Food and Agriculture Organization of the United Nations

COUNTRY REPORTS

Tanzania

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

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; Matthias.Halwart@fao.org; and 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; Matthias.Halwart@fao.org; and 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; Matthias.Halwart@fao.org; 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, Aquamaps, Barcode of Life, Census of Marine Life, FishBase, Frozen Ark, GenBank, Global Biodiversity Information Facility, International Union for Conservation of Nature, National Institutes of Health Database on Genomes and Bioinformatics, Ornamental Fish International, SealifeBase, Sea Around Us, and World Register of Marine Species.

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 31st 2015.**

www.algaebase.org
www.aquamaps.org
www.barcodeoflife.org
www.coml.org
www.fishbase.org
www.frozenark.org
www.genbank.org
www.gbif.org
www.iucn.org
http://discover.nci.nih.gov/
www.ornamental-fish-int.org
www.sealifebase.org
www.seaaroundus.org
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) immediatly.
- 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	United Republic of Tanzania
Prepared By	Dr. Hamisi L. Nikuli
Date	Jun 22, 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.

Africa is home to a world of diverse Animal Genetic Resources displaying a vast range of Darwinian adaptations that continually evolve due to the ever-changing ecosystems. These Animal Genetic Resources (AnGR) for food and agriculture are essential for Africa's food security, and contribute to the livelihoods of millions of people within and without the continent. It is critical that these resources are effectively managed by improving their conservation, sustainable use and development of aquatic genetic resources for food and agriculture, at national and regional levels. It is also important that, existing 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 identified.

However, Tanzania is currently thrives to review national policies and legislation; deal with research and development on management and conservation of aquatic genetic resources; and promote education, training and extension services on the conservation, sustainable use and development of aquatic genetic resources for food and agriculture. Through the use of aquaculture and fishers associations and private sector create awareness to the public about the importance of aquatic genetic resources for food and agriculture.

Although aquaculture is a growing industry in Tanzania, the main sources of broodstocks for farming are from wild and it has been realized that the performance of available species are generally poor which requires scientific proof on the factors contributing to the poor performance. Also, the country has realized obvious gaps that exist interms of conservation and management of Aquatic Genetic resources including inventory, characterization, monitoring and management of these resources.

Characterization, surveying and monitoring have remained key elements in the development of effective AqGR management plans and emphasis should be placed on certifying that these critical processes are well executed. Knowledge on population trends and genetic status of aquatic animal populations informs breeding strategies, conservation programs and policy-making processes. This information is vital at local, national, regional and global levels.

The evident gap in relation to the availability of relevant and reliable data on population status and trends of country AqGR has consequently resulted to misinformed decisions and poor management of these resources within the country. The use of molecular tools for characterization is limited in mainly due to lack of technical skills and availability of the biotechnology equipment.

Evidently, poor utilization of characterization, inventory and monitoring tools has contributed largely to this present situation. The ever-present challenges faced by users within the African continent need re-address. Tanzania recommend that, in order aquaculture develop and make a strong contribution to food security, there is an urgent need to seek sustainable solutions that will ultimately promote the improved utilization, conservation and managing these resources through promoting the availability and use of the tools within the country in the process of undertaking inventory and characterization of available Aquatic Genetic Resources (AqGR).

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

The United Republic of Tanzania is located in Eastern Africa. It is bordered by Kenya and Uganda to the North, Rwanda, Burundi and the Democratic Republic of Congo to the West and Zambia, Malawi and Mozambique to the South. The country's eastern border lies in the Indian Ocean which has a coastline of 1,424 km.

Zanzibar is a part of the United Republic of Tanzania and consists of two main islands of Unguja and Pemba and a number of small islands. The Islands are located 40 km off the mainland coast of East Africa in the Indian Ocean. The two main islands are 40 kilometers apart, separated by 700 meters deep Pemba Channel.

Tanzania has a total area is 945,087 sq.km including 61,000 sq. km of inland water and coastal stretch of 1,424 Kms. The total surface area of Zanzibar is 2,654 sq. Km. Unguja, the larger of the two islands has an area of 1,666 sq.km, while Pemba has an area of 988 sq.km.

The 2012 Population and Housing Census for the United Republic of Tanzania were carried out on the 26th August, 2012, Tanzania has a population of 44,928,923 of which 43,625,354 is on Tanzania Mainland and 1,303,569 is in Tanzania Zanzibar.

Tanzania is a developing country and its economy depends heavily on agriculture. The sector accounts for more than 40% of GDP, provides 85% of the country's exports and employs 80% of the total workforce. The fisheries sector contributed to 2.4 percent of the total Gross Domestic Product (GDP) in 2014 with a total fish production of 365,974 in year 2014 (Source: NBS 2010, National Accounts: 1999-2009, and Economic Survey, 2012).

The Fishery Sector in Tanzania is mostly made up of a freshwater fishery (86%) and a smaller, marine sector (14%). The catch trend data is currently averaging a yield of 350,000 t/yr freshwater fish and 50,000 t/yr marine, a total of over 400,000 t/yr in 2014. Of this, aquaculture contributed between 3-8,000t/yr (1-2%) which is significant low contribution. Therefore this trend of capture fisheries production alarms that capture fish supply is become limited in scope to meet per capita demand.

The available fish per capita consumption in Tanzania is nearly 50% of the FAO recommend average of 17kg/capita/yr as the ideal to achieve a balanced nutrition.

Between 1970s-80s, numerous aquaculture support and development projects took place, but by the 1990s, Shoko et al (2013) report that these efforts had not yielded significant results. There are several impediments to development of aquaculture. Among many of these impediments are inadequate quality and quantity of seed and Inadequate extension services, experienced and qualified staff.

Tanzanian aquaculture is based mainly on monoculture of Nile tilapia, Rainbow trout, African catfish (fresh water species) and milk fish and prawns (mariculture). Fish seed for aquaculture are obtained from wild fish and hatcheries (rivers, lakes and natural water reservoirs-dams).

There has been a steady increase in fish seed production from the 2012 which attributed by participation of private sector in the fish seeds production. There are 7 hatcheries, producing about 10 million fry annually where as the annual requirement is 50 million fingerlings. Of the seven 4 are private fish hatcheries and 3 are Government owned hatcheries.

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.

Species are known
But subspecies, hybrids, crossbreeds, strains, triploids and others are not known

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.

Genotypes are available at research scale

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, but fingerlings are produced in hatcheries

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** 15
- Percent managed by private sector**.** **Please Enter Percentage Here** 80
- Percent managed by private /public partnership. **Please Enter Percentage Here** 5

Total 100

Please add any explanation here.

These figures are based on number of hatcheries only, but not actual structured genetic improvement programs

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 *mark all that apply*	Developed By *mark all that apply*	
Oreochromis niloticus	☒ Traditional selective breeding	☒ Private Sector ☒ Public Sector ☒ Private/Public partnership	X
	☐ Hybrids	☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	
	☐ Triploids and other polyploids	☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	
	☒ Mono-sex production	☒ Private Sector ☒ Public Sector ☒ Private/Public partnership	
	☐ Other	☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	
Clarias gariepinus	☒ Traditional selective breeding	☒ Private Sector ☒ Public Sector ☒ Private/Public partnership	X
	☐ Hybrids	☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	
	☐ Triploids and other polyploids	☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	
	☐ Mono-sex production	☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	
	☐ Other	☐ Private Sector ☐ Public Sector ☐ Private/Public partnership	

9. Please fill in table 1.1

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

Add Row

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	*Indicate all genetic types that apply to the species*	Are genetic data available for farmed populations? If yes, give summary details in comments	Over the last 10 years, production has been ***(mark one)***	Expected trend over the next 10 years is that production will ***(mark one)***	Which genetic technologies are currently being used on the species ***(mark all that apply)***	***mark all that apply***	For example important traits improved, how data are used in management or name of breed, source of information, etc.	
◉ Native ○ Introduced Oreochromis niloticus	☒ Wild Type ☒ Selective bred type ☐ Hybrids ☐ Cross breeds ☒ Strains ☐ Varieties ☐ Polyploids	◉ Yes ○ No ○ Not Known	◉ Increasing ○ Stable ○ Fluctuating ○ Decreasing ○ Stopped ○ Not known	◉ Increasing ○ Stable ○ Fluctuating ○ Decreasing ○ Stopped ○ Not known	☒ Selective breeding ☐ Hybridization ☐ Polyploidy (chromosome set manipulation) ☒ Monosex ☐ Marker assisted selection ☐ Other (specify in comment)	☒ Selective breeding ☐ Hybridization ☐ Polyploidy (chromosome set manipulation) ☒ Monosex ☒ Marker assisted selection ☐ Other (specify in comment)	Genetic data are available but limited within research institutions and in some hatcheries example: 1. Growth performance of Oreochromis niloticus as factor of genes: 2. Stocking density of O. niloticus (to identify species tolerance to stress) 3. Reproductive biology of female O. niloticus to determine age at first maturity and fecundity.	X

◉ Native ○ Introduced Clarias gariepinus	☒ Wild Type ☒ Selective bred type ☐ Hybrids ☐ Cross breeds ☒ Strains ☐ Varieties ☐ Polyploids	◉ Yes ○ No ○ Not Known	◉ Increasing ○ Stable ○ Fluctuating ○ Decreasing ○ Stopped ○ Not known	◉ Increasing ○ Stable ○ Fluctuating ○ Decreasing ○ Stopped ○ Not known	☒ Selective breeding ☐ Hybridization ☐ Polyploidy (chromosome set manipulation) ☐ Monosex ☐ Marker assisted selection ☐ Other (specify in comment)	☒ Selective breeding ☐ Hybridization ☐ Polyploidy (chromosome set manipulation) ☐ Monosex ☒ Marker assisted selection ☐ Other (specify in comment)	Genetic data available but limited at research Institutions. These are: 1. Production of catfish fingerlings using artificial propagation for poverty reduction; 2. Effects of days to exogenous feeding on growth performance; 3. Practical feeding formulation and growth performance	X
◉ Native ○ Introduced Scylla serrata	☒ Wild Type ☐ Selective bred type ☐ Hybrids ☐ Cross breeds ☐ Strains ☐ Varieties ☐ Polyploids	○ Yes ○ No ◉ Not Known	◉ Increasing ○ Stable ○ Fluctuating ○ Decreasing ○ Stopped ○ Not known	◉ Increasing ○ Stable ○ Fluctuating ○ Decreasing ○ Stopped ○ Not known	☒ Selective breeding ☐ Hybridization ☐ Polyploidy (chromosome set manipulation) ☐ Monosex ☐ Marker assisted selection ☐ Other (specify in comment)	☒ Selective breeding ☐ Hybridization ☐ Polyploidy (chromosome set manipulation) ☐ Monosex ☐ Marker assisted selection ☐ Other (specify in comment)	Not known if genetic information are available	X

◉ Native ○ Introduced Penaeus monodon	☒ Wild Type ☒ Selective bred type ☐ Hybrids ☐ Cross breeds ☐ Strains ☐ Varieties ☐ Polyploids	○ Yes ○ No ◉ Not Known	◉ Increasing ○ Stable ○ Fluctuating ○ Decreasing ○ Stopped ○ Not known	◉ Increasing ○ Stable ○ Fluctuating ○ Decreasing ○ Stopped ○ Not known	☒ Selective breeding ☐ Hybridization ☐ Polyploidy (chromosome set manipulation) ☐ Monosex ☐ Marker assisted selection ☐ Other (specify in comment)	☒ Selective breeding ☐ Hybridization ☐ Polyploidy (chromosome set manipulation) ☐ Monosex ☐ Marker assisted selection ☐ Other (specify in comment)	Genetic information availability is not known	X
◉ Native ○ Introduced Chanos chanos	☒ Wild Type ☐ Selective bred type ☐ Hybrids ☐ Cross breeds ☐ Strains ☐ Varieties ☐ Polyploids	○ Yes ○ No ◉ Not Known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Stopped ○ Not known	◉ Increasing ○ Stable ○ Fluctuating ○ Decreasing ○ Stopped ○ Not known	☒ Selective breeding ☐ Hybridization ☐ Polyploidy (chromosome set manipulation) ☐ Monosex ☐ Marker assisted selection ☐ Other (specify in comment)	☒ Selective breeding ☐ Hybridization ☐ Polyploidy (chromosome set manipulation) ☐ Monosex ☐ Marker assisted selection ☐ Other (specify in comment)	Data on nutritional studies and development of wild milk fish are available at research institution (Tanzania Fisheries Research Institute)	X

◉ Native ○ Introduced Oncorhynchus mykiss	☒ Wild Type ☐ Selective bred type ☐ Hybrids ☐ Cross breeds ☐ Strains ☐ Varieties ☐ Polyploids	○ Yes ○ No ◉ Not Known	○ Increasing ◉ Stable ○ Fluctuating ○ Decreasing ○ Stopped ○ Not known	◉ Increasing ○ Stable ○ Fluctuating ○ Decreasing ○ Stopped ○ Not known	☒ Selective breeding ☐ Hybridization ☐ Polyploidy (chromosome set manipulation) ☐ Monosex ☐ Marker assisted selection ☐ Other (specify in comment)	☒ Selective breeding ☒ Hybridization ☐ Polyploidy (chromosome set manipulation) ☐ Monosex ☐ Marker assisted selection ☐ Other (specify in comment)	National intention is to have hybrids (Expectations)	X
◉ Native ○ Introduced Eucheuma spp	☐ Wild Type ☒ Selective bred type ☐ Hybrids ☐ Cross breeds ☐ Strains ☒ Varieties ☐ Polyploids	◉ Yes ○ No ○ Not Known	○ Increasing ○ Stable ◉ Fluctuating ○ Decreasing ○ Stopped ○ Not known	○ Increasing ○ Stable ◉ Fluctuating ○ Decreasing ○ Stopped ○ Not known	☒ Selective breeding ☐ Hybridization ☐ Polyploidy (chromosome set manipulation) ☐ Monosex ☐ Marker assisted selection ☐ Other (specify in comment)	☒ Selective breeding ☐ Hybridization ☐ Polyploidy (chromosome set manipulation) ☐ Monosex ☐ Marker assisted selection ☐ Other (specify in comment)	Sea weed species were introduced in 1980s from Philippines but production per unit area has been decreasing annually. Climate change and gentic changes have been considered as causes.	X

◯ Native ◯ Introduced Pteria penguin	☒ Wild Type ☐ Selective bred type ☐ Hybrids ☐ Cross breeds ☐ Strains ☐ Varieties ☐ Polyploids	◯ Yes ◯ No ◉ Not Known	◉ Increasing ◯ Stable ◯ Fluctuating ◯ Decreasing ◯ Stopped ◯ Not known	◉ Increasing ◯ Stable ◯ Fluctuating ◯ Decreasing ◯ Stopped ◯ Not known	☒ Selective breeding ☐ Hybridization ☐ Polyploidy (chromosome set manipulation) ☐ Monosex ☐ Marker assisted selection ☐ Other (specify in comment)	☒ Selective breeding ☐ Hybridization ☐ Polyploidy (chromosome set manipulation) ☐ Monosex ☐ Marker assisted selection ☐ Other (specify in comment)		X

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

Add Row

Species ***Type and select a species***	Is the species native to your country?	Comments ***For example main sources of information***	
Siganus spp	(•) Yes ( ) No ( ) Not Known	This was pioneered by Prof. Phillip Bwathondi who had been doing scientific experiments on cage culture of Siganus sutor (rabbit fish) in 1978.	X
Mugil cephalus	(•) Yes ( ) No ( ) Not Known	This was pioneered by Prof. Phillip Bwathondi who had been doing scientific experiments on cage culture of Siganus sutor (rabbit fish) in 1978.	X
Pinctada margaritifera	(•) Yes ( ) No ( ) Not Known	This was pioneered by Prof. Phillip Bwathondi who had been doing scientific experiments on cage culture of Siganus sutor (rabbit fish) in 1978.	X

Anadara spp	(•) Yes ( ) No ( ) Not Known		X
Mytilus edulis	(•) Yes ( ) No ( ) Not Known		X
Artemia salina	(•) Yes ( ) No ( ) Not Known	No culture system to date has been introduced.	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 **Mark all that apply**	Details of transfer or exchange	Type of genetic material exchanged **Mark all that apply**	Country or countries involved with exchange **Hold CTRL button to select more than one country**	Comments ***Please add main purpose or objective of the exchange and main sources of information***	
Cyprichromis Leptosoma jumbo	☐ No deliberate genetic alteration ☒ Traditional selective breeding ☐ Hybrids ☐ Triploids and other polyploids ☐ Mono-sex production ☐ Other	☐ Import ☒ Export	☐ DNA ☐ Genes ☐ Gametes ☐ Tissues ☐ Embryos ☒ Living specimens ☐ Other	Nepal Netherlands New Zealand Nicaragua Niger Nigeria Niue Norway Oman Pakistan Palau Panama Papua New Guinea Paraguay Peru Philippines Poland	The available National Fisheries Act No. 22 of 2003 restricts importation of live aquatic animal species. However, Ornamental fish Cyprichromis leptsoma jumbo were exported to Hong Kong	X
Benthochromis tricoti	☐ No deliberate genetic alteration ☒ Traditional selective breeding ☐ Hybrids ☐ Triploids and other polyploids ☐ Mono-sex production ☐ Other	☐ Import ☒ Export	☐ DNA ☐ Genes ☐ Gametes ☐ Tissues ☐ Embryos ☒ Living specimens ☐ Other	Afghanistan Albania Algeria Andorra Angola Antigua and Barbuda Argentina Armenia Australia Austria Azerbaijan Bahamas Bahrain Bangladesh Barbados Belarus Belgium	Ornamental fish Benthochromis tricot were exported to Hong Kong	X

Tropheus kaiser	☐ No deliberate genetic alteration ☒ Traditional selective breeding ☐ Hybrids ☐ Triploids and other polyploids ☐ Mono-sex production ☐ Other	☐ Import ☒ Export	☐ DNA ☐ Genes ☐ Gametes ☐ Tissues ☐ Embryos ☒ Living specimens ☐ Other	Afghanistan Albania Algeria Andorra Angola Antigua and Barbuda Argentina Armenia Australia Austria Azerbaijan Bahamas Bahrain Bangladesh Barbados Belarus Belgium	Ornamental fish Tropheus kaiser ikola to Hong Kong	X
Cyprichromis microlepidotus	☐ No deliberate genetic alteration ☒ Traditional selective breeding ☐ Hybrids ☐ Triploids and other polyploids ☐ Mono-sex production ☐ Other	☐ Import ☒ Export	☐ DNA ☐ Genes ☐ Gametes ☐ Tissues ☐ Embryos ☒ Living specimens ☐ Other	Ecuador Egypt El Salvador Equatorial Guinea Eritrea Estonia Ethiopia European Union (Mer Faroe Islands (Associa Fiji Finland France Gabon Gambia Georgia Germany Ghana		X
Xenotilapia flavipinnis	☐ No deliberate genetic alteration ☒ Traditional selective breeding ☐ Hybrids ☐ Triploids and other polyploids ☐ Mono-sex production ☐ Other	☐ Import ☒ Export	☐ DNA ☐ Genes ☐ Gametes ☐ Tissues ☐ Embryos ☒ Living specimens ☐ Other	Ecuador Egypt El Salvador Equatorial Guinea Eritrea Estonia Ethiopia European Union (Mer Faroe Islands (Associa Fiji Finland France Gabon Gambia Georgia Germany Ghana	Ornamental fish X. flavipinis to Germany	X

E. kipili	☐ No deliberate genetic alteration ☒ Traditional selective breeding ☐ Hybrids ☐ Triploids and other polyploids ☐ Mono-sex production ☐ Other	☐ Import ☒ Export	☐ DNA ☐ Genes ☐ Gametes ☐ Tissues ☐ Embryos ☒ Living specimens ☐ Other	Ecuador Egypt El Salvador Equatorial Guinea Eritrea Estonia Ethiopia European Union (Mer Faroe Islands (Associa Fiji Finland France Gabon Gambia Georgia Germany Ghana	Ornamental fish Eret. kipili to Germany	X
Ctenopharyngodon idellus	☐ No deliberate genetic alteration ☒ Traditional selective breeding ☐ Hybrids ☐ Triploids and other polyploids ☐ Mono-sex production ☐ Other	☐ Import ☒ Export	☐ DNA ☐ Genes ☐ Gametes ☐ Tissues ☐ Embryos ☒ Living specimens ☐ Other	Ecuador Egypt El Salvador Equatorial Guinea Eritrea Estonia Ethiopia European Union (Mer Faroe Islands (Associa Fiji Finland France Gabon Gambia Georgia Germany Ghana		X
Tyrannochromis nigriventer	☐ No deliberate genetic alteration ☒ Traditional selective breeding ☐ Hybrids ☐ Triploids and other polyploids ☐ Mono-sex production ☐ Other	☐ Import ☒ Export	☐ DNA ☐ Genes ☐ Gametes ☐ Tissues ☐ Embryos ☒ Living specimens ☐ Other	Ecuador Egypt El Salvador Equatorial Guinea Eritrea Estonia Ethiopia European Union (Mer Faroe Islands (Associa Fiji Finland France Gabon Gambia Georgia Germany Ghana		X

Tropheus moorii Ikola kaiser	☐ No deliberate genetic alteration ☒ Traditional selective breeding ☐ Hybrids ☐ Triploids and other polyploids ☐ Mono-sex production ☐ Other	☐ Import ☒ Export	☐ DNA ☐ Genes ☐ Gametes ☐ Tissues ☐ Embryos ☒ Living specimens ☐ Other	Afghanistan Albania Algeria Andorra Angola Antigua and Barbuda Argentina Armenia Australia Austria Azerbaijan Bahamas Bahrain Bangladesh Barbados Belarus Belgium	Ornamental fish Tropheus moriilkola kaiser to South Korea	X
Compressisceps spp	☐ No deliberate genetic alteration ☒ Traditional selective breeding ☐ Hybrids ☐ Triploids and other polyploids ☐ Mono-sex production ☐ Other	☐ Import ☒ Export	☐ DNA ☐ Genes ☐ Gametes ☐ Tissues ☐ Embryos ☒ Living specimens ☐ Other	Afghanistan Albania Algeria Andorra Angola Antigua and Barbuda Argentina Armenia Australia Austria Azerbaijan Bahamas Bahrain Bangladesh Barbados Belarus Belgium	Ornamental fish Compressiscepsto South Korea	X
Metri black margin	☐ No deliberate genetic alteration ☒ Traditional selective breeding ☐ Hybrids ☐ Triploids and other polyploids ☐ Mono-sex production ☐ Other	☐ Import ☒ Export	☐ DNA ☐ Genes ☐ Gametes ☐ Tissues ☐ Embryos ☒ Living specimens ☐ Other	Denmark Djibouti Dominica Dominican Republic Ecuador Egypt El Salvador Equatorial Guinea Eritrea Estonia Ethiopia European Union (Mer Faroe Islands (Associa Fiji Finland France Gabon		X

Pseudotropheus msobo magunga	☐ No deliberate genetic alteration ☒ Traditional selective breeding ☐ Hybrids ☐ Triploids and other polyploids ☐ Mono-sex production ☐ Other	☐ Import ☒ Export	☐ DNA ☐ Genes ☐ Gametes ☐ Tissues ☐ Embryos ☒ Living specimens ☐ Other	Denmark Djibouti Dominica Dominican Republic Ecuador Egypt El Salvador Equatorial Guinea Eritrea Estonia Ethiopia European Union (Mer Faroe Islands (Associa Fiji Finland France Gabon		X
Pseudotropheus msobo chinula	☐ No deliberate genetic alteration ☒ Traditional selective breeding ☐ Hybrids ☐ Triploids and other polyploids ☐ Mono-sex production ☐ Other	☐ Import ☒ Export	☐ DNA ☐ Genes ☐ Gametes ☐ Tissues ☐ Embryos ☒ Living specimens ☐ Other	Denmark Djibouti Dominica Dominican Republic Ecuador Egypt El Salvador Equatorial Guinea Eritrea Estonia Ethiopia European Union (Mer Faroe Islands (Associa Fiji Finland France Gabon		X
Tropheus spp (red)	☐ No deliberate genetic alteration ☒ Traditional selective breeding ☐ Hybrids ☐ Triploids and other polyploids ☐ Mono-sex production ☐ Other	☐ Import ☒ Export	☐ DNA ☐ Genes ☐ Gametes ☐ Tissues ☐ Embryos ☒ Living specimens ☐ Other	Thailand Timor-Leste Togo Tokelau (Associate Me Tonga Trinidad and Tobago Tunisia Turkey Turkmenistan Tuvalu Uganda Ukraine United Arab Emirates United Kingdom United Republic of Ta United States of Amer 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.

Add Row

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.

Species	Use *(mark all that apply)*	Comments	
Benthochromis tricoti	☐ Capture fisheries ☐ Recreational fishery ☒ Aquaria ☐ Biological control ☐ Research and develpment ☐ Other (specify in comments)	They were all legally transferred	X
Cyprichromis microlepidotus	☐ Capture fisheries ☐ Recreational fishery ☒ Aquaria ☐ Biological control ☐ Research and develpment ☐ Other (specify in comments)		X
E. kipili	☐ Capture fisheries ☐ Recreational fishery ☒ Aquaria ☐ Biological control ☐ Research and develpment ☐ Other (specify in comments)		X

Ctenopharyngodon idellus	☐ Capture fisheries ☐ Recreational fishery ☒ Aquaria ☐ Biological control ☐ Research and develpment ☐ Other (specify in comments)		X
Tyrannochromis nigriventer	☐ Capture fisheries ☐ Recreational fishery ☒ Aquaria ☐ Biological control ☐ Research and develpment ☐ Other (specify in comments)		X
Compressisceps	☐ Capture fisheries ☐ Recreational fishery ☒ Aquaria ☐ Biological control ☐ Research and develpment ☐ Other (specify in comments)		X
Metri black margin	☐ Capture fisheries ☐ Recreational fishery ☒ Aquaria ☐ Biological control ☐ Research and develpment ☐ Other (specify in comments)		X

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 ***mark all that apply***	Type of genetic material exchanged	Country **Hold CTRL button to select more than one country**	Comments ***main sources of information, if the transfer was legal or not***	
Metri black margin	☐ Import ☒ Export	☐ Tissues ☐ Gametes ☐ DNA ☐ Genes ☐ Embryos ☒ Living specimens ☐ Other	Egypt El Salvador Equatorial Guinea Eritrea Estonia Ethiopia European Union (Member Faroe Islands (Associate M Fiji Finland France Gabon Gambia Georgia Germany Ghana	They are Ornamental fish and were legally transferred. Sources of information is The Ministry of Agriculture Livestock and Fisheries - Tanzania.	X
Compressisceps	☐ Import ☒ Export	☐ Tissues ☐ Gametes ☐ DNA ☐ Genes ☐ Embryos ☒ Living specimens ☐ Other	Afghanistan Albania Algeria Andorra Angola Antigua and Barbuda Argentina Armenia Australia Austria Azerbaijan Bahamas Bahrain Bangladesh Barbados Belarus	Exported to South Korea. They are Ornamental fish and were legally transferred. Sources of information is The Ministry of Agriculture Livestock and Fisheries - Tanzania	X
Tyrannochromis nigriventer	☐ Import ☒ Export	☐ Tissues ☐ Gametes ☐ DNA ☐ Genes ☐ Embryos ☒ Living specimens ☐ Other	Egypt El Salvador Equatorial Guinea Eritrea Estonia Ethiopia European Union (Member Faroe Islands (Associate M Fiji Finland France Gabon Gambia Georgia Germany Ghana	They are Ornamental fish and were legally transferred. Sources of information is The Ministry of Agriculture Livestock and Fisheries - Tanzania	X

Ctenopharyngodon idellus	☐ Import ☒ Export	☐ Tissues ☐ Gametes ☐ DNA ☐ Genes ☐ Embryos ☒ Living specimens ☐ Other	Egypt El Salvador Equatorial Guinea Eritrea Estonia Ethiopia European Union (Membei Faroe Islands (Associate M Fiji Finland France Gabon Gambia Georgia Germany Ghana	They are Ornamental fish and were legally transferred. Sources of information is The Ministry of Agriculture Livestock and Fisheries - Tanzania	X
E. kipili	☐ Import ☒ Export	☐ Tissues ☐ Gametes ☐ DNA ☐ Genes ☐ Embryos ☒ Living specimens ☐ Other	Egypt El Salvador Equatorial Guinea Eritrea Estonia Ethiopia European Union (Membei Faroe Islands (Associate M Fiji Finland France Gabon Gambia Georgia Germany Ghana	They are Ornamental fish and were legally transferred. Sources of information is The Ministry of Agriculture Livestock and Fisheries - Tanzania	X
Cyprichromis microlepidotus	☐ Import ☒ Export	☐ Tissues ☐ Gametes ☐ DNA ☐ Genes ☐ Embryos ☒ Living specimens ☐ Other	Egypt El Salvador Equatorial Guinea Eritrea Estonia Ethiopia European Union (Membei Faroe Islands (Associate M Fiji Finland France Gabon Gambia Georgia Germany Ghana	They are Ornamental fish and were legally transferred. Sources of information is The Ministry of Agriculture Livestock and Fisheries - Tanzania	X

14. Please fill in table 1.2

Table 1.2 Aquatic genetic resources of wild relatives of farmed aquatic species in your country.

Add Row

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	
For each row, list the species as scientific names (put in brackets the most widely used national common For each species, include the named stocks and name of other management units if known)	Is the species ***(mark as appropriate):***	Is this species targeted by capture fisheries?	Are there any management measures in place?	Are genetic data available for the fishery?	Are genetic data used in management?	Over the last 10 years, catches have been:	Expected trend over the next 10 years.	Indicate the ecosystem where the fishery is located (***mark all that apply)***	The habitat or range is	What are likely reasons for changes? (***mark all that apply)***	
Oreochromis niloticus	☐ Straddling ☒ Transboundary ☐ Introduced ☒ Native	◉ Yes ○ No ○ Not Known	◉ Yes ○ No ○ Not Known	◉ Yes ○ No ○ Not Known	○ Yes ◉ No ○ Not Known	○ Increasing ○ Stable ○ Fluctuating ◉ Decreasing ○ Depleted ○ Not known	○ Increasing ○ Stable ○ Fluctuating ◉ Decreasing ○ Depleted ○ Not known	☐ Intertital ☐ Coastal in EEZ ☐ High seas ☒ Lake ☒ Reservoir ☒ River ☒ Swamp ☐ Other **(specify)**	○ Increasing ○ Stable ◉ Decreasing ○ Not known	☒ Habitat ☒ Climate ☒ Invasive species ☒ Pollution ☐ Rehabilitation of habitat ☐ Others ☐ 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	
Clarias gariepinus	☐ Straddling ☒ Transboundary ☐ Introduced ☒ Native	◉ Yes ○ No ○ Not Known	◉ Yes ○ No ○ Not Known	◉ Yes ○ No ○ Not Known	○ Yes ◉ No ○ Not Known	○ Increasing ○ Stable ◉ Fluctuating ○ Decreasing ○ Depleted ○ Not known	○ Increasing ○ Stable ◉ Fluctuating ○ Decreasing ○ Depleted ○ Not known	☐ Intertital ☐ Coastal in EEZ ☐ High seas ☒ Lake ☒ Reservoir ☒ River ☒ Swamp ☐ Other **(specify)**	○ Increasing ◉ Stable ○ Decreasing ○ Not known	☒ Habitat ☒ Climate ☐ Invasive species ☐ Pollution ☐ Rehabilitation of habitat ☐ Others ☐ Not known	X
Chanos chanos	☐ Straddling ☒ Transboundary ☐ Introduced ☒ Native	◉ Yes ○ No ○ Not Known	◉ Yes ○ No ○ Not Known	○ Yes ○ No ◉ Not Known	○ Yes ○ No ◉ Not Known	○ Increasing ○ Stable ◉ Fluctuating ○ Decreasing ○ Depleted ○ Not known	○ Increasing ○ Stable ◉ Fluctuating ○ Decreasing ○ Depleted ○ Not known	☒ Intertital ☒ Coastal in EEZ ☐ High seas ☐ Lake ☐ Reservoir ☐ River ☐ Swamp ☐ Other **(specify)**	○ Increasing ◉ Stable ○ Decreasing ○ Not known	☒ Habitat ☒ Climate ☐ Invasive species ☐ Pollution ☐ Rehabilitation of habitat ☐ Others ☐ 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	
Penaeus monodon	☒ Straddling ☒ Transboundary ☐ Introduced ☒ Native	◉ Yes ○ No ○ Not Known	○ Yes ○ No ◉ Not Known	○ Yes ○ No ◉ Not Known	○ Yes ○ No ◉ Not Known	○ Increasing ○ Stable ◉ Fluctuating ○ Decreasing ○ Depleted ○ Not known	○ Increasing ○ Stable ◉ Fluctuating ○ Decreasing ○ Depleted ○ Not known	☒ Intertital ☒ Coastal in EEZ ☐ High seas ☐ Lake ☐ Reservoir ☐ River ☐ Swamp ☐ Other **(specify)**	○ Increasing ◉ Stable ○ Decreasing ○ Not known	☒ Habitat ☒ Climate ☐ Invasive species ☐ Pollution ☐ Rehabilitation of habitat ☐ Others ☒ Not known	X
Scylla serrata	☐ Straddling ☐ Transboundary ☐ Introduced ☒ Native	◉ Yes ○ No ○ Not Known	○ Yes ○ No ◉ Not Known	○ Yes ○ No ◉ Not Known	○ Yes ○ No ◉ Not Known	○ Increasing ○ Stable ◉ Fluctuating ○ Decreasing ○ Depleted ○ Not known	○ Increasing ○ Stable ◉ Fluctuating ○ Decreasing ○ Depleted ○ Not known	☒ Intertital ☐ Coastal in EEZ ☐ High seas ☐ Lake ☐ Reservoir ☐ River ☒ Swamp ☐ Other **(specify)**	○ Increasing ◉ Stable ○ Decreasing ○ Not known	☒ Habitat ☒ Climate ☐ Invasive species ☐ Pollution ☐ Rehabilitation of habitat ☐ Others ☒ 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	
Penaeus monodon	☒ Straddling ☒ Transboundary ☐ Introduced ☒ Native	◉ Yes ○ No ○ Not Known	○ Yes ○ No ◉ Not Known	○ Yes ○ No ◉ Not Known	○ Yes ○ No ◉ Not Known	○ Increasing ○ Stable ◉ Fluctuating ○ Decreasing ○ Depleted ○ Not known	○ Increasing ○ Stable ◉ Fluctuating ○ Decreasing ○ Depleted ○ Not known	☒ Intertital ☒ Coastal in EEZ ☐ High seas ☐ Lake ☐ Reservoir ☐ River ☐ Swamp ☐ Other **(specify)**	○ Increasing ◉ Stable ○ Decreasing ○ Not known	☒ Habitat ☒ Climate ☐ Invasive species ☐ Pollution ☐ Rehabilitation of habitat ☐ Others ☒ Not known	X
Scylla serrata	☐ Straddling ☐ Transboundary ☐ Introduced ☒ Native	◉ Yes ○ No ○ Not Known	○ Yes ○ No ◉ Not Known	○ Yes ○ No ◉ Not Known	○ Yes ○ No ◉ Not Known	○ Increasing ○ Stable ◉ Fluctuating ○ Decreasing ○ Depleted ○ Not known	○ Increasing ○ Stable ◉ Fluctuating ○ Decreasing ○ Depleted ○ Not known	☒ Intertital ☐ Coastal in EEZ ☐ High seas ☐ Lake ☐ Reservoir ☐ River ☒ Swamp ☐ Other **(specify)**	○ Increasing ◉ Stable ○ Decreasing ○ Not known	☒ Habitat ☒ Climate ☐ Invasive species ☐ Pollution ☐ Rehabilitation of habitat ☐ Others ☒ 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	
Eucheuma spp	☐ Straddling ☐ Transboundary ☒ Introduced ☐ Native	◯ Yes ◉ No ◯ Not Known	◉ Yes ◯ No ◯ Not Known	◯ Yes ◯ No ◉ Not Known	◯ Yes ◯ No ◉ Not Known	◯ Increasing ◯ Stable ◉ Fluctuating ◯ Decreasing ◯ Depleted ◯ Not known	◯ Increasing ◯ Stable ◉ Fluctuating ◯ Decreasing ◯ Depleted ◯ Not known	☒ Intertital ☐ Coastal in EEZ ☐ High seas ☐ Lake ☐ Reservoir ☐ River ☐ Swamp ☐ Other **(specify)**	◯ Increasing ◉ Stable ◯ Decreasing ◯ Not known	☒ Habitat ☒ Climate ☐ Invasive species ☐ Pollution ☐ Rehabilitation of habitat ☐ Others ☒ Not known	X
Oncorhynchus mykiss	☐ Straddling ☐ Transboundary ☒ Introduced ☒ Native	◯ Yes ◉ No ◯ Not Known	◯ Yes ◯ No ◉ Not Known	◯ Yes ◯ No ◉ Not Known	◯ Yes ◯ No ◉ Not Known	◯ Increasing ◯ Stable ◯ Fluctuating ◯ Decreasing ◯ Depleted ◉ Not known	◯ Increasing ◯ Stable ◯ Fluctuating ◯ Decreasing ◯ Depleted ◉ Not known	☐ Intertital ☐ Coastal in EEZ ☐ High seas ☐ Lake ☒ Reservoir ☒ River ☒ Swamp ☐ Other **(specify)**	◯ Increasing ◉ Stable ◯ Decreasing ◯ Not known	☐ Habitat ☐ Climate ☐ Invasive species ☐ Pollution ☐ Rehabilitation of habitat ☐ Others ☒ 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	
Pinctada margaritifera	☐ Straddling ☐ Transboundary ☐ Introduced ☒ Native	○ Yes ◉ No ○ Not Known	○ Yes ○ No ◉ Not Known	○ Yes ○ No ◉ Not Known	○ Yes ○ No ○ Not Known	◉ Increasing ○ Stable ○ Fluctuating ○ Decreasing ○ Depleted ○ Not known	◉ Increasing ○ Stable ○ Fluctuating ○ Decreasing ○ Depleted ○ Not known	☒ Intertital ☐ Coastal in EEZ ☐ High seas ☐ Lake ☐ Reservoir ☐ River ☐ Swamp ☐ Other **(specify)**	○ Increasing ○ Stable ○ Decreasing ○ Not known	☐ Habitat ☐ Climate ☐ Invasive species ☐ Pollution ☐ Rehabilitation of habitat ☐ Others ☐ 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 ***Mark appropriate box***	Comments ***List examples or other relevant information***
Human population increase	(●) Strongly positive ( ) Positive ( ) Negative ( ) Strongly negative ( ) No effect ( ) Unknown	Increase in human population has raised demand for fish and therefore, this inturn has promoted the increase in fingerlings production, Hatchery centres and use of monosex technologies.
Increased wealth and demand for fish	( ) Strongly positive (●) Positive ( ) Negative ( ) Strongly negative ( ) No effect ( ) Unknown	ncrease in human population has raised demand for fish and also preference to certain fish species example O. niloticus
Governance (ability of government, industry and the public to work together in managing resources)	(●) Strongly positive ( ) Positive ( ) Negative ( ) Strongly negative ( ) No effect ( ) Unknown	In Tanzania, The Ministry of Livestock and Fisheries Development is working together with other ministries (Environment) in protecting genetic resources and aquatic animal habitats.
Climate change	( ) Strongly positive ( ) Positive (●) Negative ( ) Strongly negative ( ) No effect ( ) Unknown	Some places climate change effects has caused raise in water levels (Floods) examples in hatchery centres. In this case floods caused displacement of the fish from the raising ponds into the wild.
Competition for resources, especially freshwater	( ) Strongly positive ( ) Positive ( ) Negative ( ) Strongly negative ( ) No effect (●) Unknown	Reports are restricted to the research institutions (if resources are depleting, constant or increasing)

Driver impacting aquaculture	Effect on AqGR ***Mark appropriate box***	Comments ***List examples or other relevant information***
Changes in values and ethics of consumers	○ Strongly positive ○ Positive ◉ Negative ○ Strongly negative ○ No effect ○ Unknown	Certain fish species example Oreochromis niloticus are more prefered than other fresh water farmed species therefore, they are more harvested and are liable to depletion.
Other ***Add other drivers as necessary*** Add Row Remove Row	○ Strongly positive ○ Positive ○ Negative ○ Strongly negative ○ No effect ○ Unknown	

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 ***Mark appropriate box***	Comments ***List examples or other relevant information***
Human population increase	◯ Strongly positive ◯ Positive ◉ Negative ◯ Strongly negative ◯ No effect ◯ Unknown	Increase in human population has raised demand for fish and therefore, this inturn has promoted over exploitation of fish in general
Increased wealth and demand for fish	◯ Strongly positive ◯ Positive ◉ Negative ◯ Strongly negative ◯ No effect ◯ Unknown	Increase in wealth has raised demand for fish and also preference to fish species
Governance (ability of government, industry and the public to work together in managing resources)	◉ Strongly positive ◯ Positive ◯ Negative ◯ Strongly negative ◯ No effect ◯ Unknown	In Tanzania, The Ministry of Livestock and Fisheries Development is working together with other ministries (example; Environment) in protecting genetic resources and aquatic animal habitats. This collaboration has positive impacts on protection of Genetic resources.
Climate change	◯ Strongly positive ◯ Positive ◉ Negative ◯ Strongly negative ◯ No effect ◯ Unknown	Some places climate change effects has caused raise in water levels (Floods) leading to displacement of certain fish species where they later die. Raising water temperatures as a result of climate change has caused mortality and displacement of fish.
Competition for resources, especially freshwater	◯ Strongly positive ◯ Positive ◯ Negative ◯ Strongly negative ◯ No effect ◉ Unknown	Reports are restricted to the research institutions (if resources are depleting, constant or increasing)

Driver impacting aquaculture	Effect on AqGR ***Mark appropriate box***	Comments ***List examples or other relevant information***
Changes in values and ethics of consumers	◯ Strongly positive ◯ Positive ◯ Negative ◯ Strongly negative ◯ No effect ◉ Unknown	Reports are restricted to the research institutions (if resources are depleting, constant or increasing)
Other ***Add other drivers as necessary*** Add Row / Remove Row	◯ Strongly positive ◯ Positive ◯ Negative ◯ Strongly negative ◯ No effect ◯ Unknown	

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

Law enforcement in:
1. There is a need to undertake inventory to let AqGR in the country are clearly known, There is a need Characterize them to have known pure strains and breeds and also need for monitoring the strains and breeds (to perform this require substantial amount of human and financial resources).

2. Introduction of Fishing holidays

3. Restrict to fishing net sizes

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 ***main sources of information, important species for which the biotechnology is applied***
Selective breeding	○ Not at all ○ To a minor extent ◉ To some extent ○ To a great extent	Mainly is for O. niloticus and Clarius gariepinus
Hybridization	◉ Not at all ○ To a minor extent ○ To some extent ○ To a great extent	Aquaculture is a growing industry (at initial stages)
Polyploidy (chromosome set manipulation)	◉ Not at all ○ To a minor extent ○ To some extent ○ To a great extent	Aquaculture is a growing industry (at initial stages)
Monosex production	○ Not at all ○ To a minor extent ○ To some extent ◉ To a great extent	O. niloticus monosex only spp
Marker assisted selection	◉ Not at all ○ To a minor extent ○ To some extent ○ To a great extent	Aquaculture is a growing industry (at initial stages)
Gynogenesis/androgenesis	◉ Not at all ○ To a minor extent ○ To some extent ○ To a great extent	Aquaculture is a growing industry (at initial stages)
Other **Continue adding row as necessary**	○ Not at all ○ To a minor extent ○ To some extent ○ 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 ***mark appropriate box***	Countermeasures and effects
Habitat loss and degradation	○ Strongly positive ○ Positive ◉ Negative ○ Strongly negative ○ No effect ○ Unknown	Law enforcement by strengthening MCS 1. Introduction of Fishing holidays 2. Introduce Quota system in fishing 3. Restrict to fishing net sizes
Pollution of waters	○ Strongly positive ○ Positive ○ Negative ○ Strongly negative ○ No effect ◉ Unknown	Information is still at research level.
Increased frequency of extreme climatic events and long-term climate change	○ Strongly positive ○ Positive ○ Negative ○ Strongly negative ○ No effect ◉ Unknown	Practice Agro forestry and trees planting along pond sides
Establishment of invasive species	○ Strongly positive ○ Positive ○ Negative ○ Strongly negative ○ No effect ◉ Unknown	Strengthen MCS
Introductions of parasites and pathogens	○ Strongly positive ○ Positive ○ Negative ○ Strongly negative ○ No effect ◉ Unknown	Strengthen disease surveillance system

Drivers that are changing aquatic ecosystems	Effect on AqGR ***mark appropriate box***	Countermeasures and effects
Impacts of purposeful stocking and escapes from aquaculture	◯ Strongly positive ◉ Positive ◯ Negative ◯ Strongly negative ◯ No effect ◯ Unknown	Fish stocks of the same native species have been introduced in the natural waters reservoirs
Capture fisheries	◯ Strongly positive ◯ Positive ◉ Negative ◯ Strongly negative ◯ No effect ◯ Unknown	Capture fisheries production is fluctuating
Other ***Continue listing other driverst*** Add Row Remove Row	◯ Strongly positive ◯ Positive ◯ Negative ◯ Strongly negative ◯ No effect ◯ Unknown	

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 sit*u 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 fisher*ies* 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

Aquaculture is a growing industry therefore, most of conservation measures are just been introduced.

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

Conservation of fish are mainly at Hatchery level where the Existing hatcheries maintaining fish in accordance to strains.

22. Please provide ex*amples* 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

Part V (section 67) of Fisheries Regulation of 2009 provides guidelines on how to deal with rare and endangered fish species. The existing plan is strengthen law enforcement on preservation of endangered or threatened farmed species and their wild relatives.

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 *in situ* conservation	Rank 1=Very Important 10=No importance
Preservation of aquatic genetic diversity	3
Maintain good strains for aquaculture production	1
Meet consumer and market demands	5
To help adapt to impacts of climate change	4
Future breed improvement in aquaculture	2
Please continue listing any other objectives as needed	
Future genetic resource availability within farmers vicinity	6
Add Row / Remove 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

The National Fisheries Policy and Strategy Statement (1997) has provisions for in-situ conservation and the policy is under review to include more of it to enhance their use in responsible and well managed aquaculture and culture-based fisheries.

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

Conservation is mainly done by hatchery facilities after collection of brood stock from wild.

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

This is well clarified in the National Fisheries Policy (1997), The Fisheries Act No. 22 of 2003 and its Regulation of 2009. The Government has formulated Marine Park and Reserve Unit for the conservation of marine aquatic genetic resources.

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 ***provide any additional information***	
Marine Protected area: Bongoyo Island Marine Reserve	(•) Very effective ( ) Somewhat effective ( ) Not effective ( ) Unknown	It is managed under Marine Park and Reserve Unit Act of 1994 for protection and management of marine resources.	X
Marine Protected area: Mbudya Island Marine Reserve	(•) Very effective ( ) Somewhat effective ( ) Not effective ( ) Unknown	It is managed under Marine Park and Reserve Unit Act of 1994 for protection and management of marine resources.	X
Marine Protected area: Pangavini Island Marine Reserve	( ) Very effective ( ) Somewhat effective ( ) Not effective (•) Unknown	It is managed under Marine Park and Reserve Unit Act of 1994 for protection and management of marine resources.	X

Aquatic protected area	Effectiveness of conserving Aquatic Genetic Resources	Comments ***provide any additional information***	
Marine Protected area: Funguyasini Marine Reserve	◯ Very effective ◉ Somewhat effective ◯ Not effective ◯ Unknown	It is managed under Marine Park and Reserve Unit Act of 1994 for protection and management of marine resources.	X
Marine Protected area: Maziwi Island Marine Reserves	◯ Very effective ◉ Somewhat effective ◯ Not effective ◯ Unknown	It is managed under Marine Park and Reserve Unit Act of 1994 for protection and management of marine resources.	X
Marine Protected area: Mafia Island Marine Park	◯ Very effective ◉ Somewhat effective ◯ Not effective ◯ Unknown	It is managed under Marine Park and Reserve Unit Act of 1994 for protection and management of marine resources.	X
Marine Protected area: Mnazi Bay - Ruvuma Estuary Marine Park (MREMP)	◯ Very effective ◉ Somewhat effective ◯ Not effective ◯ Unknown	It is managed under Marine Park and Reserve Unit Act of 1994 for protection and management of marine resources.	X
Transfrontier Conservation Area encompassing (TFCA) Southern Regions and areas bordering Lake Nyasa in the countries like Malawi and Zambia.	◯ Very effective ◉ Somewhat effective ◯ Not effective ◯ Unknown	It is managed under Marine Park and Reserve Unit Act of 1994 for protection and management of marine resources.	X
Fresh water Protected area: Gombe Stream National Park, established: 1943	◉ Very effective ◯ Somewhat effective ◯ Not effective ◯ Unknown	It is managed under Natural Resources legislations: 1. Tanzania National Park Act of 1959: Part IV, Sections 21 and 23; 2. Restriction on entry into National Park Act No. 11 of 2003; 3. Hunting, capture, etc., in National Parks Act No. 27 of 1974; and 4. Restriction on exercise of mining Rights Government Notice No. 478 of 1962.	X

Aquatic protected area	Effectiveness of conserving Aquatic Genetic Resources	Comments ***provide any additional information***	
Fresh water Protected area: Kilimanjaro National Park, established: 1910s	(●) Very effective ( ) Somewhat effective ( ) Not effective ( ) Unknown	It is managed under Natural Resources legislations: 1. Tanzania National Park Act of 1959: Part IV, Sections 21 and 23; 2. Restriction on entry into National Park Act No. 11 of 2003; 3. Hunting, capture, etc., in National Parks Act No. 27 of 1974; and 4. Restriction on exercise of mining Rights Government Notice No. 478 of 1962.	X
Fresh water Protected area: Mikumi National Park, established 1964	(●) Very effective ( ) Somewhat effective ( ) Not effective ( ) Unknown	It is managed under Natural Resources legislations: 1. Tanzania National Park Act of 1959: Part IV, Sections 21 and 23; 2. Restriction on entry into National Park Act No. 11 of 2003; 3. Hunting, capture, etc., in National Parks Act No. 27 of 1974; and 4. Restriction on exercise of mining Rights Government Notice No. 478 of 1962.	X
Fresh water Protected area: Fresh water Protected area: Ruaha National Park established 1910	(●) Very effective ( ) Somewhat effective ( ) Not effective ( ) Unknown	It is managed under Natural Resources legislations: 1. Tanzania National Park Act of 1959: Part IV, Sections 21 and 23; 2. Restriction on entry into National Park Act No. 11 of 2003; 3. Hunting, capture, etc., in National Parks Act No. 27 of 1974; and 4. Restriction on exercise of mining Rights Government Notice No. 478 of 1962.It is managed under Natural Resources legislations: 1. Tanzania National Park Act of 1959: Part IV, Sections 21 and 23; 2. Restriction on entry into National Park Act No. 11 of 2003; 3. Hunting, capture, etc., in National Parks Act No. 27 of 1974; and 4. Restriction on exercise of mining Rights Government Notice No. 478 of 1962.	X
Fresh water Protected area: Rubondo Island National Park, established: 1977	(●) Very effective ( ) Somewhat effective ( ) Not effective ( ) Unknown	It is managed under Natural Resources legislations: 1. Tanzania National Park Act of 1959: Part IV, Sections 21 and 23; 2. Restriction on entry into National Park Act No. 11 of 2003; 3. Hunting, capture, etc., in National Parks Act No. 27 of 1974; and 4. Restriction on exercise of mining Rights Government Notice No. 478 of 1962.	X
Fresh water Protected area: Serengeti National Park established: 1929	(●) Very effective ( ) Somewhat effective ( ) Not effective ( ) Unknown	It is managed under Natural Resources legislations: 1. Tanzania National Park Act of 1959: Part IV, Sections 21 and 23; 2. Restriction on entry into National Park Act No. 11 of 2003; 3. Hunting, capture, etc., in National Parks Act No. 27 of 1974; and 4. Restriction on exercise of mining Rights Government Notice No. 478 of 1962.	X

Aquatic protected area	Effectiveness of conserving Aquatic Genetic Resources	Comments ***provide any additional information***	
Fresh water Protected area: Tarangire National Park established: 1970	(•) Very effective ( ) Somewhat effective ( ) Not effective ( ) Unknown	It is managed under Natural Resources legislations: 1. Tanzania National Park Act of 1959: Part IV, Sections 21 and 23; 2. Restriction on entry into National Park Act No. 11 of 2003; 3. Hunting, capture, etc., in National Parks Act No. 27 of 1974; and 4. Restriction on exercise of mining Rights Government Notice No. 478 of 1962.	X
Fresh water Protected area: Udzungwa Mountains National Park established: 1994	(•) Very effective ( ) Somewhat effective ( ) Not effective ( ) Unknown	It is managed under Natural Resources legislations: 1. Tanzania National Park Act of 1959: Part IV, Sections 21 and 23; 2. Restriction on entry into National Park Act No. 11 of 2003; 3. Hunting, capture, etc., in National Parks Act No. 27 of 1974; and 4. Restriction on exercise of mining Rights Government Notice No. 478 of 1962.	X
Fresh water Protected area: Ngorongoro Conservation Area established: 1959	(•) Very effective ( ) Somewhat effective ( ) Not effective ( ) Unknown	It is managed under Natural Resources legislations: 1. Tanzania National Park Act of 1959: Part IV, Sections 21 and 23; 2. Restriction on entry into National Park Act No. 11 of 2003; 3. Hunting, capture, etc., in National Parks Act No. 27 of 1974; and 4. Restriction on exercise of mining Rights Government Notice No. 478 of 1962.	X
Fresh water Protected area: Selous Game Reserve established: 1922	(•) Very effective ( ) Somewhat effective ( ) Not effective ( ) Unknown	It is managed under Natural Resources legislations: 1. Tanzania National Park Act of 1959: Part IV, Sections 21 and 23; 2. Restriction on entry into National Park Act No. 11 of 2003; 3. Hunting, capture, etc., in National Parks Act No. 27 of 1974; and 4. Restriction on exercise of mining Rights Government Notice No. 478 of 1962.	X
Fresh water Protected area: Lake Manyara National Park, established: 1957	(•) Very effective ( ) Somewhat effective ( ) Not effective ( ) Unknown	It is managed under Natural Resources legislations: 1. Tanzania National Park Act of 1959: Part IV, Sections 21 and 23; 2. Restriction on entry into National Park Act No. 11 of 2003; 3. Hunting, capture, etc., in National Parks Act No. 27 of 1974; and 4. Restriction on exercise of mining Rights Government Notice No. 478 of 1962.	X
Fresh water Protected area of the river mouth entering Lake Victoria	( ) Very effective (•) Somewhat effective ( ) Not effective ( ) Unknown	Provisions for critical Habitats which include Bays, Rivers, Islands and Beaches as mentioned in Fisheries Regulations of 2009.	X

Aquatic protected area	Effectiveness of conserving Aquatic Genetic Resources	Comments ***provide any additional information***	
Fresh water Protected area of the river mouth entering Lake Nyasa	◯ Very effective ◉ Somewhat effective ◯ Not effective ◯ Unknown	Provisions for critical Habitats which include Bays, Rivers, Islands and Beaches as mentioned in Fisheries Regulations of 2009.	X
Fresh water Protected area of the river mouth entering Lake Tanganyika	◯ Very effective ◉ Somewhat effective ◯ Not effective ◯ Unknown	Provisions for critical Habitats which include Bays, Rivers, Islands and Beaches as mentioned in Fisheries Regulations of 2009.	X
Fresh water Protected area of the river mouth entering Lake Rukwa	◯ Very effective ◉ Somewhat effective ◯ Not effective ◯ Unknown	Provisions for critical Habitats which include Bays, Rivers, Islands and Beaches as mentioned in Fisheries Regulations of 2009.	X
Fresh water Protected area of minor water as stipulated in the Fisheries Regulations (2009).	◯ Very effective ◉ Somewhat effective ◯ Not effective ◯ Unknown	Provisions for critical Habitats which include Bays, Rivers, Islands and Beaches as mentioned in Fisheries Regulations of 2009.	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 ***Please mark all that apply***	Is the species (or subspecies) threatened or endangered for example in the IUCN Red List, CITES Appendices or national lists? ***Please mark appropriate box***	Comments ***Please list any additional information***	
Oreochromis niloticus lake victoria strains	☒ Direct human consumption ☐ Live feed organism ☐ Other	○ Yes ◉ No ○ Unknown	Considerations are based on High fecundity, high growth rates, llow FCR. They are fond in lake victoria	X
Clarias gariepinus river Strains	☒ Direct human consumption ☐ Live feed organism ☐ Other	○ Yes ◉ No ○ Unknown	Considerations are based on High growth rates, low FCR. They are found in river systems.	X
Oreochromis mossambicus	☒ Direct human consumption ☐ Live feed organism ☐ Other	○ Yes ◉ No ○ Unknown	Found in the river ststem	X

Species (*include information on subspecies or strain in comments if available*)	Type of use ***Please mark all that apply***	Is the species (or subspecies) threatened or endangered for example in the IUCN Red List, CITES Appendices or national lists? ***Please mark appropriate box***	Comments ***Please list any additional information***	
Ozyptila panganica	☒ Direct human consumption ☐ Live feed organism ☐ Other	○ Yes ◉ No ○ Unknown	Found in the river ststem	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 ***List all that apply***	Type of *ex-situ* conservation collection *in vitro* ***mark all that apply***	Facilities where collection is located ***mark all that apply***	Comments ***list all breeds, subspecies of the species and any additional information***	
		☐ In vitro collection of gametes ☐ In vitro collextion of embryos ☐ In vitro collection of tissues ☐ Spores ☐ Other	☐ Aquaculture facilities ☐ Research facilities ☐ Universities ☐ Zoos and aquaria ☐ 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 *ex situ* conservation	Rank 1=Very Important 10=No importance
Preservation of aquatic genetic diversity	3
Maintain good strains for aquaculture production	1
Meet consumer and market demands	5
To help adapt to impacts of climate change	4
Future breed improvement in aquaculture	2
Other ***Continue adding row as necessary***	
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 ***mark all that apply***	Genetic resource of main interest ***mark all that apply***	Comments ***Please provide any information or explanation of stakeholders' role***
Fish Farmers	☒ Conservation ☒ Production ☒ Feed manufactoring ☒ Breeding ☒ Research ☒ Marketing ☒ Processing ☐ Advocacy ☒ Outreach/Extension ☐ Other (**specify**)	☐ DNA ☒ Stock, breed or variety ☒ Species ☐ Other	These are mainly done at pond levels and researchers work in collaboration with aqua farmers especially farmer driven research matter.
Fishers	☒ Conservation ☒ Production ☐ Feed manufactoring ☐ Breeding ☐ Research ☒ Marketing ☒ Processing ☐ Advocacy ☐ Outreach/Extension ☐ Other (**specify**)	☐ DNA ☒ Stock, breed or variety ☒ Species ☐ Other	Conservations are mainly done through fishers associations examples Beach Management Units (BMUs). BMUs control fishing and some are engaged on processing activities

Stakeholders	Role of stakeholder in regards og AqGR ***mark all that apply***	Genetic resource of main interest ***mark all that apply***	Comments ***Please provide any information or explanation of stakeholders' role***
Fish hatchery people	☒ Conservation ☒ Production ☒ Feed manufactoring ☒ Breeding ☐ Research ☒ Marketing ☐ Processing ☐ Advocacy ☐ Outreach/Extension ☐ Other (**specify**)	☐ DNA ☒ Stock, breed or variety ☒ Species ☐ Other	They collect various strains of fish and conserve them within their facilities.
People involved in marketing	☐ Conservation ☐ Production ☐ Feed manufactoring ☐ Breeding ☐ Research ☒ Marketing ☒ Processing ☐ Advocacy ☐ Outreach/Extension ☐ Other (**specify**)	☐ DNA ☒ Stock, breed or variety ☒ Species ☐ Other	They mainly market fish at market size
Government resource managers	☒ Conservation ☒ Production ☒ Feed manufactoring ☒ Breeding ☒ Research ☒ Marketing ☒ Processing ☒ Advocacy ☒ Outreach/Extension ☐ Other (**specify**)	☒ DNA ☒ Stock, breed or variety ☒ Species ☐ Other	The Government is responsible for Policy making and provides guidelines for conservation and management of fisheries and aquaculture resources.

Stakeholders	Role of stakeholder in regards og AqGR ***mark all that apply***	Genetic resource of main interest ***mark all that apply***	Comments ***Please provide any information or explanation of stakeholders' role***
Fishing or aquaculture associations	☒ Conservation ☒ Production ☒ Feed manufactoring ☒ Breeding ☐ Research ☒ Marketing ☒ Processing ☐ Advocacy ☐ Outreach/Extension ☐ Other (**specify**)	☐ DNA ☒ Stock, breed or variety ☒ Species ☐ Other	Conservations are mainly done through Aquaculture associations.
Aquatic protected area managers	☒ Conservation ☒ Production ☐ Feed manufactoring ☒ Breeding ☐ Research ☐ Marketing ☐ Processing ☒ Advocacy ☐ Outreach/Extension ☐ Other (**specify**)	☐ DNA ☒ Stock, breed or variety ☒ Species ☐ Other	The Marine Parks and Reserve Units established for conservation of fisheries resources under The Marine Parks and Reserve Act of 1994.
Policy Makers	☒ Conservation ☒ Production ☒ Feed manufactoring ☒ Breeding ☒ Research ☒ Marketing ☒ Processing ☒ Advocacy ☒ Outreach/Extension ☐ Other (**specify**)	☒ DNA ☒ Stock, breed or variety ☒ Species ☐ Other	Policy makers are responsible for guiding various stakeholders on management and conservation of Aquatic Genetic resources

Stakeholders	Role of stakeholder in regards og AqGR ***mark all that apply***	Genetic resource of main interest ***mark all that apply***	Comments ***Please provide any information or explanation of stakeholders' role***
Non-Governmental Organizations	☒ Conservation ☐ Production ☐ Feed manufactoring ☐ Breeding ☐ Research ☐ Marketing ☐ Processing ☒ Advocacy ☒ Outreach/Extension ☐ Other (**specify**)	☐ DNA ☒ Stock, breed or variety ☒ Species ☐ Other	Non-Governmental Organizations are linked to the Government to implement policies and other guidelines related to fisheries and aquatic resources including Genetic resources.
Intergovernmental Organizations	☒ Conservation ☐ Production ☐ Feed manufactoring ☐ Breeding ☒ Research ☐ Marketing ☐ Processing ☒ Advocacy ☐ Outreach/Extension ☐ Other (**specify**)	☐ DNA ☐ Stock, breed or variety ☐ Species ☐ Other	They are responsible for harmonizing activities linked to Aquatic Genetic resource conservation and management.
Donors	☒ Conservation ☐ Production ☐ Feed manufactoring ☐ Breeding ☐ Research ☐ Marketing ☐ Processing ☒ Advocacy ☐ Outreach/Extension ☐ Other (**specify**)	☐ DNA ☒ Stock, breed or variety ☒ Species ☐ Other	They include Heifer Project International and Religious Organizations

Stakeholders	Role of stakeholder in regards og AqGR ***mark all that apply***	Genetic resource of main interest ***mark all that apply***	Comments ***Please provide any information or explanation of stakeholders' role***
Consumers	☐ Conservation ☐ Production ☐ Feed manufactoring ☐ Breeding ☐ Research ☐ Marketing ☒ Processing ☐ Advocacy ☐ Outreach/Extension ☐ Other (**specify**)	☐ DNA ☐ Stock, breed or variety ☒ Species ☐ Other	

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

-Production of fingerlings to those employed in the Hatchery centres and also at farm level; and
-Fingerlings marketing

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

-Production of fingerlings in form of aqua farmers associations
-Fingerlings marketing
-Collection of wild relatives of farmed fish as broodstock

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 ***Select all that apply***	Comments ***Please provide any additional information for example whether it has been effective or not; and main sources of information***	
The National Fisheries Policy and Strategic Statements	Mar 8, 1997	☐ Genes or molecules only ☒ Aquaculture ☒ Capture fisheries ☒ Conservation ☐ Intellectual property protection ☐ Importation ☒ Trade and commerce ☐ Access and benefit sharing ☐ Other	The Fisheries Policy and Strategic Statement (1997) is under review and its details are in the Fisheries Act No. 22 of 2003	X
The Fisheries Act No. 22	Jan 1, 2003	☒ Genes or molecules only ☒ Aquaculture ☒ Capture fisheries ☒ Conservation ☒ Intellectual property protection ☒ Importation ☒ Trade and commerce ☒ Access and benefit sharing ☐ Other	This Act is under review	X

National legislation, policy and/or mechanism	Date established	Scope ***Select all that apply***	Comments ***Please provide any additional information for example whether it has been effective or not; and main sources of information***	
The Fisheries Regulations	Aug 28, 2009	☒ Genes or molecules only ☒ Aquaculture ☒ Capture fisheries ☒ Conservation ☒ Intellectual property protection ☒ Importation ☒ Trade and commerce ☒ Access and benefit sharing ☐ Other	Is under review	X
National Aquaculture Development Strategy	Jan 1, 2009	☐ Genes or molecules only ☒ Aquaculture ☐ Capture fisheries ☒ Conservation ☐ Intellectual property protection ☒ Importation ☐ Trade and commerce ☐ Access and benefit sharing ☐ Other		X
The Marine Parks and Reserves and its ammendment.	Mar 31, 1995	☐ Genes or molecules only ☐ Aquaculture ☒ Capture fisheries ☒ Conservation ☐ Intellectual property protection ☐ Importation ☐ Trade and commerce ☒ Access and benefit sharing ☐ Other		X
The Deep Sea Fishing Authority Act	Mar 31, 1998	☐ Genes or molecules only ☐ Aquaculture ☒ Capture fisheries ☒ Conservation ☒ Intellectual property protection ☒ Importation ☒ Trade and commerce ☒ Access and benefit sharing ☐ Other	This Act was ammended in 2007	X

National legislation, policy and/or mechanism	Date established	Scope ***Select all that apply***	Comments ***Please provide any additional information for example whether it has been effective or not; and main sources of information***	
The Deep Sea Fishing Authority Amendment Act	Mar 30, 2007	☐ Genes or molecules only ☐ Aquaculture ☒ Capture fisheries ☒ Conservation ☒ Intellectual property protection ☐ Importation ☒ Trade and commerce ☒ Access and benefit sharing ☐ Other		X
East African Community Protocol on Sanitary and Phytosanitary Measures	Jul 12, 2013	☐ Genes or molecules only ☒ Aquaculture ☒ Capture fisheries ☒ Conservation ☒ Intellectual property protection ☒ Importation ☒ Trade and commerce ☒ Access and benefit sharing ☐ Other		X
The Tanzania Fisheries Research Institute Act	Feb 2, 1980	☒ Genes or molecules only ☒ Aquaculture ☒ Capture fisheries ☒ Conservation ☒ Intellectual property protection ☒ Importation ☐ Trade and commerce ☐ Access and benefit sharing ☒ Other	To carry out research on issues related to capture fisheries and Aquaculture	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.

Laws reinforcement due to financial inadequacies; and Capacity Building (Human and Financial).

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 ***Please, provide verifiable main sources of information, effectiveness of the restriction, description of type of restriction and for whom does the restriction apply***
DNA	Access at the moment is only at research level.
Stock, breed or variety	
Species	The available National Fisheries Act No. 22 of 2003 restricts importation of live aquatic animal species. According to the existing legislations, it also restrict access to endangered fish species.
Other **Continue adding row as necessary** 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 ***Mark all that apply***	Comment ***for example other types of genetic resources***	
The country has introduced genetic manipulation through introducing sex reversal technology (monosex)	☐ DNA ☒ Genes ☐ Gametes ☐ Tissues ☐ Embryos ☐ Living specimens	There is high demand of monosex as the sector being transformed from subsistence to commercialized.	X
Implementation of legislations that restrict importation of fisheries resources	☒ DNA ☒ Genes ☒ Gametes ☒ Tissues ☒ Embryos ☒ 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 ***mark all that apply***	Comments ***please include additional information as needed***
Intellectual property protection	☐ DNA ☐ Stock, breed or variety ☐ Species ☐ Other	No obstacles noted.
National laws of your country	☐ DNA ☒ Stock, breed or variety ☒ Species ☐ Other	The available National Fisheries Act No. 22 of 2003 restricts importation of live aquatic animal species.
National laws of donor country	☐ DNA ☐ Stock, breed or variety ☐ Species ☐ Other	No obstacles noted.
Internationl laws or protocols	☐ DNA ☐ Stock, breed or variety ☐ Species ☐ Other	No obstacles noted.
Too expensive	☐ DNA ☐ Stock, breed or variety ☐ Species ☐ Other	No obstacles noted.
Material transfer agreements required	☐ DNA ☐ Stock, breed or variety ☐ Species ☐ Other	No obstacles noted.
Knowledge gaps	☐ DNA ☐ Stock, breed or variety ☐ Species ☐ Other	No obstacles noted.
Public perception	☐ DNA ☐ Stock, breed or variety ☐ Species ☐ Other	No obstacles noted.

Obstacles to accessing aquatic genetic resources	Please describe type of genetic resource ***mark all that apply***	Comments ***please include additional information as needed***
Other **Continue adding row as necessary** Add Row | Remove Row	☐ DNA ☐ Stock, breed or variety ☐ Species ☐ Other	

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

Tanzania Fisheries Research Institute (TAFIRI) was established under TAFIRI Act of 1980 with its main aim is to promote, conduct and manage fisheries research and consultancy for sustainable development of fisheries including research on Genetic resources in the country.

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 ***Mark all that apply***	Comments ***Please provide any additional information***	
Tanzania Fisheries Research Institute (TAFIRI)	☒ Genetic resource management ☐ Basic knowledge on aquatic genetic resources ☒ Characterization and monitoring of aquatic genetic resources ☒ Genetic improvement ☒ Economic valuation of aquatic genetic resources ☐ Conservation of aquatic genetic resources ☒ Communication on aquatic genetic resources ☐ Access and distribution of aquatic genetic resources ☐ Other	The Institute is responsible for research and dissemination of research findings to the users.	X
University of Dar es Salaam	☒ Genetic resource management ☒ Basic knowledge on aquatic genetic resources ☒ Characterization and monitoring of aquatic genetic resources ☒ Genetic improvement ☒ Economic valuation of aquatic genetic resources ☒ Conservation of aquatic genetic resources ☒ Communication on aquatic genetic resources ☒ Access and distribution of aquatic genetic resources ☐ Other	The University is responsible for training and research on fisheries and aquaculture issues including genetic resources.	X

Main institutions, organizations, corporations and other entities	Area of research ***Mark all that apply***	Comments ***Please provide any additional information***	
Sokoine University of Agriculture (SUA)	☒ Genetic resource management ☒ Basic knowledge on aquatic genetic resources ☒ Characterization and monitoring of aquatic genetic resources ☒ Genetic improvement ☒ Economic valuation of aquatic genetic resources ☒ Conservation of aquatic genetic resources ☒ Communication on aquatic genetic resources ☒ Access and distribution of aquatic genetic resources ☐ Other	The University is responsible for training and research on fisheries and aquaculture issues including genetic resources.	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	8
Improve capacities for characterization and monitoring of aquatic genetic resources	1
Improve capacities for genetic improvement	2
Improve capacities for genetic resource management	3
Improve capacities for economic valuation of aquatic genetic resources	5
Improve capacities for conservation of aquatic genetic resources	3
Improve communication on aquatic genetic resources	6
Improve access to and distribution of aquatic genetic resources	7
Add other rows as appropriate and rank Knowledge on conservation of genetic resources Add Row Remove Row	10

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 Dar es Salaam	Genetic resource management	☒ Undergraduate ☒ Post-graduate ☒ Training ☒ Extension		
	Characterization and monitoring of aquatic genetic resources	☒ Undergraduate ☒ Post-graduate ☒ Training ☒ Extension		
	Genetic improvement	☒ Undergraduate ☒ Post-graduate ☒ Training ☐ Extension		X
	Economic valuation of aquatic genetic resources	☒ Undergraduate ☒ Post-graduate ☐ Training ☐ Extension		
	Conservation of aquatic genetic resources	☒ Undergraduate ☒ Post-graduate ☒ Training ☒ 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	
Inter Ministerial linkages in which Ministry of Livestock and Fisheries Development collaborating with Ministry of Environment, Regional Administration and Local Government, Defence Forces, Ministry of Home Affairs, Land and Settlement, Surface Marine Transport Authority.	They team together during fisheries laws enforcement in public awareness, Monitoring, control and Management of fisheries resources conservation for sustainability.	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	5
Add other rows as appropriate and rank Increase financial capacities Add Row Remove Row	1

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 ***Please mark all that apply*** to your country	Comments	
Beach Management Units network of Tanzania	☐ Improve basic knowledge on aquatic genetic resources ☐ Improve capacities for characterization and monitoring of aquatic genetic resources ☐ Improve capacities for genetic improvement ☐ Improve capacities for economic valuation of aquatic genetic resources ☒ Improve capacities for conservation of aquatic genetic resources ☐ Improve communication on aquatic genetic resources ☐ Improve access to and distribution of aquatic genetic resources	They are responsible in Monitoring, controlling and conservation of fisheries resources.	X
Seaweed Association of Tanzania	☐ Improve basic knowledge on aquatic genetic resources ☐ Improve capacities for characterization and monitoring of aquatic genetic resources ☒ Improve capacities for genetic improvement ☐ Improve capacities for economic valuation of aquatic genetic resources ☒ Improve capacities for conservation of aquatic genetic resources ☐ Improve communication on aquatic genetic resources ☐ Improve access to and distribution of aquatic genetic resources	They exchange seaweed genetic resources during cultivation	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 ***mark all that apply***	Main stakeholders ***mark all that apply***	
Information in Books and handbooks	☐ DNA sequence ☐ Genes and genotype ☒ Breeds, strains or stocks ☒ Species names ☐ Production figures ☐ Distribution ☐ Level of endangerment ☐ Other	☐ Fish farmers ☐ Fishers in capture fisheries ☐ Fish hatchery people ☐ People involved in marketing ☐ Government resource managers ☐ Fishing or aquaculture associations ☐ Aquatic protected area managers ☒ University and academic people ☐ Non-Governmental Organizations ☐ Intergovernmental Organizations ☐ Policy makers ☐ Donors ☐ Consumers ☐ Politicians **Please list other stakeholders as necessary**	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

1. Human resources to support conservation, sustainable use and development of aquatic genetic resources;
2. Financial resources; and
3. Establishment of Genetic database system for information accumulation and sharing.

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[2] 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:

[2] 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	
The UN Convention on the Law of the Sea	1982	(•) Strongly positive ( ) Positive ( ) Negative ( ) Strongly negative ( ) No effect	(•) Strongly positive ( ) Positive ( ) Negative ( ) Strongly negative ( ) No effect		X

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	
THE ROME DECLARATION ON THE IMPLEMENTATION OF THE CODE OF CONDUCT FOR RESPONSIBLE FISHERIES	1999	(•) Strongly positive ( ) Positive ( ) Negative ( ) Strongly negative ( ) No effect	(•) Strongly positive ( ) Positive ( ) Negative ( ) Strongly negative ( ) No effect		X
SADC Protocol on Fisheries	2006	( ) Strongly positive (•) Positive ( ) Negative ( ) Strongly negative ( ) No effect	( ) Strongly positive (•) Positive ( ) Negative ( ) Strongly negative ( ) No effect		X
CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora)	1975	(•) Strongly positive ( ) Positive ( ) Negative ( ) Strongly negative ( ) No effect	(•) Strongly positive ( ) Positive ( ) Negative ( ) Strongly negative ( ) No effect	Tanzania and CITES have been working closely in order to address some of the technical difficulties in fulfilling the requirements of a CITES.	X
Cartagena Protocol on Biosafety	2003	( ) Strongly positive (•) Positive ( ) Negative ( ) Strongly negative ( ) No effect	( ) Strongly positive (•) Positive ( ) Negative ( ) Strongly negative ( ) No effect	The protocol has contributed to ensuring an adequate level of protection in terms of safe transfer, handling and use of living modified organisms resulting from modern biotechnology.	X

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	
Indian Ocean Rim Association (IORA)	1997	(•) Strongly positive ( ) Positive ( ) Negative ( ) Strongly negative ( ) No effect	(•) Strongly positive ( ) Positive ( ) Negative ( ) Strongly negative ( ) No effect	Tanzania through this association is promoting sustainable growth and balanced development; It also focus on areas of economic cooperation which provide maximum opportunities for development, shared interest and mutual benefits; and Is promoting liberalisation, remove impediments and lower barriers towards a freer and enhanced flow of goods, services, investment, and technology.	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 ***For example any critical gaps***
Improve information technology and database management	4	○ To a great extent ◉ To some extent ○ None ○ Unknown	It requires more emphasis especially establishing database system for information sharing
Improve basic knowledge on aquatic genetic resources	6	○ To a great extent ◉ To some extent ○ None ○ Unknown	Information is only available at research centres
Improve capacities for characterization and monitoring of aquatic genetic resources	1	○ To a great extent ◉ To some extent ○ None ○ Unknown	Information is only available at research centres
Improve capacities for genetic improvement	2	○ To a great extent ◉ To some extent ○ None ○ Unknown	Currently the country is focusing on Monosex Nile tilapia production
Improve capacities for economic valuation of aquatic genetic resources	7	○ To a great extent ○ To some extent ○ None ◉ Unknown	
Improve capacities for conservation of aquatic genetic resources	3	○ To a great extent ○ To some extent ○ None ○ Unknown	It requires more capacity as human resource development
Improve communication on aquatic genetic resources	5	○ To a great extent ○ To some extent ○ None ◉ Unknown	It requires more emphasis especially establishing database system for information sharing

Collaboration is needed in order to ...	Rank 1=Very Important 10=No importance	To what extent are the needs being met	Comments ***For example any critical gaps***
To improve access to and distribution of aquatic genetic resources	8	◯ To a great extent ◉ To some extent ◯ None ◯ Unknown	
Other **Continue adding row as necessary** Add Row Remove Row		◯ To a great extent ◯ To some extent ◯ None ◯ Unknown	

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

Tanzania has benefited to a greater extent from the following collaborations
1. The Rome Declaration on The Implementation of the Code of Conduct for Responsible Fisheries;
2. CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora);
3. The UNCLOS; and
4. Cartagena Protocol on Biosafety.
This is simply because, the agreements fits well our situations

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

1. Tanzania requires capacity building interms of human and financial support and also information sharing should be strengthened among members;
2. Collaboration on Hatchery management;
3. Collaboration on aquatic spp breeding improvement such as Seaweed breeding;
4. Collaboration on Aquatic disease control and management;
5. Collaboration on genetic data collection and database establishment; and
5. Collaboration on aquatic animal feeds production technologies.

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.

The country has the following roles:
1. Develop internal inter sectoral linkages within the ministry to ensure that resources are well conserved and managed;
2. Develop policies and guidelines for conservation and management of resources;
2. Develop inter Ministerial linkage system to manage resources; and
3. Ensure that laws are enforced for better conservation and management of resources.

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