



REPUBLIC OF ZAMBIA

**MINISTRY OF COMMERCE, TRADE AND INDUSTRY
AND**

MINISTRY OF FISHERIES AND LIVESTOCK

NATIONAL AQUACULTURE TRADE DEVELOPMENT STRATEGY AND ACTION PLAN

2020 – 2024





Republic of Zambia

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Ministry of Fisheries and Livestock
Lusaka

September, 2020



Foreword



As world fisheries stocks are plateauing in regards to sustainable fish food supply, the aquaculture sub-sector is increasingly playing an important role in contributing to the supply of fish foods and related aquatic products. Aquaculture growth and development has been evident globally and in Zambia with production figures increasing more than three fold in the last eight years from around



12,000 MT in 2012 to 38,480 MT in 2019, representing significant increase of 220 percent. Despite recording trade deficits during the past period, the aquaculture industry together with capture fisheries presents great opportunities for trade and trade-related activities across the entire value chain from input supply, production, processing and marketing.

The Strategy articulates the avenues for unlocking the country's aquaculture potential by identifying priority and strategic areas for the Government and the industry to address. The Strategy outlines challenges constraining progress in the value chain, clear objectives and action points that will drive the sector forward. It identifies pertinent areas that will help develop the sub sector including research development, training and capacity building, infrastructure development, aquatic biosecurity, standards, technical regulations, testing, certification, business and trade across the entire value chain.

The Strategy focusses on producing tangible outputs including implementation of strategic research and development, effective extension service delivery improved market access, strengthened aquatic biosecurity, improved environmental performance and increased investments in the sector. The Strategy will be implemented using a multi sectorial approach at national level, with a regional focus to take advantage of market openness within SADC and COMESA, while building the necessary synergies with regional initiatives such as; the SADC Aquaculture strategy. Coupled with other efforts, we hope to increase the current Aquaculture production in the next five years to about a 150,000 MT. Through innovations at various levels, the subsector will continue to improve value chain techniques for the current fish species and related products, identify new products, strengthen existing markets and develop new markets within the country and the entire SADC and COMESA regions.

The successful implementation of the National Aquaculture Trade Development Strategy is dependent on buy-in from stakeholders and established frameworks for collaboration to facilitate implementation, monitoring and evaluation of set objectives. Therefore, coordination, monitoring and evaluation are key components of this Strategy. Specific institutions have been identified to take the lead in the implementation of specific interventions while MCTI and MFL will have an oversight responsibility for the monitoring and evaluation of this Strategy.

We, therefore, appeal to all stakeholders to collaborate with the two lead Ministries so that we enhance an economically driven aquaculture and fisheries sector in a profitable and sustainable manner for the benefit of the Zambian people.

Hon. Christopher Yaluma, MP
**MINISTER OF COMMERCE, TRADE
AND INDUSTRY**

Hon. Nkandu Luo, MP
MINISTER OF FISHERIES AND LIVESTOCK

September, 2020

Acknowledgement



The accomplishment of the National Aquaculture Trade Development Strategy required the collective effort and comprehensive consultations with various key stakeholders taking into consideration international best practice. This Strategy embodies the needs and aspirations of the subsector and the nation as a whole, to which fulfilment of the government is strongly committed to pursue.



Special recognition goes to the SADC-EU Funded Trade Related Facility Project for the financial and technical support rendered throughout the process of developing the National Aquaculture Trade Development Strategy. Further, we take recognition of the enormous dedication and contributions made by the various stakeholders including Government, Development Partners, NGOs, Private Sector, and the Aquaculture Association. Their views collectively gave rise to this document. Particular gratitude goes to the Ministry of Commerce, Trade and Industry and the Ministry of Fisheries and Livestock for taking lead in the development process of the Strategy. Gratitude also goes to other Government line Ministries and Agencies who include: Cabinet Office – Policy Analysis and Coordination Division; Ministry of Agriculture; Ministry of National Development Planning; Ministry of Lands and Natural Resources; Ministry of Health, Zambia Statistics Agency; Zambia Environmental Management Agency; Zambia Revenue Authority; Zambia Development Agency; and Zambia Bureau of Standards. Also we wish to recognise input from: WorldFish; Natural Resources Development College; University of Zambia; Aquaculture Development Association of Zambia; Zambia Aquaculture Enterprise Development Project; Enhanced Small-holder Agribusiness Promotion Programme; Indaba Agriculture Policy Research Institute; and the Private Sector.

While the Government will assume its expected role as the leading stakeholder in implementing the Strategy, it will do so in a manner that all the other stakeholders shall have equitable and responsible participation in the process. This multi-stakeholder participatory approach demonstrated in the formulation of this document shall apply throughout the implementation of the Strategy. The two Ministries pledge their full support to making the vision a reality for the people of Zambia.

Mushuma Mulenga
Permanent Secretary
MINISTRY OF COMMERCE, TRADE
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Dr. Benson Mwenya
Permanent Secretary
MINISTRY OF FISHERIES AND LIVESTOCK

September, 2020



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Working Definitions and Concepts

Aquaculture: Cultivation, propagation or farming of fish, aquatic vegetation, or other living aquatic resources whether from eggs, spawn, spat or seed or by rearing fish lawfully taken from the wild or lawfully imported into the country, or by other similar process.

Aquaculture facility: Any equipment, construction, enclosure, place or area, whether on land or in water, in which aquaculture is conducted.

Biosecurity: The concept of applying appropriate measures (e.g., proactive disease risk analysis) to reduce the probability of harmful biological organism or agent spreading to an individual, population, or ecosystem, and to mitigate the adverse impact that may result.

Capture fisheries: All kinds of harvesting of naturally occurring living resources in both marine and freshwater environments.

Contaminant: Any biological or chemical agent, foreign matter or other substances not intentionally added to food that may compromise food safety or suitability.

Contamination: The introduction or occurrence of a contaminant in fish, shellfish or their products.

Control measure: Any action or activity that can be used to prevent or eliminate a food safety hazard or reduce it to an acceptable level. For the purposes of this Code, a control measure is also applied to a defect.

Disease: A deviation from the state of complete physical or social wellbeing of an organism involving a well-defined set of symptoms and ichthyology that leads to an impairment of the organism's normal function.

Fish: Any vertebrate fish alive or dead and any part thereof, whether or not preserved in any form, and includes fin, shell fish, the young and eggs but does not include a genetically modified organism.

Fish farm: An aquaculture production unit (either land or water-based), usually consisting of holding facilities (tanks, ponds, raceways, cages), plant (buildings, storage, processing), service equipment and stock.

Fish feed: Fodder intended for fish in aquaculture establishments, in any form and of any composition.

Hazard: A biological, chemical or physical agent in food or the condition of food with the potential to cause an adverse health effect.

Production and productivity: Production is a function of an organisation associated with the conversion of range of inputs into desired outputs. Productivity is a measure of how efficiently resources are combined and utilised for the purpose of achieving the desired outcome.

Market: All the applicable parts of the supply chain where an affected food may be located.



Recall: The removal of an unsafe food from the market when it may have reached the consumer and the notification of the consumer.

Residues: Any foreign substance, including their metabolites that remain in fish prior to harvesting as a result of either application or accidental exposure.

Residues of veterinary drugs: The veterinary drugs as defined in 'Veterinary drug' including parent drugs, metabolites and associated impurities in the animal tissue, produce and products of animal origin of which are used for human food.

Risk: A function of the probability of an adverse health effect and the severity of that effect, consequential to a hazard.

Standard: Document approved by a recognised body that provides, for common and repeated use, rules, guidelines or characteristics for products or related processes and production methods, with which compliance is not mandatory. It may also include or deal exclusively with terminology, symbols, packaging, marking or labelling requirements as they apply to a product, process or production method.

Technical regulation: A Government document that lays down product characteristics or their related processes and production methods, including the applicable administrative provisions, with which compliance is mandatory. It may also include or deal exclusively with terminology, symbols, and packaging, marking or labelling requirements as they apply to a product, process or production method.

Traceability: The ability to trace and follow a food, feed, food-producing animal or substance intended to be, or expected to be incorporated into a food or feed, through all stages of production, processing and distribution.

Trade Logistics and Facilitation: The efficiency of the supply chain in terms of transparency and ease of rules and regulations, and the availability of support services, facilities and infrastructure.

Unsafe food: Food that is injurious to health or unfit for human consumption.

Veterinary drug: Any substance applied or administered to any food-producing animal, such as meat- or milk-producing animals, poultry, fish or bees, whether used for therapeutic, prophylactic or diagnostic purposes or for modification of physiological functions or behaviour.



Acronyms/Abbreviations

ADAZ	Aquaculture Development Association of Zambia
AfDB	African Development Bank
APMEP	Agriculture Productivity and Market Enhancement Project
BMP	Best Management Practices
CEEC	Citizen Economic Empowerment Commission
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
COMESA	Common Market for Eastern and Southern Africa
DDCC	District Development Coordinating Committee
DoF	Department of Fisheries
DRC	Democratic Republic of Congo
DVS	Department of Veterinary Services
EA	Environmental Assessment
EAA	Ecosystem Approach to Aquaculture
EIA	Environmental Impact Assessment
EPB	Environmental Project Brief
E-SAPP	Enhanced Small Holder Agribusiness Promotion Project
EU	European Union
EUS	Epizootic Ulcerative Syndrome
FAO	Food and Agriculture Organisation
GDP	Gross Domestic Product
GM	Gross Margin
GRZ	Government of the Republic of Zambia
JICA	Japanese International Corporation Agency
IAPRI	Indaba Agriculture Policy Research Institute
ICES	International Council for the Exploration of the Sea
IFAD	International Fund for Agricultural Development
IFC	International Finance Corporation
ILO	International Labour Organisation
ISO	International Organisation for Standardisation
LCF	Large Commercial Farmer
MCTI	Ministry of Commerce Trade and Industry
M&E	Monitoring and Evaluation
MFL	Ministry of Fisheries and Livestock
MMS	Management Monitoring System
MoA	Ministry of Agriculture
MOH	Ministry of Health
MT	Metric Tonnes
NADP	National Aquaculture Development Plan
NAIP	National Agriculture Investment Plan
NALEIC	National Livestock Epidemiology and Information Centre
NAP	National Agricultural Policy
NARDC	National Aquaculture Research and Development Centre
NES	Non-Edible Substances
NFDS	Nordenfjeldske Development Services
NRDC	Natural Resources Development College



NTE	Non-Traditional Export
OIE	World Organisation for Animal Health
PDCC	Provincial Development Coordinating Committee
REC	Regional Economic Community
R&D	Research and Development
SADC	Southern African Development Community
SEA	Strategic Environmental Assessment
SME	Small and Medium-sized Enterprises
SNAP	Second National Agriculture Policy
SNDP	Seventh National Development Plan
SPP	Species
SSF	Small-Scale Farmer
TiLV	Tilapia Lake Virus
TRF	Trade Related Facility
UNZA	University of Zambia
USD	United States Dollar
VAT	Value Added Tax
VC	Value Chain
VCA4D	Value Chain Analysis for Development
WARMA	Water Resources Management Authority
WFP	World Food Programme
ZABS	Zambia Bureau of Standards
ZAEDP	Zambia Aquaculture Enterprise Development Project
ZCSA	Zambia Compulsory Standards Agency
ZDA	Zambia Development Agency
ZEMA	Zambia Environmental Management Authority
ZMW	Zambian Kwacha
ZMA	Zambia Metrology Agency
ZNFU	Zambia National Farmers Union
ZRA	Zambia Revenue Authority
ZSA	Zambia Statistics Agency



Executive Summary

Aquaculture and fisheries has become a very important sub-sector of the economy as it has potential to contribute to economic diversification, food security and nutrition, improved rural livelihood and sustainable employment generation in Zambia. The joint extension efforts by the Government of the Republic of Zambia and stakeholders have seen aquaculture expand in all the ten (10) provinces of the country. Zambia is among the largest aquaculture producers in sub-Saharan Africa with an estimated production of about 38,480 MT in 2019. Zambia has also become the largest producer of tilapia in the SADC region. On the other hand, production from the capture fisheries has stagnated in the recent past, producing about 91,342 MT of fish in 2019. Despite being among the largest producers in aquaculture in the sub-Saharan Africa, Zambia's production and international trade in fish and fishery products has maintained deficits. The highest deficit in trade was recorded in 2016 at 126,000 MT, implying that the country was a net importer. The major regional source of fish imports was the SADC region, accounting for an annual average share of 80.8 percent. Among the SADC member states, Namibia was the dominant source of imports for Zambia's fish and fishery products at 97.6 percent. Other notable sources were South Africa and Mozambique.

The low production and trade in Zambia's fish and fishery products have been caused by several challenges being faced in the sub-sector. Some of the notable challenges affecting the aquaculture value chain include low production and productivity, low processing and value addition, trade deficits, low investments and credit access, high aquaculture risks coupled with low risk management. Others are weak legal frameworks including regulations, standards, certification, weak collaborations for synergies and low investments in research and development.

The National Aquaculture Trade Development Strategy has been developed taking into account the global, regional and national developments and is further informed by analysis of strengths, weaknesses, opportunities and threats in the Aquaculture and fishery sub-sectors.

The Strategy covers both Aquaculture and fisheries but with a lot of focus on aquaculture. The Strategy sets out a strategic vision to have an Aquaculture and Fisheries sub-sector that provides quality fish and fishery products, contributing to increased fish exports while ensuring national food and nutritional security. The Strategic set targets include; to grow the total exports of fish and fishery products by about 150% in real value by 2024, to grow the percent (%) share of fish and fishery products to total exports to grow between 1 to 2% by 2024 and boosting Aquaculture Production from 30,000MT to 150,000MT by 2024.

The Strategic overall objective outlined towards the attainment of this strategic vision is to contribute to trade and market development of fish and fishery products through enhanced aquaculture and capture fisheries production and productivity for socio-economic development. The specific objectives cover thematic areas including: sustainable fish production and productivity; export market access and diversification; value addition; investments in the aquaculture and capture fisheries value chain; Research and Development; compliance to standards and certification of fish and fishery products; and contribution of fish and fishery products to the non-traditional exports and to the total export earnings in general.

The formulation of this Strategy has been informed by various policy and legal frameworks. It has also been aligned to the Vision 2030, and the aspiration of the Seventh National Development Plan under the development outcomes: Economic Diversification and Job Creation Strategic Area, with specific focus on;



a Diversified and Export-Oriented Agriculture Sector; and Improved access to domestic regional and international markets.

The Strategy also takes into account cross-cutting issues such as youth and gender inclusiveness, HIV/AIDS, Research and Development (R&D), Environmental Safety and Protection, child labour laws and disability. The implementation of the Strategy takes a multi-sectoral approach involving all stakeholders at National, Provincial and District levels, including the private sector.

The MFL and the MCTI are the lead Government institution responsible for coordination, implementation and administration of the National Aquaculture Trade Development Strategy. Other key implementing Ministries and Agencies include: MoA, CEEC, ZABS, ZCSA, ZDA, ZMA, ZEMA, WARMA among others.

The other institutions key in the implementation of the Strategy include the Private Sector through the umbrella associations such as the: Aquaculture Development Association of Zambia (ADAZ); Academia and Research Institutions (the University of Zambia, Copperbelt University, Natural Resources

Development College; Indaba Agricultural Policy Research Institute and WorldFish Centre); Business Associations; Non-State Actors; Cooperating Partners (such as IFAD through the Enhanced Smallholder Agribusiness Promotion Programme (E-SAPP), CSOs; and NGOs.

Mobilisation and allocation of resources to the Ministries, Provinces and Spending Agencies (MPSAs) for the implementation of the National Aquaculture and Fisheries Trade Development Strategy is mandated to the Government of the Republic of Zambia through the Ministry of Finance (MoF) supplemented by support from cooperating partners. Government through the two lead Ministries is expected to create a friendly business environment that will promote the development of the sector and facilitate trade through the creation of an enabling environment for the private sector.

The Strategy will be implemented over a period of five (5) years from 2020 to 2024. Monitoring will be done routinely on a monthly, quarterly and annual basis. A mid-term review is planned within two and half years of implementation and end-term evaluation two months before expiry of the Strategy.



1.0 Introduction

The Republic of Zambia is endowed with abundant water resources, which largely support fresh water capture fisheries, and in the recent past aquaculture development. The major perennial rivers are the Zambezi, Kafue, Luangwa, Kabompo, Luapula and Chambeshi. Other sources of surface water include lakes and swamps. The major lakes include Tanganyika, Mweru, Bangweulu, Kariba and Itezhi-tezhi (the latter two being man-made). In their endeavour to promote fish production in general, the Government and stakeholders have focused on promoting community-based resource management of capture fisheries through sustainable fish exploitation to improve catches, but also with concerted and deliberate efforts to promote aquaculture development, and improve marketing and processing facilities to promote distribution network through the marketing value chains.

The joint extension efforts by the Government and stakeholders have seen aquaculture expand in all ten (10) Provinces of the country, putting Zambia among the largest aquaculture producers in sub-Saharan Africa with an estimated production of 36,105 MT in 2018

increasing to 38,480 MT in 2019 (DoF 2018/19). Zambia has also become the largest producer of tilapia in the SADC region (Genschick et al., 2017). On the other hand, the capture fisheries have in the recent past produced 88,075 MT of fish in 2016 increasing to 91,342 MT in 2019 (DoF 2017/20). Aquaculture and fisheries has, therefore, become a very important sub-sector of the economy as it is potentially contributing to economic diversification, food security, rural livelihood, income generation and sustainable employment generation (FAO, 2018).

Despite the steady increase in aquaculture production, there is still a huge supply deficit to meet the local and international export market. Statistics indicate a 50 percent supply deficit from local production. Additionally, the per capita consumption of fish is decreasing as the population increases. For instance, the per capita consumption was 12kg in the 1970s' compared to 7.7 kg in 2012 (Kefi and Mofya, 2015).

In view of the growing fisheries sub-sector, the government has developed the National Aquaculture Trade Strategy with the aim of providing a framework that will formalise and enhance trade in fish and fishery products at regional and international levels.



2.0 Background

2.1 Historical Perspective of the Aquaculture and Fisheries Sector in Zambia

Fish farming in Zambia can be traced back to the 1950s when the first attempts were made to raise indigenous species of the Cichlidae family, specifically tilapias, in dams and earthen fishponds. The Government with support from its Cooperating Partners has taken an active role in promoting aquaculture development and sustainable capture fisheries. This has been done by introducing climate-resilient pond culture methods in rural areas as a way of improving food and nutrition security, and incomes. The Government has further trained and provided aquaculture extension officers that have made significant improvements to fish culture activities. In view of the above Government interventions, there has been a significant development in the aquaculture sub-sector between 2005 and 2018. There has been an increase in small-scale fish farmers from 6,000 to about 21,498. There has also been an increase in fishponds from 5,000 to over 37,672 throughout the country, predominantly in the Eastern, North-western, Northern and Luapula provinces. Further, there has been an increase in the number of commercial farms from 15 to 20 active large commercial fish farms spread along the railway line in Copperbelt, Lusaka and Southern Provinces.

During the years 2004 to 2009, small-scale subsistence farmers had dominated the aquaculture sector, with production averaging 5,100MT mostly for subsistence purposes with little impact on total fish supply for ordinary consumers. From 2012 onwards, Zambia experienced increased aquaculture production from 12,988MT to 36,105MT in 2018 increasing to 38,480MT in 2019 (DoF 2018/19). The increase is largely attributed to entry of large-scale commercial fish farmers in the industry and expansion of entrepreneurial aquaculture

particularly in the cage culture sector from large-scale pond-based enterprises. As regards to the capture fisheries, the production in 2018 was at 89,195MT as compared to 88,075MT in 2017 (DoF, 2018).

Fish farming systems range from extensive to intensive and from multi-species to mono-species culture. There are three levels of fish farmers, namely small-scale, smallholder and commercial. Government has recognised the potential for further development of aquaculture and catch fisheries subsectors.

Under the formal trade channels reported by the Zambia Statistics Agency, the quantity of exported fish increased from 271 MT in 2016 to 1,057 MT in 2017. According to the fish trade and border monitoring survey undertaken from 2015 to 2017 by Worldfish and partners, an estimate of 102,263 MT of fish was recorded to have been informally exported to the neighbouring countries, of which 95 percent was exported to the DRC through the Kasumbalesa border. Informal fish trade has implications on the Government, as this leads to revenue losses due to tax evasion and food safety concerns in case of poor quality products. With the increase in informal trade of fish and fish products, it becomes imperative that the country recognises the importance of tapping the full potential of this important economic activity through formalisation of trade. Identifying best practices in the process of transitioning from informal to formal markets could realise the full potential of the actors involved in the trade of fish and fishery products.

2.2 Investment Opportunities in Fisheries and Aquaculture

The huge demand for fish and fishery products emanating from within the country and the regional markets creates an opportunity for



Zambia to invest in the aquaculture sub-sector. The country has 15 Million hectares of water in the form of rivers, lakes and swamps, which enhances investment opportunities in the sub-sector. Furthermore, Zambia is strategically located to supply the regional market. The sub-sector has huge investment potential in feed production, seed production, aquaculture processing equipment and technology. Others are irrigation development and equipment to support aquaculture, extension service delivery, transportation and capacity building.

2.3 Guidance for the Strategy and Strategic Operational Linkages

The formulation of this Strategy has been informed by policy and legal framework, including: the preceding National Aquaculture Strategy 2006; National Quality Policy (2010); National Aquaculture Development Plan (2015–2020); National Industrial Policy; National Trade Policy; National Export Strategy (2018–2022); National Investment Promotion

Strategy (2018–2022); SADC Regional Aquaculture Strategy and Action Plan (2016 – 2026); Second National Agricultural Policy (2016–2020); National Agriculture Investment Plan (2014–2018); and the fisheries legislation which is under revision to include aquaculture regulations.

The Strategy has also been aligned to the Vision 2030, and the aspiration of the Seventh National Development Plan under the development outcomes: Economic Diversification and Job creation Strategic Area, with specific focus on; a Diversified and Export-oriented Agriculture Sector; and Improved access to domestic, regional and international market. It is envisaged that the Strategy will bolster investments and support the aquaculture and fisheries sector to increase its contribution to the national economy. Growing the aquaculture and fisheries sector will also assist the Government of Zambia to tackle the so-called “youth bulge” which is a manifestation of the growing “army” of unemployed youth.



3.0 Situation Analysis

3.1 Global Context

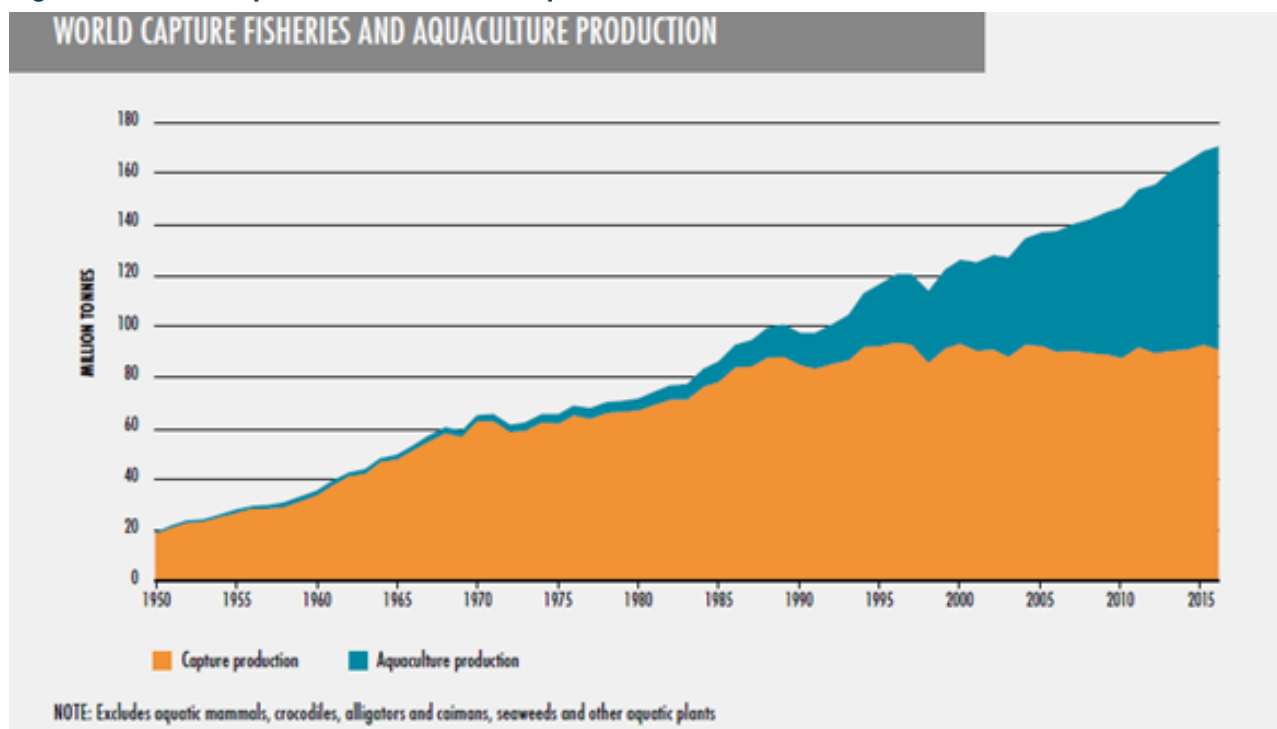
World trade in fish and fishery products grew significantly in terms of value, with exports rising from USD 8 billion in 1976 to USD 143 billion in 2016, at an annual growth rate of 8 percent in nominal terms and 4 percent in real terms. About 35 percent of global fish production entered international trade in various forms in 2016. As demand for fish and fishery products is sensitive to income levels of consumers, trends in international fish trade depend to a large degree on the global economic environment. Other important factors that influence the international fish trade include exchange rate trends, climatic events and large-scale disease outbreaks. China has since 2002 been the largest exporter of fish and fishery products as well as the world's third largest importer of fish and fishery products, partly because large quantities of fish are imported for processing and then re-exported (FAO, 2018).

Several factors have been identified to affect access of fish and fishery products to international markets by exporting countries. These include structural constraints that affect the quality of fish products, contributing to product loss or difficulty in marketing them. Other hurdles include non-tariff trade measures such as required product standards, sanitary and phyto-sanitary measures, procedures for import licensing, rules of origin and conformity assessment; and handling of customs classifications, valuation and clearance procedures, including lengthy or duplicative certification procedures and customs fees. The full implementation of the WTO Trade Facilitation Agreement, which entered into force in 2017, is expected to expedite the movement, release and clearance of goods across borders, reducing these negative influences on trade internationally (FAO, 2018).

Globally, fish production peaked at about 171 Million MT in 2016 with capture production accounting for 91.0 Million MT while aquaculture production accounted for 80.0 Million MT of food fish (Figure 1), representing 53.2 percent and 46.8 percent, respectively (FAO, 2018). The production of farmed food in 2016 included 54.1 Million MT of fish. China besides being the largest exporter of fish and fishery products has continued to be the major producer of farmed fish from the year 1991, and in 2016 China alone produced more than what the rest of the world combined produced (FAO, 2018). The production of aquaculture is significantly increasing and capture fisheries have become relatively static thus aquaculture production is likely to be more than half of the world's production by 2020-2021 (FAO, 2018).

As at 2016, 194 out of 202 aquaculture countries were recorded by FAO as the active ones over the past few years (FAO, 2018). The following countries are among the countries that have been considered as the major producers and have strengthened their production in the last decade: Egypt, Nigeria, Chile, India, Indonesia, Vietnam, Bangladesh and Norway.

The average annual increase in global food fish consumption was estimated to be 3.2 percent between 1961 and 2016. In per capita terms, food fish consumption grew from 9.0kg in 1961 to 20.3kg in 2016, at an average rate of about 1.5 percent per annum (FAO, 2018). The expansion in consumption has been driven not only by increased production, but also other factors, including reduced wastage, better utilisation, improved distribution channels demand, linked with population growth, rising incomes and urbanisation.

Figure 1: World Capture Fisheries and Aquaculture Production

Source; FAO, 2018.

A number of standards-setting bodies exist. These bodies have facilitated the development of various standards along the fish value chain to enable various industries produce quality fish and fishery products. These standards setting bodies include the Codex Alimentarius, International Organisation for Standardisation (ISO) and many more. Under Codex, a number of standards have been developed covering various products and practices along the fish value chain to promote trade and public health. These standards are often incorporated in national regulation for fish and fishery products among countries.

3.2 Regional Context

According to a study done by SADC in 2015, Africa had a total fish production of 1.6 Million MT of which SADC had 69,851 MT, representing about 4 percent. The SADC region has recently experienced steady increase in overall fisheries production due to increase in aquaculture production in some of the Member States. The

aquaculture subsector has generated an annual average growth rate of about 13 percent. Total aquaculture production was about 56,000 MT in 2014. The overall capture fisheries production trends indicate that the region produces only 2.6 Million MT, which has more or less stagnated. The fisheries sub-sector in the SADC region contributes an average of about 2 percent to the SADC GDP, with total average exports worth USD152 Million and average imports of USD100 Million. The sub-sector employs an average of 145,000 people, through which more than a Million benefit indirectly. Per capita fish consumption in the region is 11kg, which constitutes an average of 16 percent of the total animal protein intake and 5 percent of the total protein intake. This makes the contribution of fisheries to food and nutrition security in the region significant.

Diseases and epizootics are considered a major concern for the increasing production through aquaculture and for the sector development (Subasinghe & Bondad, 2006). At international



level, biosecurity frameworks include the Sanitary and Phytosanitary Measures Agreement and OIE standards. Furthermore, there are other international guidelines related to fisheries, aquaculture and biodiversity. A number of these guidelines concern the movement and introduction of animals, which are relevant to biosecurity. This may include the Code of conduct for responsible fisheries (FAO, 1995), the Technical Guidelines for Responsible Fisheries (FAO, 1997), the International Treaty on Biodiversity (Convention on Biological Diversity, 5 June 1992) and ICES guidelines on introduction and transfers of marine organisms (International Council for the Exploration of the Sea (ICES), 2005).

In SADC, a number of initiatives have been devised to harmonise standards for fish and fishery products in order to promote trade among the member countries. However, there is no legal framework at regional level to compel member states to adopt harmonised standards at national level. This has resulted in different regulatory requirements in member states even after standards have been harmonised resulting in the hindrance of flow of trade in the region.

3.3 National Context

3.3.1 Production and Productivity

The Zambian Government through the Department of Fisheries has exerted concerted effort to see that aquaculture can attain growth. As a result, aquaculture production increased to 38,480 MT in 2019 from 12,988 MT in 2012 representing an increase of 196 percent (DoF, 2020). The aquaculture production systems comprise of the small scale, large land cultured based fisheries and water based. Of the 2018 production total; 4,784 MT is attributed to small-scale producers, whilst 3,718 MT is from large land (pond) based producer, 3,252 MT from culture based fisheries, and 24,351 MT from water based (cage culture). Zambia was ranked

fifth in aquaculture production in Africa as at 2016, moving from the sixth position in 2014. Small-scale farmers are dotted throughout the country with the largest numbers found in Northern, North-Western, Eastern and Copperbelt provinces where the majority are still being recruited. The results of the 2018 fish-farming survey for small-scale farmers revealed a national productivity rate of 4.1 MT/ha (DoF, 2019). The emerging commercial sector, engaged in intensive cage and pond-based aquaculture of mostly non-native tilapia species, has been responsible for the bulk of annual production (Kaminski et al., 2018). Fish from large-scale producers is distributed to major cities throughout the country in different forms, including frozen, fresh on ice, and, to a much lesser extent, filleted.

Most jobs in the current value chain are provided by the small-scale farmers (SSFs). Based on data from the MFL, the estimation of jobs is approximately 13,000, which are primarily on-farm and among SSFs. Due to the relatively large number of small aquaculture farms and relatively lower efficiency (compared to the LCF), SSFs provide the bulk of the jobs. The estimations are based on feed conversion rates of 2.5 for SSFs and 1.6 for LCFs.

3.3.2 Consumption Pattern

In comparison to the global and regional per capita consumption trend, Zambia's consumption reduced from 12kg in 1970s to 7.7kg in 2012 and further increased to about 9kg in 2018. This is still less than FAO recommended 24kg per capita consumption. The consumption of fish in Zambia varies greatly according to geographic location and wealth status. Fish consumption is generally higher in rural areas than urban areas while low-income groups in comparison to high-income groups spend proportionally more on fish than on any other animal-food source. In absolute terms, fish consumption per capita is also higher in rural areas than in urban areas, in particular

in Northern, Western and Luapula provinces where there are established capture fisheries (NFDS 2016). Some rural areas have high fish consumption per capita, for instance, 13.9 kg/year was reported in Chililabombwe and 27.2 kg/year in Siavonga. However, the bulk of this fish is made up of dried small pelagic fish or small indigenous wetland species rather than large tilapia (NFDS 2016). This might have an implication on the productivity of small-scale fish farmers and motivation to practice aquaculture as the supply of fish is largely met by capture fisheries in these areas.

3.3.3 Contribution to GDP

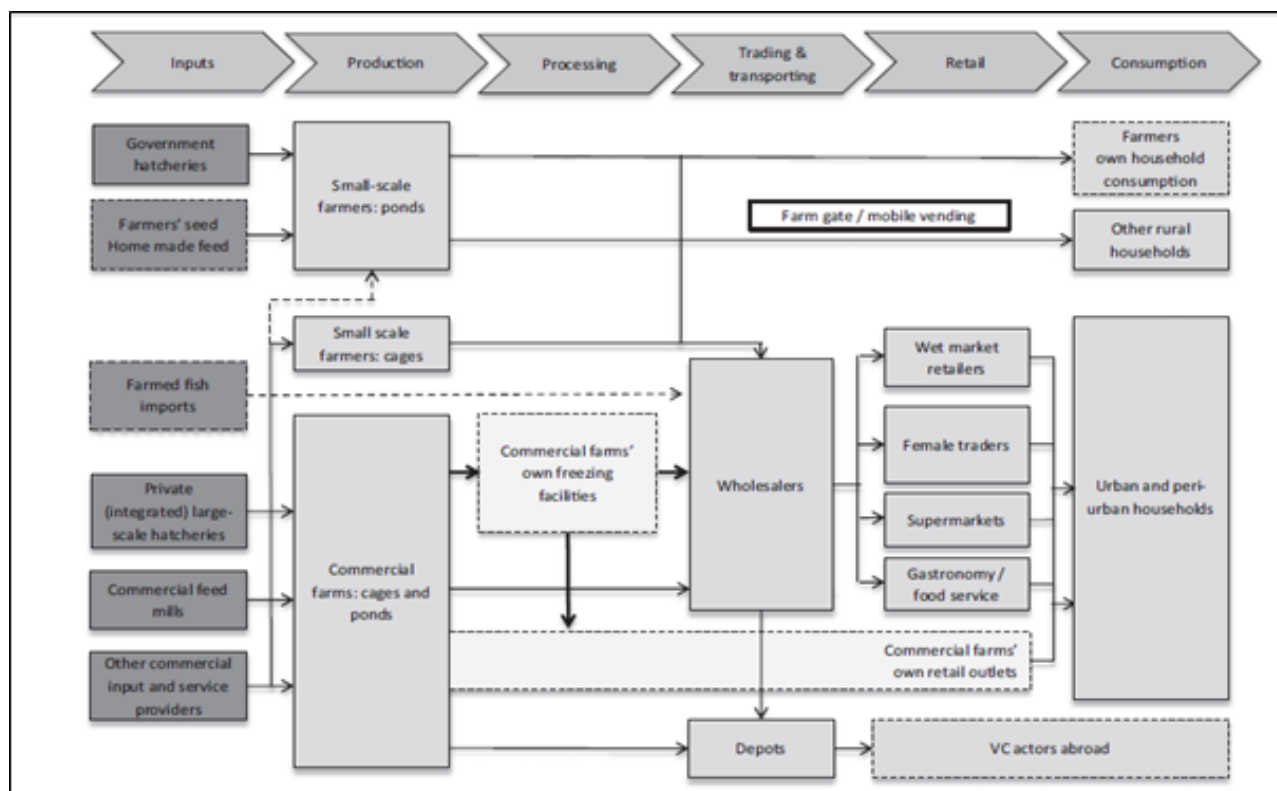
Contribution of Aquaculture to GDP at current prices increased steadily from K131.79 Million (0.09 percent) in 2013 to K615.06 Million (0.28 percent) in 2016, after which it dropped to K284.79 Million (0.12 percent) in 2017, while the overall GDP at purchaser's price has been on a

steady rise. Aquaculture and Capture Fisheries sector contributed an annual average of 7.4 percent to the Agriculture, forestry and fishing sector, of which Aquaculture accounted for 3.2 percent annually (CSO, 2019).

3.3.4 Aquaculture Value Chain

The aquaculture Value Chain covers a broad range of stakeholders, including seed producers, feed producers, farmers, processors, distributors, and retailers. The Zambian aquaculture industry today is characterised by a value chain with two distinct and separate categories (Figure 2), a traditional category driven by donor and government support of smallholder farmers, referred to by the DoF as the 'small-scale' category; and an emerging, commercial category driven by capital investments into medium and large companies, referred to as the 'large-scale' category.

Figure 2: Map of the aquaculture value chain in Zambia.



Source: Kaminski et al. [2018]



The fish seed sector has been operated primarily by Government run hatcheries across the country. However, hatcheries have had various operational challenges thereby working below capacity. There has also been an increase in the number of private players producing fingerlings for fish farming. In 2018, Government hatcheries produced 843,490 fingerlings, which is 0.45 percent contribution to the total fingerling production estimated at 196,295,240 (DoF, 2019). By 2017, eight feed mills had established a supply of domestically produced pelleted fish feed (sinking and floating) for commercial aquaculture. Whilst exact production data is unavailable, various key informants within the feed sector have reported that domestic production of aqua-feeds reached around 30,000MT in 2016. Fish feeds are relatively expensive owing to the fact that a major fish feed ingredient is imported. However, the sub-sector exports fish feeds to the SADC region.

Farmed fish from large-scale producers is transported in fresh/frozen form to consumers countrywide with the high proportion going to Lusaka and Copperbelt provinces. Transportation of fish is managed through either contracted logistics companies or vertically integrated transport and retail operations. Most large-scale producers do not own distribution and retail functions, and therefore sell to commercial fish traders who supply cold storage logistics and conduct further value addition such as filleting and packaging.

A study on the Zambian aquaculture value chain was conducted by the European Union (EU) in 2018 which detailed the economic, social, and environmental issues (Table 1) impacting the value chain growth.

Table 1: Economic, Social and Environmental Constraints

ECONOMIC	SOCIAL	ENVIRONMENTAL
• Competition with imports. • High costs of feed (in particular for small-scale farmers). • Non-availability of the essential raw materials locally (proteins, amino acids and vitamins) for feed production, leading to high cost of fish feed and affecting availability of product. • High cost attributed to import duties, taxes, and procedures at entry points. • High cost of sex reversed fingerlings • Inadequate access to good quality seed (sex reversed). • Poor roads, expensive transport. • Uncontrolled imports with associated reductions in import duties. • Imported fish of poor quality. • Long and complicated licensing processes for medium/ large-scale farms. • Longer production cycles.	• As larger-scale operations continue to grow and become the dominant player in the VC, smallholder/rural farmers could get excluded. • Gender stereotypes are adhered to and promoted • Limited roles for youth. • Rural people could be displaced off their lands as the sector grows. • Capital intensive water-based systems could exclude smallholder farmers lacking the required initial and working capitals. • Few rural people have access to labour saving technologies. • Possible impacts on staple food prices due to high demand for feed and negative effect on food and nutrition security among the rural and urban poor. • Group fish farming does not lead to productive results. • Inadequately-trained personnel or farmers available.	• Indirect environmental impacts due to commercial feed based on dedicated crops which exert themselves impacts on the environment. • Water pollution by aquaculture effluents.

Extracted from; Aquaculture Value Chain Analysis in Zambia Report (Kruijssen et al., 2018)

In addition to the above constraints, the aquaculture and capture fishery sector is faced with:

- Difficulties gaining regional and other international markets due to non-tariff barriers and absence of formalised free trade area agreements;
- Poor logistical infrastructure and arrangements especially in the rural areas;
- Low capacity and knowledge to produce and supply quality fish and fish products;
- Land degradation due to pond abandonment; and
- Unsustainable exploitation of the fishery resource.

3.4 Fish and Fishery Products Market Analysis

3.4.1 International Trade Performance for fish and fishery products (2014-2019)

Zambia's international trade in fish and fishery products has maintained deficits, with the highest recorded in 2016 at 126,000 MT. This means that the country was a net importer. The major regional source of fish imports was SADC Exclusive, accounting for an annual average share of 80.8 percent. Within this grouping, Namibia was the dominant source with 97.6 percent. Other notable sources were South Africa and Mozambique. The major fish and fishery products imported were frozen mackerel accounting for an annual average share of 75 percent of the fish imported, followed by frozen tilapia at 9.9 percent. Imports of fish recorded a share of 1.27 percent



annually to the import bill. Import volumes indicated an increase from 55,184 MT in 2014 to 126,345 MT in 2016, thereafter recorded a decline to 103,202 MT and 95,539 MT in 2018 and 2019, respectively.

Fish Exports accounted for an annual average share of 0.02 percent of Zambia's Total Exports and 0.06 percent of the Non-Traditional Exports (NTEs) from period running 2014 to 2019. The major fish and fishery products exported were live fish accounting for an annual average share of 35.5 percent, followed by frozen tilapia at 14.0 percent and dried fish (not smoked) at 12.2

percent. Exports have been significantly low in comparison to imports. This can be highly attributed to unrecorded (informal) exports to the Congo DR. Export volumes recorded a significant increase from 136 MT in 2014 to 1,058 MT in 2017, thereafter declined to 532 MT in 2018 but increased significantly to 2,951 MT in 2019. The major export regional market was the dual COMESA & SADC accounting for an annual average share of 47.3 percent. Within this grouping, Congo DR was the dominant market with 82.8 percent. Other notable markets in this grouping were Malawi and Zimbabwe.

Table 2: Contribution of Fish to Zambia's Trade, 2014 to 2019

Indicator	2014	2015	2016	2017	2018	2019	Annual Average
Total Exports (Fob) (K'Million)	59 613.36	56 672.89	65 751.57	76 491.83	94 486.93	90 739.85	73 959.41
Of Which:							
Fish (K'Million)	3.19	4.17	5.15	12.84	8.53	50.14	14
Annual Share Of Fish In Exports (%)	0.01	0.01	0.01	0.02	0.01	0.06	0.02
Non- Traditional Exports (NTEs)	14 791.32	15 673.53	19 490.56	17 172.88	23 211.42	25,969.11	19 384.8
Annual Share Of Fish In NTEs (%)	0.02	0.03	0.03	0.07	0.04	0.19	0.06
Total Imports (Cif) (K'Million)	61 088.40	68 482.50	75 120.17	76 136.13	99 252.42	92 456.91	78 756.09
Of Which:							
Fish (K'Million)	475.67	1 015.98	1 016.17	1 210.71	1 154.87	1,464.37	1 056.30
Annual Share Of Fish In Imports (%)	0.78	1.48	1.35	1.59	1.16	1.58	1.32
Fish Trade Balance (K'Million)	-472.48	-1 011.81	-1 011.02	-1 197.87	-1 146.34	-1,414.23	-1 042.29

Source: CSO, External Trade Unit

There is huge domestic trade for various products including fish that occurs in the country. However, it is very difficult to capture data on local trade activities due to lack of a systematic collection mechanism. The biggest market for fish and fish products in Zambia is in Lusaka and Copperbelt provinces.

3.4.2 Gross Margins Estimations

The gross margin estimates were based on the study conducted by IAPRI which looked at the costs, revenue and pond sizes from 100 small-scale farmers in the districts surveyed. The variables used to estimate the gross margins include the cost of fingerlings, feed, labour, and transportation shown in Table 3.

Table 3: Gross Margins for Fish by Pond Size

	Based on Recommended Feed management (600m ²)	Average Size Pond (544m ²)	150-500m ²	500-700
Production Cycle (Months)	6	6	6	6
Variable Costs				
Average Fingerlings Stocked	6000	2,348	2,094.00	4,006.00
Cost per Fingerling	0.55	0.55	0.55	0.55
Cost of Fingerlings	3,300.00	1,291.40	1,151.70	2,203.30
Cost of Feed	19,250	1,850.00	1,634.22	3,041.43
Cost of labour	1,800.00	1,800.00	1,800.00	1,800.00
Cost of Manure	250	202	125.99	294.54
Transport Cost	200	185	181	202
Total Cost	24,800.00	5,328.40	4,892.91	7,541.27
Fish Sold in one Cycle (Kgs)	1,796	502	358	685
Price per kg	25	24	24	24
Revenue	44,900.00	12,048.00	8,592.00	16,440.00
Gross Margins	20,100.00	6,719.60	3,699.09	8,898.73
Margins %	45%	56%	43%	54%

Source: IAPRI, 2017

Assumptions applied for gross margin calculations
10% mortality of fish stocked
Size of fish at harvest (minimal feeding) 200g
Size of fish at harvest (recommended feeding-commercial complete feed) 350g
Feed types surveyed (Single ingredients, commercial complete, own formulated feed)
Home consumption: 5% of harvest
Average Labour cost K300/month

The analysis of gross margins presented in Table 3 above is positively indicating that fish farming enterprise is profitable and can contribute to household incomes. The gross margins, however, vary across the different sizes of the ponds from K3,699.09 to K20,100.00. The averagely sized ponds of 544m² generate approximately K12,048.00 per production cycle and the estimated gross margin is K6,719.60.

For the purposes of gross margins calculations, the average cost of hired labour was used for all the fish farmers interviewed in this study. The analysis also reveals that the cost of labour, feed, and fingerlings accounted for the large proportion of the cost of fish farming in the study area.



3.5 SWOT Analysis

Strengths	Weaknesses
- Competent Authorities to ensure safety and certification of fish and fish products - Private-sector driven - Available standards for fish and fisheries products. - Available expertise - Availability of Laboratories - Available skills development training facilities - Available disease surveillance system	- Lengthy customs and bureaucratic formalities at border posts - Illegal/Informal cross border trade - Porousness of borders - Inadequate collaboration and coordination amongst different agencies (nationally and internationally) - Lack of aquaculture regulations - Inadequate extension services - Limited Research and Development - High cost of production in aquaculture - Underdeveloped value chains for fish and aquaculture products - Aggregated official trade statistics - Lack of good tracking mechanism for domestic trade - Inadequate support from financial institutions - Inadequate cooling chain (blast freezing) at the stage of marketing - Inadequate/Untimely budgetary allocation
Opportunities	Threats
- A strong political will and conducive political atmosphere - High resource potential (Natural resources) - Conducive climatic conditions - Strong support from developmental partners - Supportive infrastructure (Roads, Communication) - Strategic location and access to important regional and international markets - Untapped/high demand domestic, regional and global markets - Research and Development for growth of the value chain - Stagnated production from capture fisheries - Laboratory Accreditation opportunities - Increased donor support (e.g. Aquaculture Seed Fund) - Untapped investment opportunities in cold storage - Investment potential in skills development within the sector - High investment potential in fishmeal processing - Deliberate plans to support investment in local firms selling essential raw materials unavailable locally. - Ornamental fish breeding opportunities	- Regional instability (Political) - Disease introductions - Unfair competition with fish imports - Conflicts in land use - Pollution of water sources for aquaculture from industrial activities - Food safety concerns from both domestic & imported fish and aquaculture products - High and variable input costs - Introduction of invasive/exotic species - Advent of climate change

3.6 Biosecurity

Currently in Zambia, only the large-scale commercial aquaculture facilities have robust biosecurity systems and measures in place. Small-scale fish farmers and artisanal fishers demonstrate little or no knowledge of the importance of aquatic biosecurity. This could pose a danger to aquaculture as diseases such as Epizootic Ulcerative Syndrome (EUS) that have been affecting fish in the capture fisheries could easily be transmitted from the wild to the fish farm environment. In addition,

lax biosecurity or a total lack of it raises the risk of emerging diseases such as Tilapia Lake Virus (TiLV) infection being introduced into the country. Biological samples collected and analysed during a recent quick disease surveillance study conducted by WorldFish and Partners (DVS, UNZA and DOF) on a limited number of commercial fish farms and some sites in the capture fisheries were negative for TiLV (WorldFish Report, 2018). To protect this favourable disease status in aquaculture, fish disease surveillance and biosecurity need to be enhanced, not only on grow-out farms and hatcheries, but also in the capture fisheries.



4.0 Cross Cutting Issues

4.1 Gender Inclusiveness

Among the small-scale, male fish farmers are dominant in aquaculture production accounting for over 80 percent in a number of provinces (Namonje-Kapembwa and Samboko, 2017; Mwango et al., 2016). The high resource constraints coupled with the knowledge intensiveness of aquaculture makes this sub-sector highly male dominated. Therefore, targeting women farmers to enter into aquaculture production by reducing the main barriers to entry and success can be a way out of poverty especially given the relatively high income that they can potentially earn.

4.2 Research and Development (R&D)

Research and Development has remained underfunded in fisheries as is the case for the rest of the agricultural sector. As a result, there are major limitations in terms of innovations coming from R&D for the development of the fisheries sector. The Department of Fisheries has the overall responsibility of providing research services on both capture fisheries and aquaculture. Each major fishery has a research station whose aim is to assess and analyse through quantitative methods and population models the level of exploitation of fish stocks as well as fish species composition and distribution. Fisheries research on lakes, reservoirs and floodplain river systems focuses on needs for resource protection and fish stock enhancement. Other emerging research areas include the ecology of exploited species, fisheries ecology, bio-economics, fisheries economics, limnology, fishing gear, fishing technology, systematics and fisheries law. Fisheries research in Zambia has mainly dealt with the two areas of fish biology and ecology (FAO, 2006).

4.3 Environmental Safety and Protection

In Zambia, the forests, wildlife, fisheries, wetlands and protected areas constitute a basis for livelihoods for the majority of the people as a resource base, and the backbone of the country's economy. Therefore, sustainable management and utilisation of these natural resources is cardinal if the country is to achieve its aspirations of broad-based and equitable sustainable development (NBSAP – 2, 2015 -2025).

Environmental management is essential for ensuring equitable and profitable fisheries and aquaculture trade in Zambia and at the same time ensures environmental sustainability (African Union Commission, 2014, Burnell et al, 2009). Environmental sustainability aims at protecting natural environment, human and ecological health, while driving innovation to contribute to the quality of environment on a long-term basis (Everett et al, 2010, Bailey et al, 2000).

Globally, Ecosystem Approach to Aquaculture (EAA) has been explored and used (Soto et al, 2008). EAA promotes sustainable development of interlinked ecosystems and management of the aquaculture sector in a way that does not threaten the wider ecosystem (Soto et al, 2008). There is need for controlled and regulated aquaculture development to minimise and possibly prevent pollution, disruption of habitats and exploitation of natural resources (Soto et al, 2008). Environmental standards are therefore, critical for the protection of the environment. Environmental Assessment (EA) is also a commonly used tool in environmental management to ensure environmental sustainability. EA helps in recognising key impacts in the development of the supply chain, surrounding environment, water management and project site (Inter-African Bureau for Animal Resources, 2016). EA is recommended as a mitigation measure in minimizing environmental impact.



4.4 Climate Change

Studies on Climate Change in Zambia have revealed that there has been an increase in the frequency of extreme events such as floods and droughts over the past four decades. Further, the studies have shown that the rainy season is becoming shorter (starting late and ending early) and more intense (NPCC, 2016). If this trend continues, the Nation's abundant water bodies will be negatively affected. This in turn will have a bearing on the Aquaculture and Fisheries sub-sector which until now has enjoyed favourable conditions as a result of the abundant waters.

4.5 Disability

Persons with different abilities have been viewed in Society as people who require charity. However, persons with disabilities are responsible individuals capable of contributing significantly to the development of society (National Disability Policy, 2015). In view of this, the National Aquaculture Trade Development Strategy should aim to remove all barriers that exclude persons with disabilities from participating in this sub-sector.

Disability and Poverty are said to be interlinked. Not only does disability add to the risk of poverty but also conditions of poverty add to the risk of disability (ibid). Therefore, there is need to develop technologies and strategies that will enable people who are differently abled to participate in Aquaculture and capture fisheries as a way to fight poverty.



5.0 Vision, Rationale and Guiding Principles

5.1 Vision

An Aquaculture and Fisheries sub-sector that provides good quality fish and fishery products contributing to increased fish exports while ensuring national food and nutritional security.

5.2 Rationale

The National Aquaculture Trade Development Strategy has been developed with the aim of providing the much needed framework that will formalise and enhance Zambia's trade in fish and fishery products at domestic, regional and international levels.

Fish supply in Zambia is largely dependent on capture fisheries, which contributes nearly 70 percent of the country's total production. However, fish catches have been declining in all the water bodies in the country and yet demand for fish has been increasing due to increased human population. The need for enhancing aquaculture production was realised several decades ago when a World Bank study pointed out an increasing gap between fish supply and demand (World Bank 1978).

The growth of the small-scale aquaculture sub-sector is affected by several challenges and remains largely supported by national and international development programmes. The major impediments to the growth of fisheries sub-sector especially aquaculture include inadequate finances, poor quality fingerlings, lack of technical skills, high cost and/or non-availability of fish farming inputs, poor road infrastructure especially feeder roads and provision of extension services. The small-scale fish farmers are most affected in most parts of the country because of these limitations, hence the slow expansion of fish farming. There was need to develop a strategy to address the challenges and foster development in the sector.

5.3 Guiding Principles

The Strategy will be administered by the following guiding principles, which are aligned to the SADC Aquaculture Strategy and shall be adhered to by all stakeholders in its implementation:

- i. Inlusiveness - it is necessary that deliberate efforts are made to ensure broad participation of all relevant stakeholders. In addition, other disadvantaged groups such as women, youths and people with disabilities should be given equal opportunities to actively participate in the implementation of the Strategy;
- ii. Realism and Implementability - interventions and measures in this strategy should be based on a realistic implementation plan informed by results-based management principles. The focus must be on the realistic attainment of specific objectives in line with national priorities;
- iii. Value addition - The interventions to be spearheaded at the regional level will be limited to those that clearly add value or generate solutions to national initiatives;
- iv. Sustainability - Application of Ecosystem Approach to Aquaculture (EAA) and international Best Management Practices (BMP) will guard against undesirable bio-ecological and socio-economic outcomes.
- v. Responsiveness - interventions and measures should be responsive to the needs of the sub-sector and be aligned to the broader national objective of reducing inequality, poverty, employment creation and uplifting the living standards of the majority in line with the vision 2030.

Policy Predictability- this strategy underscores the need for policy consistency, transparency and commitment to a conducive and predictable economic environment.



6.0 Objectives, Measures and Targets

6.1 Overall Objective

To contribute to trade and market development through enhanced aquaculture and capture fisheries production and productivity for socio-economic development.

6.2 Overall Targets

- Total exports of fish and fishery products to grow by about 150% in real value by 2024;
- Percent (%) share of fish and fishery products to total exports to grow between 1 – 2% by 2024;
- Boost Aquaculture Production from 38, 000MT to 150, 000 MT by 2024;
- Maintain high levels of biosecurity to prevent the spread of diseases and preserve biodiversity of fish stocks; and
- Maintain high international standards on use of chemicals to attain internationally accepted minimum residue limit levels.

6.3 Specific Objectives, Measures and Targets

Specific Objective 1: To increase sustainable fish production and productivity of the aquaculture and capture fisheries sub-sector.

Strategic Measures:

- Promote production of diversified farmed-fish species;
- Enhance access to quality fish seed;
- Facilitate access to business development services by small and medium aquaculture entrepreneurs;
- Promote local feed production amongst small-scale farmers;
- Facilitate access to finance to support small-scale farmers; and
- Promote sustainable exploitation of fisheries and good aquaculture practices.

Targets:

- Kafue bream in the second generation of genetic improvement by 2024;
- At least two (2) species (Green-headed bream and Tanganyika bream) in the process of genetic improvement by 2023;
- African catfish production increased by at least 20% by 2024;
- At least 30 TOTs trained annually;
- At least 600 entrepreneurs trained in the aquaculture value chain annually;
- At least two (02) hatcheries certified annually;
- At least five (5) existing hatchery operators trained annually;
- At least eight (08) new Hatcheries established and operationalised by 2024;
- At least four (04) Fish farmer groups per province linked to business development service providers annually;
- Operationalise three (03) land-based and two (02) water-based Aquaculture Park by 2024;
- At least three (3) viable cooperatives/ farmer groups venturing in aquaculture formed per province annually;
- At least five (5) fish farmer groups/ cooperatives per district linked to credit facilities annually; and
- 400 aquaculture extension officers employed in each camp by 2024.

Specific Objective 2: To increase total export earnings through improved trade logistics and facilitation and access for fish and fishery products to domestic, regional and international markets.

Strategic Measures:

- Enhance efficiency in domestic fish markets;
- Promote development of market infrastructure; and

- iii. Improve access to regional and international markets.

Targets:

- i. Cost of marketing and post-harvest losses reduced by 5% annually;
- ii. At least ten (10) fish markets infrastructure constructed by 2024/r];
- iii. Capacity in fish quality standards and market requirements enhanced; and
- iv. Total exports of fish and fishery products to grow by about 30% in real value annually.

Specific Objective 3: To promote and increase investments in the aquaculture and capture fisheries value chain.

Strategic Measures:

- i. Promote local and foreign direct investment in the sub-sector; and
- ii. Enhance value addition to fish and fishery products.

Targets:

- i. At least two (2) local and four (4) Foreign Direct Investment (MNCs) set up in the aquaculture and fisheries sub-sector by 2024; and
- ii. Volume of processed fish increased by 20% of fish harvest by 2024.

Specific Objective 4: To improve Capacity in Research and Development in the aquaculture and fisheries sub-sector.

Strategic Measures:

- i. Improve research in aquaculture and fisheries value chain; and
- ii. Strengthen institutional capacity to undertake R&D.

Targets:

- i. At least three (3) scientific research papers published by 2024;
- ii. At least two product-types developed (such as caviar and fish oil) by 2024;
- iii. An aquaculture research fund established by 2024;
- iv. At least two (2) indigenous fish species cultured by 2024;
- v. At least one (1) on-farm training conducted by research institutions annually;
- vi. At least one (1) R&D initiative and five (5) staff exchange visits undertaken annually;
- vii. At least two (2) seminars held by research institutions for aquaculture and fisheries actors annually; and
- viii. Five (5) R&D facilities developed and/or rehabilitated by 2024.

Specific Objective 5: To improve compliance to standards, technical regulations and certification of fish and fishery products.

Strategic Measures:

- i. Ensure compliance to the domestic, regional and international legal framework that governs fisheries and aquaculture subsector; and
- ii. Develop and strengthen the monitoring and surveillance system of compliance to standards, technical regulations and certification.

Targets:

- i. 5,000 copies of IEC materials developed and distributed by 2023;
- ii. At least one (1) spot check done per quarter per province;
- iii. All institutions to start implementing SPS measures by 2024;
- iv. Regulations and standards developed and implemented by 2023;
- v. Monitoring systems for compliance to standards and certification implemented by 2023; and



- vi. At least five (5) institutions implementing active surveillance by 2024.

Specific Objective 6: To enhance collaboration among stakeholders in the fisheries and aquaculture sub-sector.

Strategic Measures:

- i. Promote stakeholder engagements through established national coordinating structures;
- ii. Integrate fisheries activities in District and Provincial Development Planning and reports; and
- iii. Strengthen multi-sectoral coordination in monitoring and evaluation of the fisheries and aquaculture sub-sector.

Targets:

- i. ICT Platform (such as SMS and Web based) established by 2022;
- ii. One consultative meeting conducted at National level annually;
- iii. Two consultative meetings conducted at Provincial level annually ;
- iv. Two (2) consultative meetings conducted at District level annually; and
- v. Monitoring and Evaluation tool on aquaculture and fisheries developed by 2022.

Specific Objective 7: To promote public and environmental health in the Aquaculture and Fisheries Sub-sector.

Strategic Measures:

- i. Promote food safety in the aquaculture and fisheries value chain;
- ii. Enhance disease surveillance in the aquaculture and fisheries value chain; and
- iii. Strengthen the public health legal framework in the aquaculture and fisheries value chain.

Targets:

- i. Six laboratories constructed and equipped at active border points by 2024;
- ii. Existing laboratories renovated and equipped regularly by 2024;
- iii. National food safety system for fish and fishery products developed by 2022;
- iv. Disease surveillance system set up by 2022;
- v. Sensitise at least 400 farmers on fish diseases annually;
- vi. Food safety Bill enacted by 2022; and
- vii. At least four (4) public health awareness activities on food safety conducted annually.

Specific Objective 8: To promote and facilitate the formal trade of fish and fishery products.

Strategic Measures:

- i. Enhance sector-specific legislations and policies that directly promote sustainable small enterprises; and
- ii. Strengthen interventions that promote compliance with formal business requirements such as registration and obtaining various permits.

Targets:

- i. Relevant Policy and Legislation/Regulations developed and reviewed by 2024;
- ii. Businesses registered along the Aquaculture and fish value chain increased by at least 10% annually;
- iii. Formal trade compliance levels increased by 70% by 2024; and
- iv. Online one-stop centre for application of permits developed and operationalised by 2023.



Specific Objective 9: To mainstream cross-cutting issues along the aquaculture and fisheries value chain.

Strategic Measures:

- i. Promote gender, disability and youth inclusiveness along the aquaculture and fisheries value chain;
- ii. Reduce prevalence of child labour, HIV and gender-based violence among the operators in the fish value chain; and
- iii. Mainstream climate change mitigation and adaptation strategies in aquaculture and fisheries.

Targets:

- i. Women and youth participation in the value chain increased by at least 40% and 20% for persons living with disabilities by 2024;
- ii. At least one (1) sensitisation activity on child labour, HIV and gender-based violence undertaken in each province annually; and
- iii. Climate smart practices adopted at each stage across the value chain by 2024.



7.0 Strategy Coordination and Management

7.1 Institutional and Implementation Framework and Co-ordination

Effective implementation of the Strategy is key to the achievement of the strategic vision and targets, as such will take a multi-sectoral approach involving all stakeholders at National, Provincial and District levels, including the private sector. The Strategy will include institutional and operational arrangements for effective implementation and coordination.

7.1.1 Overall Coordination

The MFL and MCTI being in charge of aquaculture production and trade promotion, respectively, shall be the oversight institutions in coordinating the implementation of Strategy. The two lead ministries shall have a primary responsibility of providing an enabling environment to promote production and trade aquaculture and fisheries products through policy and legal guidance.

Specifically, MFL will provide technical expertise aimed at boosting production such as that of fish seed and fish feed, extension services and fishery legislation. On the other hand MCTI shall have a primary responsibility of providing an enabling environment to promote investment, trade through policy and legal guidance. MCTI will also facilitate aquaculture alliances among cooperatives in order to satisfy the local and regional markets. Additionally, MCTI will continue to negotiate for better market access conditions for fish and fish products at bilateral, regional and multilateral levels as well as facilitate trade through close collaboration with ZRA and other border agencies as well as cooperating partners.

7.1.2 Roles of Other Government Ministries and Agencies/Institutions

MFL and MCTI will closely work with other line Government Ministries and Institutions, the private sector, institutions of learning, and NGOs to promote the sector. Among the key implementing ministries and agencies, include the MNDP, MoA, NALEIC, CEEC, ZABS, ZCSA, ZDA, ZMA, ZEMA, WARMA, and ZSA among others. The specific roles of these institutions is as outlined below.

7.1.2.1 Ministry of National Development Planning

The MNDP will coordinate and engender consensus among fisheries and aquaculture stakeholders through the existing national coordination structures. MNDP will also provide support and coordinate monitoring and evaluation to ensure timely implementation, value for money and attainment of the set objectives as envisioned in the National Development Plans.

7.1.2.2 Ministry of Agriculture

The MoA will complement the role of the MFL of facilitating and supporting the development of a sustainable, diversified and competitive sector that assures food and nutrition security, increased incomes and contribute to poverty reduction.

7.1.2.3 Citizen Economic Empowerment Commission and other Financial Institutions

CEEC will provide enhanced business development services and linkages to the aquaculture sub-sector and finance through the Aquaculture Seed Fund. Other players include banks, insurance companies and other financial institutions.



7.1.2.4 Zambia Bureau of Standards

ZABS will provide efficient and effective standardisation and quality assurance of fish feed, fish seed and other products in order to contribute to the improvement of the quality of products and services.

7.1.2.5 Zambia Metrology Agency

ZMA through its mandate of designating, keeping, maintaining national measurement standards and prescribing the system of measurement units will have a responsibility to protect consumers, promote health, safety and environmental management through the provision of metrology services.

7.1.2.6 Zambia Compulsory Standards Agency

ZCSA will play a role of administering, maintaining and ensuring compliance with compulsory standards for the purpose of public safety and health, consumer and environmental protection.

7.1.2.7 Zambia Development Agency

ZDA will provide entrepreneurship and business development services and other support to micro and small-scale aquaculture business enterprises; promote exports and development of markets including market linkages at domestic level; and provide business information and market intelligence to the business community, and promote investment in the sector including promotion of establishments of aquaculture in the farm blocks.

7.1.2.8 Zambia Environmental Management Agency

ZEMA will ensure that all aquaculture undertakings have no effect on human welfare and the environment, through effective environmental management for present and

future generations. ZEMA will also participate in residue monitoring in fish and fishery products.

7.1.2.9 Water Resources Management Authority

WARMA will monitor and regulate water use by the aquaculture sub-sector to safeguard and equitably distribute the resource. Further, WARMA will ensure that there is no contamination over any water resources in Zambia through aquaculture practices.

7.1.2.10 Zambia Statistics Agency

ZSA will coordinate and provide timely, quality and credible official statistics on aquaculture development for use by Stakeholders.

7.1.2.11 National Livestock Epidemiology and Information Centre

NALEIC will be responsible for collecting data on animal health and production, disease and marketing events from the fisheries and aquaculture sub-sector. Further, NALEIC will be responsible for monitoring and controlling legal compliance and providing information to the fisheries and aquaculture sub-sector.

7.1.2.12 Other Key Institutions

The other key institutions that will participate in the implementation of the strategy are the Private Sector, Academia and Research Institutions, Business Associations, other Non-State Actors, Cooperating Partners, CSOs and NGOs. More specifically, these institutions will play the following roles and responsibilities:

(a) Private Sector: The private sector will be instrumental to the implementation of the strategy, through umbrella associations such as ADAZ. The private sector will be actively encouraged to participate in their respective Technical Working Groups (TWGs) and any other consultative meetings.



(b) Academia and Research Institutions:

Representatives from academia and research institutions such as the University of Zambia, Copperbelt University, Mulungushi University, Robert Makasa University, Kasaka Fisheries Training Institute, Indaba Agricultural Policy Research Institute, World Fish Centre, and Natural Resources Development College, will be encouraged to undertake research in aquaculture innovation and development.

(c) Cooperating Partners (CPs):

CPs such as IFAD, USAID, SIDA, EU and JICA will continue to collaborate with Government by providing technical and financial support through the existing NDP coordination structures.

7.2 Resource Mobilisation and Financing

7.2.1 Role of Government

The Government of the Republic of Zambia through the MoF shall be responsible for mobilising and allocating adequate resources to the Ministries, Provinces and Spending Agencies (MPSAs) for the implementation of the Strategy.

7.2.2 Role of Cooperating Partners

The Government Ministries, Agencies and Institutions will work closely with Cooperating Partners to mobilise financial resources and develop technical capacities needed for the growth of the sub-sector.

7.2.3 Role of the Private Sector

The Government through MFL, MCTI and other MPSAs will engage the private sector and other stakeholders in the mobilisation of resources through Public Private Partnerships (PPPs) and other financing modalities. Through PPPs, the Government will promote the development of the sector for enhanced economic growth and development.

7.3 Policy and Regulatory Framework

7.3.1 Policy Framework

The National Aquaculture and Fisheries Trade Development Strategy is anchored on various policies with focus on the aspiration of the 7NDP. These include:

- National Quality Policy (2010);
- National Aquaculture Strategy 2006;
- National Aquaculture Development Plan (2015–2020);
- National Industrial Policy (2018–2027);
- National Trade Policy (2018–2027);
- National Export Strategy (2018–2022);
- National Investment Promotion Strategy (2018–2022);
- National Local Content Strategy (2018–2022)
- SADC Regional Aquaculture Strategy and Action Plan (2016 – 2026);
- Second National Agricultural Policy (2016–2020);
- National Agriculture Investment Plan (2014–2018);
- Regional Water Policy (2005) for SADC;

7.3.2 Regulatory Framework

In Zambia, the Fisheries Act No. 22 of 2011 is the Principal Act, supplemented by the Fisheries Regulations No. 24 of 2012. This Act provides for the promotion of sustainable development of fisheries and a precautionary approach in fisheries management, conservation and utilisation, and the regulation of commercial fishing and aquaculture. However, other pieces of legislation affecting the fisheries sub-sector include:

- The Environmental Management Act (EMA) No. 12 of 2011;
- The Water Resource Management Act No. 21 of 2011;
- Local Government Act No. 2 of 2019;
- Biosafety Act No. 10 of 2007;

- Public Health Act Cap 295;
- Standards Act No. 4 of 2017;
- Zambezi River Authority Act No of 17 of 1987;
- Lands Act of 1995 (CAP 184);
- Zambia Wildlife Act No. 14 of 2015;
- Animal Health Act No. 27 of 2010;
- Food and Drugs Act Cap 303;
- Zambia Development Agency (ZDA) Act No. 29 of 2011;
- CEE Act No. 9 of 2006;
- Competition and Consumer Protection Act No. 24 of 2010;
- Cooperative Societies Act No. 20 of 1998; and
- The Plant Pests and Diseases Act No. 13 of 1994.

7.4 International Treaties

Zambia is a signatory to a number of international and regional conventions, treaties, and protocols that are related to the Fisheries and Aquaculture development. Some of the conventions relevant to fisheries and aquaculture sub-sector are:

- i. The Paris Agreement (2016) which aims to strengthen the global response to climate change by creating an international network of government bodies, all dedicated to lowering emissions.
- ii. The Convention on the Protection and Use of Trans-boundary Watercourses and International Lakes (2014) aims to ensure the sustainable use of trans-boundary water resources by facilitating cooperation for the protection and management of trans-boundary surface waters and ground waters.
- iii. The Kyoto Protocol (2005) aims at setting internationally binding emission reduction targets.
- iv. The Stockholm Convention on Persistent Organic Pollutants (2004) is meant to protect human health and the environment from some of the most dangerous

chemicals on earth. It calls on parties to eliminate the production of POPs, minimise unintentional sources, clean up and safely manage remaining stockpiles and waste.

- v. The Convention on Biological Diversity (1993) aims to develop national strategies for the conservation and sustainable use of biological diversity and the fair and equitable sharing of benefits arising from genetic resources.
- vi. The United Nations Framework Convention on Climate Change (1992) aims to stabilise greenhouse gas concentrations in the atmosphere at a level that prevents dangerous anthropogenic interference with the climate system.
- vii. The CITES Convention (1975) aims to encourage member states to be the best protectors of their wild flora and fauna; ensure that international trade in a variety of wild animals and plants does not threaten the survival of the species in the wild; and protects certain species of wild flora and fauna from over exploitation through international trade.
- viii. The Ramsar Convention (1971) provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources.

7.5 Monitoring and Evaluation

The Strategy shall be operationalised through the Implementation Plan (Annexed) over a period of five (5) years, from 2020 to 2024 and will be routinely monitored on a monthly, quarterly and annual basis with the Mid-Term Review in 2022. The Strategy will adopt a multi-sectorial approach with the MFL and MCTI as the principle institutions responsible for the Monitoring and Evaluation the implementation of the Strategy. The institutional and operational arrangements for implementation will be done through the existing coordination structures of the NDP.

Annex 1: Action Plan/Implementation Logframe for the National Aquaculture Trade Development Strategy 2020 - 2024



MINISTRY OF COMMERCE, TRADE AND INDUSTRY
MINISTRY OF FISHERIES AND LIVESTOCK

Overall Objective: To contribute to trade and market development through enhanced aquaculture and capture fisheries production and productivity for socio-economic development

Specific Objective 1: To increase sustainable fish production and Productivity of aquaculture and capture fisheries sub-sector.

Strategic Measure	Output /Target	Activities	Implementation Time Frame					Budget (K)	Source of Fund	Implementing Agencies/Institution	
			2020	2021	2022	2023	2024			Lead	Others
1.1 Promote production of diversified farmed-fish species	Kafue bream in the second generation of genetic improvement by 2024	i. Collection of the germplasm									
		ii. Crossing of different strains						250,000	GRZ/Partners	MFL	WFC/UNZA/NRDC
	At least two (2) species (Green-headed bream and Tanganyika bream) in the process of genetic improvement by 2023	i. Collection of the germplasm						300,000	GRZ/Partners	MFL	WFC/UNZA/NRDC
		ii. Disease screening						1,000,000	GRZ/Partners	MFL	WFC/UNZA/NRDC
		iv. Genetic characterisation									
		iii. Increasing the base population						100,000	GRZ/Partners	MFL	WFC/UNZA/NRDC
	African catfish production increased by at least 20% by 2024	i. Conduct baseline survey						400,000	GRZ/Partners	MNDP (ZSA)	MFL/IAPRI/WFC/Public Universities /NRDC/FAO/ADAZ
		ii. Sensitise farmers on the production and consumption of the African catfish									
		ii. Provide technical and financial support for artificial catfish breeding						420,000	GRZ/Partners	MFL	MoA/UNZA/ ADAZ
	At least 30 TOTs trained annually	iii. Set up demonstration sites at government fish farms/ lead farmers						4,000,000	GRZ/Partners	MFL	MCTI/CEEC/BANKS/ZDA/ZABS/NRDC
		i. Develop training modules/manuals for fingerling and catfish production						1,500,000	GRZ/Partners	MFL	Commercial Fish Farms
		ii. Conduct refresher courses for extension officers in tilapia and catfish production						200,000			
		i. Identify and select farmers to be trained						500,000	GRZ/Partners	MFL	Training Institutions
	At least 600 entrepreneurs trained in							-	GRZ/Partners	MFL	ZSA/WFC/IAPRI/ADAZ

Strategic Measure	Output /Target	Activities	Implementation Time Frame					Budget (K)	Source of Fund	Implementing Agencies/Institution	
			2020	2021	2022	2023	2024			Lead	Others
1.2 Enhance access to quality fish seed;	the aquaculture value chain annually	ii. Develop training materials/brochures						150,000	GRZ/Partners	MFL	Training Institutions/WFC/ADAZ
		iii. Conduct training						2,400,000	GRZ/Partners	MFL	UNZA/NRDC/ADAZ/CBU
		i. Sensitise hatcheries on broodstock and fingerling standards						250,000	GRZ/Partners	MFL	WFC/IAPRI/ADAZ
	At least two (02) hatcheries certified annually	ii. Facilitate adoption of standards in broodstock and fingerlings production									
		i. Identify and select hatchery operators to be trained						300,000	GRZ/Partners	ZABS	MFL/IAPRI/WFC/UNZA/NRDC/FAO/ADAZ
		ii. Conduct training in hatchery management						-	GRZ/Partners	MFL	UNZA/NRDC/ADAZ/CBU
1.3 Facilitate access to business development services by small and medium aquaculture entrepreneurs	At least five (5) existing hatchery operators trained annually	i. Conduct a survey on the national fingerling demand and supply						240,000	GRZ/Partners	MFL	UNZA/NRDC/ADAZ/CBU
		ii. Map the current suppliers by region and species						1,000,000	GRZ/Partners	MNDP (ZSA)	UNZA/NRDC/ADAZ/CBU
		iii. Conduct hatchery inspections						40,000	GRZ/Partners	MFL	UNZA/NRDC/ADAZ/CBU
	At least four (4) Fish farmer groups per district linked to business development service providers annually	i. Identify and map business development service providers						2,000,000	GRZ/Partners	MFL	ZABS/ZSA/Smart Zambia
		ii. Create business linkages across the aquaculture value chain						10,000	GRZ/Partners	MFL	Business development service providers
		i. Conduct needs assessment and identification of farmer groups						50,000	GRZ/Partners	MFL	Business development service providers
	At least (5) Fish farmer groups per district trained in Business Development Services annually	ii. Identify training service providers						500,000	GRZ/Partners	MFL	ZDA/ADAZ/WF
		iii. Conduct entrepreneurship training						-	GRZ/Partners	MFL	
								1,500,000	GRZ/Partners	MFL	Public Universities and Colleges/ADAZ



Strategic Measure	Output /Target	Activities	Implementation Time Frame					Budget (K)	Source of Fund	Implementing Agencies/Institution	
			2020	2021	2022	2023	2024			Lead	Others
1.4 Promote local feed production amongst small scale farmers	Operationalise three (03) land based and two (02) water- based Aquaculture Park by 2024	i. Build infrastructure (roads, buildings, cage fabrication workshops, cold rooms, jetty), Electrification, provide water and sanitation						100,000,000	GRZ/Partners	MHID	RDA/ZESCO/MLNR (WARMA)
		i. Establish automated registry of cooperatives by province						300,000	GRZ/Partners	MCTI	MFL/ADAZ
		ii. Conduct cooperatives needs assessment for aquaculture						500,000	GRZ/Partners	MCTI	MFL/ADAZ
	At least three (3) viable Cooperatives/famer groups venturing in aquaculture formed per province annually	iii. Facilitate establishment of two (2) aquaculture cooperatives per province						250,000	GRZ/Partners	MCTI	MFL/ADAZ/SMART Zambia
		i. Recruit additional aquaculture extension officers						65,000,000	GRZ	PSMD	MoF/MFL
		ii. Provide adequate transport/equipment						3,000,000	GRZ/Partners	MFL	MoF
	On farm fish feed production for small scale farmers increased by 30%	iii. Rehabilitation and construction of camp houses						3,000,000	GRZ/Partners	MFL	MoF
		i. Conduct a survey of locally available feed ingredients						1,000,000	GRZ/Partners	MFL	ADAZ
		ii. Build capacity of fish farmers in fish feed formulation						3,000,000	GRZ/Partners	MFL	ADAZ
		iii. Dissemination of information on access to						233,000	GRZ/Partners	MFL	ADAZ

Strategic Measure	Output /Target	Activities	Implementation Time Frame					Budget (K)	Source of Fund	Implementing Agencies/Institution	
			2020	2021	2022	2023	2024			Lead	Others
1.5 Promote sustainable exploitation of fisheries and good aquaculture practices	At least five (5) small scale fishery areas gazetted	simple and modern feed processing technologies									
		Conduct inventory of small scale fisheries						1,500,000	GRZ/Partners	MFL	IAPRI
	At least five (5) enforcement and surveillance patrols conducted each year	Gazetting process of the small scale fishery areas						500,000	GRZ	CABINET	MFL
		i. Undertake regular fisheries enforcement campaigns and surveillance missions									
	At least three (3) co-management committees formulated and/or strengthened annually per fishery area by 2024							5,000,000	GRZ/Partners	MFL	DNPW
		i. Establish a registry of existing co-management committees per fishery area									
		ii. Conduct needs assessment for co-management committees						450,000	GRZ/Partners	MFL	ZSA/IAPRI/WF
		iii. Facilitate formulation of co-management committees						500,000	GRZ/Partners	MFL	ZSA/IAPRI/WF
		iv. Capacity building of at least two (2) co-management committees per province						300,000	GRZ/Partners	MFL	ZSA/IAPRI/WF
								2,400,000	GRZ/Partners	MFL	MCTI/Training institutions



Strategic Measure	Output /Target	Activities	Implementation Time Frame					Budget (K)	Source of Fund	Implementing Agencies/Institution		
			2020	2021	2022	2023	2024			Lead	Others	
	Stock enhancement conducted in at least seven (7) fishery areas by 2024	i. Installation and stocking of pens in identified fishery areas										
	Three (3) frame and three assessment surveys conducted by 2024	Conduct frame survey							10,000,000	GRZ/Partners	MFL	UNZA/CBU
									3,800,000	GRZ/Partners	MFL	ZSA
		Conduct stock assessment survey										
	A dedicated environmental compliance and Monitoring Unit formulated under MFL by 2024	Develop an integrated environmental management system							1,200,000	GRZ/Partners	MFL	ZSA
		Enforcement of regulations that govern environmental monitoring						250,000	GRZ/Partners	ZEMA	MFL	
								960,000	GRZ/Partners	ZEMA	MFL/MLG	

Strategic Objective 2: To increase total export earnings through improved trade logistics and facilitation and access for fish and fishery products to domestic, regional and international markets

Strategic Measures	Output /Target	Activities	Implementation Time Frame					Budget (K)	Source of Fund	Implementing Agencies/Institution	
			2020	2021	2022	2023	2024			Lead	Others
(i) Enhance efficiency in domestic fish markets	Cost of marketing and post-harvest losses reduced by 5% annually	i. Undertake a study on domestic fish markets						500,000	GRZ/Partners	MCTI	MFL, IAPRI, UNZA, CBU
		ii. Conduct training in post-harvest activities						500,000	GRZ/Partners	MFL	MCTI, MDD, MOJ, MLG
(ii) Promote development of market infrastructure	At least ten (10) fish market infrastructure constructed by 2024	i. Undertake an infrastructure needs assessment and mapping exercise						800,000	GRZ/Partners	MHID	MFL, MWS, MNDP
		ii. Facilitate private sector-led market infrastructure developments						5,000,000	GRZ/Partners	MHI	MFL, ZDA, CEEC, COMESA, SADC
	Fish market infrastructure rehabilitated by 2024	i. Conduct rehabilitation of existing market infrastructure						2,000,000	GRZ/Partners	MFL	MHID, MLG, MWS
(iii) Improve access to regional and international markets	Capacity in fish quality standards and market requirements enhanced	i. Identify and select key stakeholders in the fish value chain						100,000	GRZ/Partners	MFL	MCTI, ZDA, ADAZ
		ii. Conduct training for 500 SMEs and other stakeholders						1,000,000	GRZ/Partners	MFL	ZABS, MOH, ADAZ, UNZA, NRDC, WF
		iii. Undertake routine monitoring and surveillance on fish quality standards and market requirements						800,000	GRZ/Partners	MFL	MCTI, ZABS, MOH, MLG
		i. Undertake market research						1,500,000	GRZ/Partners	MCTI	ADAZ, IAPRI, CEEC, UNZA, CBU, MULUNGUSHI UNIVERSITY
	Total Exports of Fish and fisheries products to grow by about 30% in real value annually.	ii. Provide market information to stakeholders in the fish value chain						150,000	GRZ/Partners	MFL	ADAZ, MCTI, IAPRI, MUSIKA



Strategic Measures	Output /Target	Activities	Implementation Time Frame					Budget (K)	Source of Fund	Implementing Agencies/Institution		
			2020	2021	2022	2023	2024			Lead	Others	
		iii. Undertake trade promotion missions/expos							10,000,000	GRZ/Partners	MCTI	MFL, MoA, MoTA, Provincial Administrations,
		iv. Enact the Trade Remedies Bill							50,000	GRZ/Partners	MCTI	Cabinet Office, MoJ, National Assembly
		v. Improve access to established markets and penetrate new markets							500,000	GRZ/Partners	MCTI	MFL, MFA, COMESA, SADC, AU
		vi. Promote market linkages							500,000	GRZ/Partners	MCTI	MFL, MFA, COMESA, SADC, AU
		vii. Enhance product diversification for exports										
									600,000	GRZ/Partners	MCTI	MFL

Specific Objective 3: To promote and increase investments in the aquaculture and capture fisheries Value Chain

Strategic Measures	Output /Target	Activities	Implementation Time Frame					Budget (K)	Source of Fund	Implementing Agencies/Institution	
			2020	2021	2022	2023	2024			Lead	Others
(i) Promote local and foreign direct investment to the sub-sector	At least two (2) Local and Four (4) Foreign Direct Investment (MNCs) set up in the aquaculture and fisheries sub-sector by 2024	i. Operationalize at least (5) aquaculture parks/ zones for aquaculture areas in strategic locations in the country.						150,000,000	GRZ/Partners	MCTI	MFL
		ii. Facilitate at least (5) sustainable energy infrastructure development projects in aquaculture parks						-	Private Sector	MFL	MOE/MCTI/ZDA/Private Sector
		iii. Facilitate fiscal and non-fiscal incentives (Taxes and Interest Rates).						-		MCTI	MOF/MFL/ Private Sector
		ii. Facilitate affordable financial and credit facilities to local actors						150,000,000	GRZ/Partners	CEEC	Commercial Banks/ZDA/Private Sector
		iv. Facilitate formation of joint ventures and partnerships between local and foreign investors.						-	GRZ/Partners	MCTI	MFL/Private Sector
		v. Promote investment in cold storage and processing facilities						-	GRZ/Partners	MCTI	MFL/Private Sector
(ii) Enhance value addition to fish and fishery products	Volume of processed fish increased by 20% of fish harvest by 2024	i. Build capacity in post-harvest loss management and product development						1,300,000	GRZ/Partners	MFL	UNZA, NRDC, WF
		ii. Provide modern and innovative technologies for value addition						2,000,000	GRZ/Partners	MFL	MCTI, UNZA, NRDC



Strategic Measures	Output /Target	Activities	Implementation Time Frame					Budget (K)	Source of Fund	Implementing Agencies/Institution																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																						
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		iii. Develop diverse processed fish and fishery products																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
		iv. Facilitate establishment of at least two (2) fish processing centres							2,000,000	GRZ/Partners	MFL	UNZA/NRDC																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
		Conduct training in fish value addition and linkages							5,000,000	GRZ/Partners	CEEC	MFL/PRIVATE SECTOR/UNZA/NRDC																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				

Specific Objective 4: To improve Capacity in Research and Development in the aquaculture and fisheries sub-sector

Strategic Measures	Output /Target	Activities	Implementation Time Frame					Budget (K)	Source of Fund	Implementing Agencies/Institution	
			2020	2021	2022	2023	2024			Lead	Other
(i) Improve research in aquaculture and fisheries value chain	At least three (3) scientific research papers published by 2024	i. Undertake innovative research in aquaculture and fisheries									
	At least two product-types developed (such as caviar and fish oil) by 2024	i. Undertake product development (applied research) ii. Sensitise and train stakeholders in the production of various fisheries and aquaculture products						575,000	GRZ/Partners	MFL	WF, UNZA, FAO, MOH (NFAC)
	At least two (2) indigenous fish species cultured by 2024	i. Conduct demonstrations/trials for potential culturable species ii. Undertake a study/research on potential fish species for aquaculture						575,000	GRZ/Partners	MFL	WF, UNZA, FAO, MOH (NFAC)
	At least one (1) on-farm training conducted by research institutions annually	i. Advocate for technical support in R&D for the aquaculture and fisheries actors						450,000	GRZ/Partners	MFL	MCTI
	At least one (1) R&D initiative and five (5) staff exchange visits undertaken annually	Develop a collaborative mechanism among research, training institutions and other stakeholders						502,000	GRZ/Partners	MFL	WF, UNZA, NRDC, CBU, MWEKERA FORESTRY
(iii) Strengthen institutional capacity to undertake R&D	At least two (2) seminars held by research institutions for aquaculture and fisheries actors annually	Conduct seminars to create linkages between research institutions for aquaculture and fisheries actors						413,000	GRZ/Partners	MFL	#REF!
	Five (5) R&D facilities rehabilitated and equipped by 2024	Rehabilitate and equip infrastructure for R&D institutions						582,000	GRZ/Partners	MFL	WF, UNZA, NRDC, CBU, MWEKERA FORESTRY
								225,000	GRZ/Partners	MFL	WF, UNZA, MCTI, CBU, NRDC
								300,000	GRZ/Partners	MFL	WF, UNZA, MCTI, NRDC, ADAZ, NRDC
								20,000,000	GRZ/Partners	MFL	MHID, MWS,



Specific Objective 5: To improve compliance to standards, technical regulation and certification of fish and fishery products

Strategic Measures	Output /Target	Activities	Implementation Time Frame					Budget [K]	Source of Fund	Implementing Agencies/Institution	
			2020	2021	2022	2023	2024			Lead	Other
(i) Ensure compliance to the domestic, regional and international legal framework that governs fisheries and aquaculture subsector	5,000 copies of IEC materials developed and distributed by 2023	i. Develop Information Education & Communication (IEC) materials on legal frameworks									
		ii. Conduct awareness campaigns on the available legal framework						250,000	GRZ/Partners	ZCSA	MWS, MIB, MFL, WF, MOJ, IAPRI
	At least one (1) spot check done per quarter per province	i. Develop compliance audit tool						423,000	GRZ/Partners	ZCSA	MIB, MFL, WF, MOJ, IAPRI
		ii. Conduct routine and spotcheck compliance inspections						500,000	GRZ/Partners	ZCSA	MFL, MOJ, MOH, MLGH,
	All institutions to start implementing SPS measures by 2024	i. Develop capacity for implementing SPS measures						1,100,000	GRZ/Partners	ZCSA	MOH, MFL
		Regulations and standards developed and implemented by 2023						200,000	GRZ/Partners	MFL	
(iii) Develop and strengthen the monitoring and surveillance system of compliance to standards, technical regulations and certification	Monitoring systems for compliance to standards and certification implemented by 2023.	i. Review/strengthen regulations and Standards governing aquaculture and fisheries sub-sector						1,500,000	GRZ/Partners	MFL	ZCSA, ZABS
		ii. Undertake stake holder sensitisation						500,000	GRZ/Partners	MFL	
	Develop tools for rapid residue detection, monitoring and surveillance	i. Develop tools for rapid residue detection, monitoring and surveillance									
		ii. Pilot monitoring tools						100,000	GRZ/Partners	MFL	UNZA, NRDC, MOH
	At least five (5) institutions implementing active surveillance by 2024	i. Develop the surveillance tools						250,000	GRZ/Partners	MFL	UNZA, NRDC, MOH
		iii. Provide support to institutions conducting active surveillance						300,000	GRZ/Partners	MFL	UNZA, NRDC, MOH
								500,000	GRZ/Partners	MFL	UNZA, NRDC, MOH

Strategic Objective 6: To enhance collaboration among stakeholders in the fisheries and aquaculture sub-sector.

Strategic Measures	Output /Target	Activities	Implementation Time Frame					Budget (K)	Source of Fund	Implementing Agencies/Institution	
			2020	2021	2022	2023	2024			Lead	Others
(i) Promote stakeholder engagements through established national coordinating structures	ICT Platform (such as SMS and Web based) established by 2022	Identify and select stakeholders						105,000	GRZ/Partners	MFL/MCTI	ADAZ
		Procure the SMS service platform from Service provider						325,000	GRZ/Partners	MFL	ZICTA, Mobile Service Providers
		Roll out the platform						450,000	GRZ/Partners	MFL	ADAZ
	One consultative meeting conducted at National level annually	Procure the Web platform from service provider						455,000	GRZ/Partners	MFL	ZICTA, SZI
		Identify & select stakeholders and provide them with user rights for the web platform						115,000	GRZ/Partners	MFL	ADAZ
(ii) Integrate fisheries activities in District and Provincial Development Planning and reports	Two consultative meetings conducted at Provincial level annually	Roll out the platform						500,000	GRZ/Partners	MFL	ADAZ
		Integrate the WBP into the National coordinating structure						200,000	GRZ/Partners	MFL	SZI
		Conduct an awareness meeting at National level						150,000	GRZ/Partners	MFL	ADAZ
	Two (2) consultative meetings conducted at District level annually	Conduct awareness meetings at provincial level						350,000	GRZ/Partners	MFL	ADAZ
		Develop M&E tool for fisheries and aquaculture sub-sector						500,000	GRZ/Partners	MFL	MNDP
Strengthen multi-sectoral coordination in monitoring and evaluation of the fisheries and aquaculture sub-sector	Monitoring and Evaluation tool on aquaculture and fisheries developed by 2022	Develop an information Management System database for progress tracking and reporting						350,000	GRZ/Partners	MFL	SZI
		Data Collection and Reporting						645,000	GRZ/Partners	MFL	MCTI, ZSA



Strategic Objective 7: To promote Public and Environmental Health in the Aquaculture and Fisheries Sub-sector.

Strategic Measures	Output /Target	Activities	Implementation Time Frame					Budget (K)	Source of Fund	Implementing Agencies/Institution	
			2020	2021	2022	2023	2024			Lead	Others
(i) Promote Food Safety in the aquaculture and fisheries value chain	Six Laboratories constructed and equipped at active border points by 2024	i. Construct laboratories						20,000,000	GRZ/Partners	MFL	MoH/MCTI/ZRA
		ii. Equip laboratories						10,000,000	GRZ/Partners	MFL	MoH/MCTI/ZRA
	Existing laboratories renovated and equipped regularly by 2024	i. Renovate laboratories						10,000,000	GRZ/Partners	MFL	MoH/MCTI/ZRA
	National food safety system for fish and fishery products developed by 2022	i. Undertake residue monitoring in fish and fishery products						800,000	GRZ/Partners	MFL	MoH/UNZA/NRDC
		ii. Develop the HACCP plans in aquaculture and fisheries						150,000	GRZ/Partners	MFL	ZABS/ZCSA/UNZA
(ii) Enhance disease surveillance in the aquaculture and fisheries value chain	Disease surveillance system set up by 2022	iii. Develop the Microbial and Chemical Risk Analysis in aquaculture and fisheries						150,000	GRZ/Partners	MFL	ZABS/ZCSA/UNZA
		iv. Domesticate the Biosafety Risk Analysis to aquaculture and fisheries						150,000	GRZ/Partners	MFL	UNZA
		i. Develop a surveillance plan for diseases						1,500,000	GRZ/Partners	NALEIC	MFL Training Institutions/WFC/ADAZ
		ii. Procure laboratory facilities for testing						10,000,000	GRZ/Partners	NALEIC	MFL Training Institutions/WFC/ADAZ
		iii. Undertake research and training in fish disease surveillance, prevention and management						5,000,000	GRZ/Partners	MFL	Training Institutions/WFC/ADAZ

Strategic Measures	Output /Target	Activities	Implementation Time Frame					Budget (K)	Source of Fund	Implementing Agencies/Institution	
			2020	2021	2022	2023	2024			Lead	Others
		i. Develop training materials									
		ii. Conduct training						250,000	GRZ/Partners	MFL	Training Institutions/WFC/ADAZ
		iii. Conduct countrywide sensitisation						2,400,000	GRZ/Partners	MFL	UNZA/NRDC/ADAZ/CBU
		i. Finalise the draft food safety bill and expedite the repealing and replacement of the food and drugs act cap 303 of the laws of Zambia						400,000	GRZ/Partners	MFL	Training Institutions/WFC/ADAZ
(iii) Strengthen the Public Health legal framework in the aquaculture and fisheries value chain	Food safety Bill enacted by 2022										
	At least Four (4) public health awareness activities on food safety conducted annually	Undertake public health awareness campaigns on the legal framework						-	GRZ	MoH	MFL/MoJ
								420,000	GRZ/Partners	MFL	MoH/MLGH

Strategic Objective 8: To promote and facilitate the formal trade of fish and fishery products



MINISTRY OF COMMERCE, TRADE AND INDUSTRY
MINISTRY OF FISHERIES AND LIVESTOCK

Strategic Measures	Output /Target	Activities	Implementation Time Frame					Budget (K)	Source of Fund	Implementing Agencies/Institution	
			2020	2021	2022	2023	2024			Lead	Others
(i) Enhance sector-specific legislations and policies that directly promote sustainable small enterprises;	Relevant Policy and Legislation/Regulations developed and reviewed by 2024	Review small enterprise development Act No 29 of 1996						300,000	GRZ/Partners	MCTI	Training Institutions/WFC/ADAZ/S takeholders
		Review MSME Development Policy						300,000	GRZ/Partners	MCTI	Training Institutions/WFC/ADAZ/S takeholders
		Review National Aquaculture Development Plan						300,000	GRZ/Partners	MFL	Training Institutions/WFC/ADAZ/S takeholders
		Development of Fisheries Policy						500,000	GRZ/Partners	MFL	Training Institutions/WFC/ADAZ/S takeholders
		Review of markets and bus stations Act No 7 of 2007						300,000	GRZ/Partners	MLG	MCTI
(iii) Strengthen interventions that promote compliance with formal business requirements such as registration and obtaining of various permits;	Businesses registered along the Aquaculture and fish value chain increased by at least 10% annually	Conduct a baseline survey for the formal and informal aquaculture and fish operators.						1,000,000	GRZ/Partners	MCTI	MFL, ADAZ, IAPRI, MUSIKA,
		Conduct awareness meetings on the benefits of formalising						400,000	GRZ/Partners	MNDP (ZSA)	MFL/IAPRI/WFC/Public Universities/NRDC/FAO/ADAZ
		Create a data base for formalised fish trade along the fish value chain						500,000	GRZ/Partners	MNDP (ZSA)	MCTI/MFL/IAPRI/WFC/Public Universities/NRDC/FAO/ADAZ

Strategic Measures	Output /Target	Activities	Implementation Time Frame					Budget (K)	Source of Fund	Implementing Agencies/Institution	
			2020	2021	2022	2023	2024			Lead	Others
	Formal trade compliance levels increased by 70% by 2024	IEC on compliance by enterprises									
	Online One Stop Center for application of permits developed and operationalized by 2024	Uploading and updating of information on fish trade to the e trade portal						100,000	GRZ	ZRA	MFL/PACRA
		Conduct awareness on fish trade requirements and processes							-	MCTI	MFL/MoH
								250,000	GRZ/Partners	MCTI	MFL



Strategic Objective 9: To mainstream cross-cutting issues along the Aquaculture and Fisheries value chain.

Strategic Measures	Output /Target	Activities	Implementation Time Frame						Budget (K)	Source of Fund	Implementing Agencies/Institution	
			2020	2021	2022	2023	2024	Lead			Others	
(i) Promote gender, disability and youth inclusiveness along the aquaculture and fisheries value chain;	Women and youth participation in the value chain increased by at least 40% and 20% for persons living with disabilities by 2024	Provide reservation schemes for women, youths and people living with disabilities along the value chain								GRZ/Partners	MFL	MCTI/MFL/IAPRI/WFC/Public Universities/NRDC/FAO/ADAZ
		Link women, youths and persons with disabilities to empowerment projects on fisheries and aquaculture							250,000	GRZ/Partners	MG	MCTI/MFL/IAPRI/WFC/Public Universities/NRDC/FAO/ADAZ
(ii) Reduce prevalence of child labour, HIV and gender-based violence among the operators in the fish value chain	At least one (1) sensitization activity on child labour, health and wellness and gender-based violence undertaken in each province annually	Conduct awareness across the fish value chain										MCTI/MFL/IAPRI/WFC/Public Universities/NRDC/FAO/ADAZ
		Collaborate with relevant institutions and other sectoral institutions to foster attitude change							500,000	GRZ/Partners	MFL	
(iv) Mainstream climate change mitigation and adaptation strategies in aquaculture and fisheries	Adopt climate smart practices at each stage across the value chain by 2024	Implement climate smart practices along the fisheries and aquaculture value chain							250,000	GRZ/Partners	MFL	MLSS, MOH, MHA
		Train farmers in best aquaculture practices e.g. recirculating aquaculture systems (Aquaponics)							2,000,000	GRZ/Partners	MNDP	MFL/MCTI/IAPRI/WFC/Public Universities/NRDC/FAO/ADAZ
												MNDP/MCTI/IAPRI/WFC/Public Universities/NRDC/FAO/ADAZ

Strategic Measures	Output /Target	Activities	Implementation Time Frame					Budget (K)	Source of Fund	Implementing Agencies/Institution	
			2020	2021	2022	2023	2024			Lead	Others
		Reduce external stressors on natural systems (Create awareness on sustainable fisheries and regulations)						1,000,000	GRZ/Partners	MFL	MNDP, ZEMA, ADAZ
		Identify and protect valuable fish areas (breeding grounds)						3,000,000	GRZ/Partners	MFL	WFC/National Parks and Wildlife, WARMA
		Disaster management across the fish value chain						500,000	GRZ/Partners	DMMU	MNDP/ UNDR
		Put in place early warnings and forecasting systems						500,000	GRZ/Partners	DMMU	MFL/ MNDP/ WFC
TOTAL ESTIMATED BUDGET								663,513,000			

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