Feed manufacturing <input type="checkbox"/> Breeding <input type="checkbox"/> Research <input type="checkbox"/> Marketing <input type="checkbox"/> Processing <input checked="" type="checkbox"/> Advocacy <input checked="" type="checkbox"/> Outreach/Extension <input type="checkbox"/> Other ( <b>specify</b> ) <div style="border: 1px solid black; height: 20px; width: 100%; margin-top: 5px;"></div>	<input type="checkbox"/> DNA <input checked="" type="checkbox"/> Stock, breed or variety <input type="checkbox"/> Species <input type="checkbox"/> Other	
Intergovernmental Organizations	<input type="checkbox"/> Conservation <input checked="" type="checkbox"/> Production <input type="checkbox"/> Feed manufacturing <input checked="" type="checkbox"/> Breeding <input checked="" type="checkbox"/> Research <input type="checkbox"/> Marketing <input type="checkbox"/> Processing <input type="checkbox"/> Advocacy <input checked="" type="checkbox"/> Outreach/Extension <input type="checkbox"/> Other ( <b>specify</b> ) <div style="border: 1px solid black; height: 20px; width: 100%; margin-top: 5px;"></div>	<input type="checkbox"/> DNA <input type="checkbox"/> Stock, breed or variety <input type="checkbox"/> Species <input type="checkbox"/> Other	
Donors	<input checked="" type="checkbox"/> Conservation <input checked="" type="checkbox"/> Production <input type="checkbox"/> Feed manufacturing <input type="checkbox"/> Breeding <input type="checkbox"/> Research <input type="checkbox"/> Marketing <input type="checkbox"/> Processing <input type="checkbox"/> Advocacy <input checked="" type="checkbox"/> Outreach/Extension <input type="checkbox"/> Other ( <b>specify</b> ) <div style="border: 1px solid black; height: 20px; width: 100%; margin-top: 5px;"></div>	<input type="checkbox"/> DNA <input checked="" type="checkbox"/> Stock, breed or variety <input checked="" type="checkbox"/> Species <input type="checkbox"/> Other	

Stakeholders	Role of stakeholder in regards og AqGR <i>mark all that apply</i>	Genetic resource of main interest <i>mark all that apply</i>	Comments <i>Please provide any information or explanation of stakeholders' role</i>
Consumers	<input type="checkbox"/> Conservation <input checked="" type="checkbox"/> Production <input type="checkbox"/> Feed manufacturing <input type="checkbox"/> Breeding <input type="checkbox"/> Research <input checked="" type="checkbox"/> Marketing <input type="checkbox"/> Processing <input type="checkbox"/> Advocacy <input type="checkbox"/> Outreach/Extension <input type="checkbox"/> Other ( <b>specify</b> ) <div style="border: 1px solid black; height: 20px; width: 150px; margin-top: 5px;"></div>	<input type="checkbox"/> DNA <input type="checkbox"/> Stock, breed or variety <input checked="" type="checkbox"/> Species <input type="checkbox"/> Other	

a) Please indicate the most important role of women in regards to AqGR

Women could play a role in all parts of AqGR: Breeding, research, production, etc.

b) Please indicate the most important role of indigenous and local communities in regards to AqGR

In situ conservation interventions would require the buy in from local communities in order to be effective, this includes protected areas, management of broodstock, implementation of breeding programmes, harvesting of depleted stock.

## Chapter 6: National Policies and Legislation for Aquatic Genetic Resources of Farmed Aquatic Species and their Wild Relatives within National Jurisdiction

The main objective of Chapter 6 is to review the status and adequacy of national policies and legislation concerning aquatic genetic resources of farmed aquatic species and their wild relatives including access and benefit sharing.

The specific objectives are as follows:

- To describe the existing national policy and legal framework for the conservation, sustainable use and development of aquatic genetic resources of farmed aquatic species and their wild relatives.
- To review current national policies and instruments for access to aquatic genetic resources of farmed aquatic species and their wild relatives and the fair and equitable sharing of benefits arising from their utilization.
- To identify any significant gaps in policies and legislation concerning aquatic genetic resources of farmed aquatic species and their wild relatives..

### Review of national policies and legislation for Aquatic Genetic Resources of farmed aquatic species and their wild relatives within national jurisdiction

32. Please list national legislation, policies and/or mechanisms that address aquatic genetic resources of farmed species and their wild relatives (see question 47 regarding international agreements).

Add Row

National legislation, policy and/or mechanism	Date established	Scope <i>Select all that apply</i>	Comments <i>Please provide any additional information for example whether it has been effective or not; and main sources of information</i>	
Genetically Modified Organism Act	Jan 1, 1997	<input checked="" type="checkbox"/> Genes or molecules only <input checked="" type="checkbox"/> Aquaculture <input type="checkbox"/> Capture fisheries <input checked="" type="checkbox"/> Conservation <input type="checkbox"/> Intellectual property protection <input checked="" type="checkbox"/> Importation <input checked="" type="checkbox"/> Trade and commerce <input type="checkbox"/> Access and benefit sharing <input type="checkbox"/> Other		X
MArine Living Resource Act	Jan 1, 1998	<input type="checkbox"/> Genes or molecules only <input checked="" type="checkbox"/> Aquaculture <input checked="" type="checkbox"/> Capture fisheries <input checked="" type="checkbox"/> Conservation <input type="checkbox"/> Intellectual property protection <input checked="" type="checkbox"/> Importation <input checked="" type="checkbox"/> Trade and commerce <input checked="" type="checkbox"/> Access and benefit sharing <input type="checkbox"/> Other	The MLRA conservation theme which has ensured that use of any wild stock and potential impact on wild stock by aquaculture is carefully considered and assessed. Collection of wild caught broodstock is carefully monitored to ensure stock is not impacted.	X

National legislation, policy and/or mechanism	Date established	Scope <i>Select all that apply</i>	Comments <i>Please provide any additional information for example whether it has been effective or not; and main sources of information</i>	
Threatened and Protected Species Act	Jan 1, 2004	<input type="checkbox"/> Genes or molecules only <input checked="" type="checkbox"/> Aquaculture <input type="checkbox"/> Capture fisheries <input checked="" type="checkbox"/> Conservation <input type="checkbox"/> Intellectual property protection <input checked="" type="checkbox"/> Importation <input checked="" type="checkbox"/> Trade and commerce <input checked="" type="checkbox"/> Access and benefit sharing <input type="checkbox"/> Other	The development of the regulations has been a lengthy process, the impact in terms of aquatic resources may be limited to date.	X
National Environmental Management Act: Biodiversity	Jan 1, 2004	<input type="checkbox"/> Genes or molecules only <input checked="" type="checkbox"/> Aquaculture <input checked="" type="checkbox"/> Capture fisheries <input checked="" type="checkbox"/> Conservation <input type="checkbox"/> Intellectual property protection <input checked="" type="checkbox"/> Importation <input type="checkbox"/> Trade and commerce <input type="checkbox"/> Access and benefit sharing <input type="checkbox"/> Other	The regulations in terms of listed alien and invasive species have been controversial and therefore slow in development. However, the act does require a risk assessment for the important of any alien species. It also regulated movement of extra limital species, especially in terms of the impact of alien tilapia species on local species	X

**Review of the current status and gaps in national policies and legislation for the conservation, sustainable use and development of aquatic genetic resources of farmed aquatic species and their wild relatives**

33. Please list any gaps in the coverage or constraints in implementing national legislation, policies and/or mechanisms in regard to aquatic genetic resources.

South Africa has extensive legislation in terms of conservation of various resources, including aquatic resources and has followed the precautionary approach in all management of aquaculture to date.

34. Please indicate any national aquatic genetic resources of farmed aquatic species and their wild relatives for which your country restricts access.

Type of genetic resource (can be species name, DNA, gametes or other descriptor)	Comments <i>Please, provide verifiable main sources of information, effectiveness of the restriction, description of type of restriction and for whom does the restriction apply</i>
DNA	
Stock, breed or variety	Haliotis Midae, agyrosomus japonicus,
Species	Oreochromis Niloticus, Crassostria Gigas, Lates calcarifer, turbot, various other alien species.
Other	
<b>Continue adding row as necessary</b>	
Add Row	Remove Row

35. Over the past 10 years, indicate the actions your country has taken to maintain or enhance access to aquatic genetic resources of farmed aquatic species and their wild relatives located outside your country; for example, by establishing germplasm acquisition agreements or material transfer agreements.

Add Row

Action taken to enhance access to aquatic genetic resources outside your country	Type of genetic resource <i>Mark all that apply</i>	Comment <i>for example other types of genetic resources</i>	
	<input type="checkbox"/> DNA <input type="checkbox"/> Genes <input type="checkbox"/> Gametes <input type="checkbox"/> Tissues <input type="checkbox"/> Embryos <input type="checkbox"/> Living specimens		X

36. Please indicate any obstacles your country has encountered when trying to access aquatic genetic resources of farmed aquatic species and their wild relatives outside of your country (including access for research purposes).

Obstacles to accessing aquatic genetic resources	Please describe type of genetic resource <i>mark all that apply</i>	Comments <i>please include additional information as needed</i>
Intellectual property protection	<input type="checkbox"/> DNA <input type="checkbox"/> Stock, breed or variety <input type="checkbox"/> Species <input type="checkbox"/> Other	
National laws of your country	<input type="checkbox"/> DNA <input checked="" type="checkbox"/> Stock, breed or variety <input checked="" type="checkbox"/> Species <input type="checkbox"/> Other	Biodiversity Act, import regulations, etc.
National laws of donor country	<input type="checkbox"/> DNA <input type="checkbox"/> Stock, breed or variety <input checked="" type="checkbox"/> Species <input type="checkbox"/> Other	
International laws or protocols	<input type="checkbox"/> DNA <input type="checkbox"/> Stock, breed or variety <input type="checkbox"/> Species <input type="checkbox"/> Other	
Too expensive	<input type="checkbox"/> DNA <input type="checkbox"/> Stock, breed or variety <input type="checkbox"/> Species <input type="checkbox"/> Other	
Material transfer agreements required	<input type="checkbox"/> DNA <input type="checkbox"/> Stock, breed or variety <input type="checkbox"/> Species <input type="checkbox"/> Other	
Knowledge gaps	<input type="checkbox"/> DNA <input type="checkbox"/> Stock, breed or variety <input type="checkbox"/> Species <input type="checkbox"/> Other	
Public perception	<input type="checkbox"/> DNA <input type="checkbox"/> Stock, breed or variety <input type="checkbox"/> Species <input type="checkbox"/> Other	

Obstacles to accessing aquatic genetic resources	Please describe type of genetic resource <i>mark all that apply</i>	Comments <i>please include additional information as needed</i>
Other	<input type="checkbox"/> DNA <input type="checkbox"/> Stock, breed or variety <input type="checkbox"/> Species <input type="checkbox"/> Other	
<b>Continue adding row as necessary</b>		
Add Row		

## Chapter 7: Research, Education, Training and Extension on Aquatic Genetic Resources within National Jurisdiction: Coordination, Networking and Information

The main objective of Chapter 7 is to review the status and adequacy of national research, education, training and extension, coordination and networking arrangements and information systems that support the conservation, sustainable use and development of aquatic genetic resources of farmed aquatic species and their wild relatives for food and agriculture.

The specific objectives are:

- To describe the current status, future plans, gaps, needs and priorities for research, training, extension and education on the conservation, sustainable use and development of aquatic genetic resources of farmed aquatic species and their wild relatives
- To describe existing or planned national networks for the conservation, sustainable use and development of aquatic genetic resources of farmed aquatic species and their wild relatives.
- To describe existing or planned information systems for the conservation, sustainable use and development of aquatic genetic resources of farmed aquatic species and their wild relatives.

### Research

37. Does your national research programme support the conservation, sustainable use and development of aquatic genetic resources of farmed aquatic species and their wild relatives? If yes, give details of current and/or planned research; if no, explain the main reasons why not in box below.

*Please mark appropriate box*

- Yes  
 No  
 Unknown

*Please provide details*

The National Department of Agriculture, Forestry and Fisheries is fully supportive of research aimed at the conservation, sustainable use and development of aquatic genetic resources of farmed aquatic species and their wild relatives. The Department either participates directly in such research or indirectly by collaborating with and providing financial support to institutions with the relevant expertise. Recent research undertaken by the Department in collaboration with Higher Educations Institutes, particularly with personnel from the Genetics Departments of the University of Stellenbosch and Pretoria, is focused on elucidating the population genetic structure of commercially important aquatic species, such as abalone (*Haliotis midae*), dusky kob (*Argyrosomus japonicus*), silver kob (*Argyrosomus inodorus*) and sea urchin (*Tripneustes gratilla*). Much of this research has focused on improving scientific knowledge of the distribution of genetic variation in both wild and hatchery stocks of these species so as to reduce the potential genetic impacts of farmed fish on wild populations and improve the management of broodstock and grow-out facilities. Genetic improvement of species such as trout, catfish, tilapia and abalone for commercial production is also being conducted by scientists from the University of Stellenbosch.

38. Please list main institutions, organizations, corporations and other entities in your country that are engaged in field and/or laboratory research related to the conservation, sustainable use and development of aquatic genetic resources of farmed aquatic species and their wild relatives.

Add Row

Main institutions, organizations, corporations and other entities	Area of research <i>Mark all that apply</i>	Comments <i>Please provide any additional information</i>	
South African National Department of Agriculture, Forestry & Fisheries (DAFF)	<input type="checkbox"/> Genetic resource management <input type="checkbox"/> Basic knowledge on aquatic genetic resources <input checked="" type="checkbox"/> Characterization and monitoring of aquatic genetic resources <input type="checkbox"/> Genetic improvement <input type="checkbox"/> Economic valuation of aquatic genetic resources <input checked="" type="checkbox"/> Conservation of aquatic genetic resources <input checked="" type="checkbox"/> Communication on aquatic genetic resources <input type="checkbox"/> Access and distribution of aquatic genetic resources <input type="checkbox"/> Other	Directly or indirectly involved the collection, generation and analysis of data to improve scientific knowledge of population genetic structure of commercially important aquatic species.	X
University of Stellenbosch	<input type="checkbox"/> Genetic resource management <input checked="" type="checkbox"/> Basic knowledge on aquatic genetic resources <input checked="" type="checkbox"/> Characterization and monitoring of aquatic genetic resources <input checked="" type="checkbox"/> Genetic improvement <input type="checkbox"/> Economic valuation of aquatic genetic resources <input type="checkbox"/> Conservation of aquatic genetic resources <input checked="" type="checkbox"/> Communication on aquatic genetic resources <input type="checkbox"/> Access and distribution of aquatic genetic resources <input type="checkbox"/> Other	This institution has a strong focus on aquaculture development in Southern Africa and presently conducts research to improve scientific knowledge of the distribution of genetic variation in both wild and hatchery stocks of several commercially important species and also conducts research on the genetic improvement of species such as trout, catfish, tilapia and abalone for commercial production.	X

Main institutions, organizations, corporations and other entities	Area of research <i>Mark all that apply</i>	Comments <i>Please provide any additional information</i>	
University of Pretoria	<input type="checkbox"/> Genetic resource management <input checked="" type="checkbox"/> Basic knowledge on aquatic genetic resources Characterization and <input type="checkbox"/> monitoring of aquatic genetic resources <input type="checkbox"/> Genetic improvement <input type="checkbox"/> Economic valuation of aquatic genetic resources <input type="checkbox"/> Conservation of aquatic genetic resources <input checked="" type="checkbox"/> Communication on aquatic genetic resources <input type="checkbox"/> Access and distribution of aquatic genetic resources <input type="checkbox"/> Other	Involved in a number of population genetics studies of commercially important aquaculture and wild fish species.	X
South African Institute of Aquatic Biodiversity	<input checked="" type="checkbox"/> Genetic resource management <input checked="" type="checkbox"/> Basic knowledge on aquatic genetic resources Characterization and <input checked="" type="checkbox"/> monitoring of aquatic genetic resources <input type="checkbox"/> Genetic improvement <input type="checkbox"/> Economic valuation of aquatic genetic resources <input type="checkbox"/> Conservation of aquatic genetic resources <input type="checkbox"/> Communication on aquatic genetic resources <input type="checkbox"/> Access and distribution of aquatic genetic resources <input type="checkbox"/> Other		X

39. What capacity strengthening is needed to improve national research in support of the conservation, sustainable use and development of aquatic genetic resources of farmed aquatic species and their wild relatives?

*Please rank the following in regard to capacity strengthening.*

Capacities	Rank 1=Very Important 10=No importance
Improve basic knowledge on aquatic genetic resources	3
Improve capacities for characterization and monitoring of aquatic genetic resources	3
Improve capacities for genetic improvement	1
Improve capacities for genetic resource management	2
Improve capacities for economic valuation of aquatic genetic resources	3
Improve capacities for conservation of aquatic genetic resources	3
Improve communication on aquatic genetic resources	5
Improve access to and distribution of aquatic genetic resources	5
Add other rows as appropriate and rank	
Add Row	Remove Row

*Please describe any other capacity building needs in regards to aquatic genetic resources*

**Education, training and extension**

40. Please indicate the extent that education, training and extension in your country covers the conservation, sustainable use and development of aquatic genetic resources of farmed aquatic species and their wild relatives? List the main institutions involved and the types of courses offered.

Add Row

Institution	Thematic Area	Type of courses mark all that apply	Comments	
University of Stellenbosch	Genetic resource management	<input checked="" type="checkbox"/> Undergraduate <input checked="" type="checkbox"/> Post-graduate <input checked="" type="checkbox"/> Training <input checked="" type="checkbox"/> Extension		
	Characterization and monitoring of aquatic genetic resources	<input type="checkbox"/> Undergraduate <input checked="" type="checkbox"/> Post-graduate <input checked="" type="checkbox"/> Training <input checked="" type="checkbox"/> Extension		
	Genetic improvement	<input type="checkbox"/> Undergraduate <input checked="" type="checkbox"/> Post-graduate <input checked="" type="checkbox"/> Training <input checked="" type="checkbox"/> Extension		X
	Economic valuation of aquatic genetic resources	<input type="checkbox"/> Undergraduate <input checked="" type="checkbox"/> Post-graduate <input checked="" type="checkbox"/> Training <input type="checkbox"/> Extension		
	Conservation of aquatic genetic resources	<input type="checkbox"/> Undergraduate <input checked="" type="checkbox"/> Post-graduate <input checked="" type="checkbox"/> Training <input checked="" type="checkbox"/> Extension		

University of Pretoria	Genetic resource management	<input type="checkbox"/> Undergraduate <input checked="" type="checkbox"/> Post-graduate <input checked="" type="checkbox"/> Training <input type="checkbox"/> Extension		
	Characterization and monitoring of aquatic genetic resources	<input type="checkbox"/> Undergraduate <input checked="" type="checkbox"/> Post-graduate <input checked="" type="checkbox"/> Training <input type="checkbox"/> Extension		
	Genetic improvement	<input type="checkbox"/> Undergraduate <input type="checkbox"/> Post-graduate <input type="checkbox"/> Training <input type="checkbox"/> Extension		X
	Economic valuation of aquatic genetic resources	<input type="checkbox"/> Undergraduate <input type="checkbox"/> Post-graduate <input type="checkbox"/> Training <input type="checkbox"/> Extension		
	Conservation of aquatic genetic resources	<input type="checkbox"/> Undergraduate <input checked="" type="checkbox"/> Post-graduate <input checked="" type="checkbox"/> Training <input type="checkbox"/> Extension		
South African Institute of Aquatic Biodiversity	Genetic resource management	<input type="checkbox"/> Undergraduate <input checked="" type="checkbox"/> Post-graduate <input checked="" type="checkbox"/> Training <input checked="" type="checkbox"/> Extension		
	Characterization and monitoring of aquatic genetic resources	<input type="checkbox"/> Undergraduate <input checked="" type="checkbox"/> Post-graduate <input checked="" type="checkbox"/> Training <input type="checkbox"/> Extension		
	Genetic improvement	<input type="checkbox"/> Undergraduate <input type="checkbox"/> Post-graduate <input type="checkbox"/> Training <input type="checkbox"/> Extension		X
	Economic valuation of aquatic genetic resources	<input type="checkbox"/> Undergraduate <input type="checkbox"/> Post-graduate <input type="checkbox"/> Training <input type="checkbox"/> Extension		
	Conservation of aquatic genetic resources	<input type="checkbox"/> Undergraduate <input checked="" type="checkbox"/> Post-graduate <input checked="" type="checkbox"/> Training <input type="checkbox"/> Extension		

Department of Agriculture, Forestry & Fisheries	Genetic resource management	<input type="checkbox"/> Undergraduate <input type="checkbox"/> Post-graduate <input type="checkbox"/> Training <input checked="" type="checkbox"/> Extension		
	Characterization and monitoring of aquatic genetic resources	<input type="checkbox"/> Undergraduate <input type="checkbox"/> Post-graduate <input type="checkbox"/> Training <input checked="" type="checkbox"/> Extension		
	Genetic improvement	<input type="checkbox"/> Undergraduate <input type="checkbox"/> Post-graduate <input type="checkbox"/> Training <input type="checkbox"/> Extension		X
	Economic valuation of aquatic genetic resources	<input type="checkbox"/> Undergraduate <input type="checkbox"/> Post-graduate <input type="checkbox"/> Training <input type="checkbox"/> Extension		
	Conservation of aquatic genetic resources	<input type="checkbox"/> Undergraduate <input type="checkbox"/> Post-graduate <input type="checkbox"/> Training <input checked="" type="checkbox"/> Extension		

**Coordination and networking**

41. Please list any mechanisms within your country responsible for coordinating the aquaculture, culture-based fisheries and capture fisheries subsectors with the other sectors that use watersheds and coastal ecosystems and have impacts on aquatic genetic resources of wild relatives of farmed aquatic species (e.g., agriculture, forestry, mining, tourism, waste management and water resources).

If no mechanism exists check here:

Add Row		
Name of mechanism	Description of how mechanism operates	
National Aquaculture Strategic Framework	Coordinate and fund research between industry, government, higher education institutes and other relevant stakeholders.	X

42. Please indicate how capacity strengthening can be improved in intersectoral coordination in support of the conservation, sustainable use and development of aquatic genetic resources.

*Please rank the following in regards to capacity strengthening.*

Capacities	Rank 1=Very Important 10=No importance
Increase awareness in institutions	3
Increase technical capacities of institutions	1
Increase information sharing between institutions	3
Add other rows as appropriate and rank <div data-bbox="211 779 833 936" style="border: 1px solid black; height: 75px; width: 100%;"></div> <div data-bbox="211 936 833 968" style="display: flex; justify-content: space-between; border: 1px solid black; padding: 2px;"> <span>Add Row</span> <span>Remove Row</span> </div>	<div data-bbox="990 810 1232 863" style="border: 1px solid black; height: 25px; width: 100%;"></div>

*Please specify in box below*

43. Please list any national networks in your country or any international networks your country belongs to that support the conservation, sustainable use and development of aquatic genetic resources.

Add Row

Network	Objectives of the network <i>Please mark all that apply</i> to your country	Comments	
	<input type="checkbox"/> Improve basic knowledge on aquatic genetic resources <input type="checkbox"/> Improve capacities for characterization and monitoring of aquatic genetic resources <input type="checkbox"/> Improve capacities for genetic improvement <input type="checkbox"/> Improve capacities for economic valuation of aquatic genetic resources <input type="checkbox"/> Improve capacities for conservation of aquatic genetic resources <input type="checkbox"/> Improve communication on aquatic genetic resources <input type="checkbox"/> Improve access to and distribution of aquatic genetic resources		X

### Information systems

44. Please list any information systems existing in your country for receiving, managing and communicating information about the conservation, sustainable use and development of aquatic genetic resources of farmed aquatic species and their wild relatives.

Add Row

Name of information system	Type of information stored <i>mark all that apply</i>	Main stakeholders <i>mark all that apply</i>	
<p>No formal system currently exists, although the DAFF, Directorate of Sustainable Aquaculture Management does play a minor role in this regard</p>	<input type="checkbox"/> DNA sequence <input type="checkbox"/> Genes and genotype <input type="checkbox"/> Breeds, strains or stocks <input type="checkbox"/> Species names <input type="checkbox"/> Production figures <input type="checkbox"/> Distribution <input type="checkbox"/> Level of endangerment <input type="checkbox"/> Other	<input type="checkbox"/> Fish farmers <input type="checkbox"/> Fishers in capture fisheries <input type="checkbox"/> Fish hatchery people <input type="checkbox"/> People involved in marketing <input type="checkbox"/> Government resource managers <input type="checkbox"/> Fishing or aquaculture associations <input type="checkbox"/> Aquatic protected area managers <input type="checkbox"/> University and academic people <input type="checkbox"/> Non-Governmental Organizations <input type="checkbox"/> Intergovernmental Organizations <input type="checkbox"/> Policy makers <input type="checkbox"/> Donors <input type="checkbox"/> Consumers <input type="checkbox"/> Politicians <p><b>Please list other stakeholders as necessary</b></p> <div style="border: 1px solid black; height: 40px; width: 100%;"></div>	X

45. What capacity strengthening is needed to improve national information systems to support the conservation, sustainable use and development of aquatic genetic resources?

*Please describe what capacities need to be strengthened*

*Please describe any other capacity building needs in regards to information systems for aquatic genetic resources*

## Chapter 8: International Collaboration on Aquatic Genetic Resources of Farmed Aquatic Species and Their Wild Relatives

The main objective of Chapter 8 is to review the mechanisms and instruments through which your country participates in international collaborations on aquatic genetic resources of farmed aquatic species and their wild relatives.

The specific objectives are:

- To identify your country's current participation in bilateral, sub-regional, regional, other international and global forms of collaboration on aquatic genetic resources. List national memberships, status as a Party and other forms of affiliation in agreements, conventions, treaties, international organizations, international networks and international programmes.
- To identify any other forms of international collaboration on aquatic genetic resources.
- To review the benefits from existing forms of international collaboration on aquatic genetic resources.
- To identify needs and priorities for future international collaboration on aquatic genetic resources

International collaboration includes bilateral arrangements and the sharing of particular waters and stocks of wild relatives of farmed aquatic species.

### International, regional or sub-regional agreements, conventions and treaties concerning aquatic genetic resources of farmed aquatic species and their wild relatives

46. Please list the international, regional or sub-regional agreements your country subscribes to that cover aquatic genetic resources of farmed species and their wild relatives, such as the Nagoya Protocol<sup>2</sup> the Convention on Biological Diversity and the Cartagena Protocol and how they have impacted aquatic genetic resources and stakeholders in your country. Examples could include:

<sup>2</sup> <http://www.cbd.int/abs/nagoya-protocol/signatories/>

- Establishment and management of shared or networked aquatic protected areas as far as wild relatives of farmed aquatic species are concerned
- Aquaculture and culture-based fisheries in transboundary or shared water bodies
- Sharing aquatic genetic material and related information
- Fishing rights, seasons and quotas as far as wild relatives of farmed aquatic species are concerned
- Conservation and sustainable use of shared water bodies and watercourses as far as wild relatives of farmed aquatic species are concerned
- Quarantine procedures for aquatic organisms and for control and notification of aquatic diseases

Add Row

International, Regional, bilateral or Sub-Regional agreement	Year your country ratified or subscribed to the agreement	Impact on aquatic genetic resources	Impact on stakeholders	Comments

International, Regional, bilateral or Sub-Regional agreement	Year your country ratified or subscribed to the agreement	Impact on aquatic genetic resources	Impact on stakeholders	Comments	
memorandum of cooperation signed between South Africa and China	2015	<input type="radio"/> Strongly positive <input checked="" type="radio"/> Positive <input type="radio"/> Negative <input type="radio"/> Strongly negative <input type="radio"/> No effect	<input type="radio"/> Strongly positive <input checked="" type="radio"/> Positive <input type="radio"/> Negative <input type="radio"/> Strongly negative <input type="radio"/> No effect	this memorandum of cooperation is still in the early stages of development. and will play a significant role on aquatic genetic resources in the proposed centres of excellence which have been proposed. the Gariiep Centre of excellence has been established and currently in operation.	X
Convention on International Trade in Endangered Species	1975	<input type="radio"/> Strongly positive <input checked="" type="radio"/> Positive <input type="radio"/> Negative <input type="radio"/> Strongly negative <input type="radio"/> No effect	<input type="radio"/> Strongly positive <input checked="" type="radio"/> Positive <input type="radio"/> Negative <input type="radio"/> Strongly negative <input type="radio"/> No effect	some of the farmed aquatic organisms have been added to the CITIES listing, for example abalone	X

47. Please list the priority needs regarding collaboration on conservation and sustainable use of aquatic genetic resources of farmed aquatic species and their wild relatives. Are they being addressed, i.e. are there any critical gaps?

Collaboration is needed in order to ...	Rank 1=Very Important 10=No importance	To what extent are the needs being met	Comments <i>For example any critical gaps</i>
Improve information technology and database management	2	<input type="radio"/> To a great extent <input type="radio"/> To some extent <input type="radio"/> None <input checked="" type="radio"/> Unknown	a comprehensive database is required,
Improve basic knowledge on aquatic genetic resources	2	<input type="radio"/> To a great extent <input checked="" type="radio"/> To some extent <input type="radio"/> None <input type="radio"/> Unknown	a large amount of research is taking place which needs to be fed into management strategies
Improve capacities for characterization and monitoring of aquatic genetic resources	1	<input type="radio"/> To a great extent <input type="radio"/> To some extent <input type="radio"/> None <input checked="" type="radio"/> Unknown	this is important for farmed animals as well as wild relatives
Improve capacities for genetic improvement	2	<input type="radio"/> To a great extent <input type="radio"/> To some extent <input type="radio"/> None <input checked="" type="radio"/> Unknown	required to improve the quality and growth rate of farmed organisms
Improve capacities for economic valuation of aquatic genetic resources	2	<input type="radio"/> To a great extent <input type="radio"/> To some extent <input type="radio"/> None <input checked="" type="radio"/> Unknown	
Improve capacities for conservation of aquatic genetic resources	2	<input type="radio"/> To a great extent <input checked="" type="radio"/> To some extent <input type="radio"/> None <input type="radio"/> Unknown	there is currently conservation legislation already in place in South Africa, with more in progress of being implemented.
Improve communication on aquatic genetic resources	3	<input type="radio"/> To a great extent <input checked="" type="radio"/> To some extent <input type="radio"/> None <input type="radio"/> Unknown	

Collaboration is needed in order to ...	Rank 1=Very Important 10=No importance	To what extent are the needs being met	Comments <i>For example any critical gaps</i>
To improve access to and distribution of aquatic genetic resources	3	<input type="radio"/> To a great extent <input type="radio"/> To some extent <input type="radio"/> None <input checked="" type="radio"/> Unknown	
Other		<input type="radio"/> To a great extent <input type="radio"/> To some extent <input type="radio"/> None <input type="radio"/> Unknown	
<b>Continue adding row as necessary</b>		<input type="radio"/> To a great extent <input type="radio"/> To some extent <input type="radio"/> None <input type="radio"/> Unknown	
		<input type="radio"/> To a great extent <input type="radio"/> To some extent <input type="radio"/> None <input type="radio"/> Unknown	
Add Row	Remove Row		

48. Please describe the types of collaboration that have been most beneficial for your country, and why?

Sweden, Norway and China - the South African aquaculture industry is still in its infancy, these countries have assisted South Africa in various training courses both abroad and locally. The Chinese collaboration has resulted in the construction of a freshwater centre of excellence focusing on Tilapia production. China has also sent research scientists to assist South Africa in various aspects of Aquaculture.

49. Is there a need for your country to expand its collaboration concerning the conservation, sustainable use and development of aquatic genetic resources? If yes, give details, including any requirements for capacity strengthening in box below

Yes

No

***If yes, please give details***

The Aquaculture industry is in its early stages of development, as it grows it will need to expand its collaboration concerning the conservation, sustainable use and development of aquatic genetic resources. Capacity will be required in terms of staff, technology, funding and training.

50. Describe important roles that your country performs within its region (and/or sub-region) and globally in terms of being a keeper, user and sharer of aquatic genetic resources.

unknown

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