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ALIGNMENT OF ZAMBIAN NAIP TO FISHERIES AND AQUACULTURE STRATEGIES AND INVESTMENT PLANS TO THE PFRS, ENVIRONMENTAL MANAGEMENT AND CLIMATE-CHANGE ADAPTATION ACTION PLANS.



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EXECUTIVE SUMMARY

Agriculture and agribusiness play an important role in Zambian economy, contributing around 20 percent of gross domestic product (GDP) in recent years and about 12 percent of national export earnings. Agriculture employs nearly 70 percent of the labour and remains the main source of income and employment for most of the people living in the rural areas.

The Comprehensive Africa Agricultural Development Programme (CAADP) is Africa's policy framework for agricultural transformation, wealth creation, food and nutritional security, and economic growth. At the launch of the CAADP in Malabo, AU-Heads of State committed themselves to reducing levels of poverty, ending hunger on the continent and tripling intra-African trade in agricultural goods, among others by 2025.

The main objective of this report is to highlight the following:

- Mainstreaming of fisheries and aquaculture in agriculture development plans and other national strategies;
- Mainstreaming of climate change in the national agriculture investment plans; and
- Alignment of agriculture investment plan to the policy framework and reform strategy (PFRS).

In order to achieve the above-mentioned objectives, the following steps were taken:

- Literature review: The literature reviewed for this assignment included the AU-IBAR PFRS; The Second National Agricultural Investment Plan (NAIP II); The National Policy on Climate Change; The Second National Agricultural Policy, National Policy on Environment, The Green Economy and Climate Change Act No. 18 of 2024, and other literature deemed appropriate for reference. The full list if presented in the references.
- Stakeholder engagement through one-on-one interviews and focus group discussions using workshops. The first workshop was held in September 2023, while the second one was a validation workshop held in June 2025
- SWOT analyses of the sector plans to identify the capacity to address climate risks; and mainstreaming of Case studies from Kenya, Republic of South Africa and Zambia as a way of learning

The main policy documents and development plans do refer to fisheries an important contributor to sector growth and attainment of the overall objectives but lack the depth to illustrate its importance. For instance, the conservation of biodiversity, which is importance for resilience is absent in the CATSP. Further, the plans do not have any clear strategy to address climate change risks.

The continued application of open access fisheries management approaches, coupled with uncoordinated catchment land use changes seem to also contribute to ever-declining fish stocks and habitat modification.

Recommendations are made to review and improve the representation of fisheries and aquaculture in the national development plans and strategies in respect of climate risk management. It is also recommended that during the implementation and subsequent review of the CATSP, efforts be made to align with the PFRS and CAADP compact.

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ACRONYMS

7NDP	Seventh National Development Plan
8NDP	Eighth National Development Plan
ADAZ	Aquaculture Development Association of Zambia
AfCFTA	African Continental Free Trade Area
AIDS	Acquired Immune Deficiency Syndrome
AU	African Union
AU-IBAR	African Union-Inter-African Bureau for Animal Resources
AU-MS	African Union Member States
AUC	African Union Commission
AWFISHNET	African Women in Fisheries Network
CAADP	Comprehensive Africa Aquaculture Development Program
CATSP	Comprehensive Agriculture Transformation Support Programme
CCA	Climate Change Adaptation
CEEC	Citizens Economic Empowerment Commission
COMESA	Common Market for Eastern and Southern Africa
CSA	Climate Smart Agriculture
DRC	Democratic Republic of Congo
DRM	Disaster risk management
DRR	Disaster risk reduction
EAA	ecosystem approach in aquaculture
EOMZ	Expansion of Oxygen minimum Zones
EU	European Union
FAO	Food and Agriculture Organisation
GCF	Green Climate Fund
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIS	Geographic Information System
GIZ	German International Development Corporation
GRZ	Government of the Republic of Zambia
HFCs	hydrofluorocarbons
HIV	Human Immunodeficiency Virus
IPCC	Intergovernmental Panel on Climate Change
IUU	Illegal unreported and unregulated
MAL	Ministry of Agriculture and Livestock
MCTI	Ministry of Commerce Trade and Industry
MDGs	Millennium Development Goals
MFL	Ministry of Fisheries and Livestock
MGEE	Ministry of Green Economy and Environment

MLNR	Ministry of Lands and Natural Resources
MS	Member States
MTENR	Ministry of Tourism, Environment and Natural Resources
NAIP	National Agricultural Investment Plan
NAMAs	Nationally Appropriate Mitigation Actions
NAP	National Adaptation Plan
NAPA	National Adaptation Programme of Action
NATDS	National Aquaculture Trade Development Strategy
NBSAP	National Biodiversity Strategic Action Plan
NCCRS	National Climate Change Response Strategy
NDC	Nationally Determined Contribution
NEPAD	New Partnership of Africa's Development
NFAP	National Fisheries and Aquaculture Policy
NGOs	Non-governmental Organisations
NPCC	National Policy on Climate Change
NPE	National Policy on Environment
NSAs	Non-State Actors
PFCs	perfluorocarbons
PFRS	Policy Framework and Reform Strategy for Fisheries and Aquaculture in Africa
RAIP	Regional Agricultural Investment Plans
RAP	Regional Agricultural Policy
RECs	Regional Economic Commissions
REDD	Reducing emissions from deforestation and forest degradation in developing countries
RSA	Republic of South Africa
SADC	Southern African Development Community
SPS	Sanitary and Phytosanitary
SWOT	strengths, weaknesses, opportunities and threats
UNFCCC	United Nations Framework Climate Change Conference
WWF	World Wide Fund for Nature
ZAEDP	Zambia Aquaculture Enterprise Development Project

GLOSSARY

Adaptation: In human systems, the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities. In natural systems, the process of adjustment to actual climate and its effects; human intervention may facilitate adjustment to expected climate.

Adaptive capacity: The combination of the strengths, attributes, and resources available to an individual, community, society, or organization that can be used to prepare for and undertake actions to reduce adverse impacts, moderate harm, or exploit beneficial opportunities.

Anthropogenic: Resulting from or produced by human beings.

Anthropogenic emissions: Emissions of greenhouse gases, greenhouse gas precursors, and aerosols associated with human activities. These activities include the burning of fossil fuels, deforestation, land use changes, livestock, fertilization, etc., that result in a net increase in emissions.

Baseline/reference: The baseline (or reference) is any datum against which change is measured. It might be a 'current baseline,' in which case it represents observable, present-day conditions. It might also be a 'future baseline,' which is a projected future set of conditions excluding the driving factor of interest. Alternative interpretations of the reference conditions can give rise to multiple baselines.

Capacity: The combination of all the strengths, attributes, and resources available to an individual, community, society, or organization, which can be used to achieve established goals.

Catchment: An area that collects and drains precipitation.

Climate: Climate in a narrow sense is usually defined as the average weather, or more rigorously, as the statistical description in terms of the mean and variability of relevant quantities over a period of time ranging from months to thousands or millions of years. The classical period for averaging these variables is 30 years, as defined by the World Meteorological Organization. The relevant quantities are most often surface variables such as temperature, precipitation, and wind. Climate in a wider sense is the state, including a statistical description, of the climate system. In various chapters in this report different averaging periods, such as a period of 20 years, are also used.

Climate change: A change in the state of the climate that can be identified (e.g., by using statistical tests) by changes in the mean and/or the variability of its properties and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forces, or to persistent anthropogenic changes in the composition of the atmosphere or in land use.

Climate extreme (extreme weather or climate event): The occurrence of a value of a weather or climate variable above (or below) a threshold value near the upper (or lower) ends of the range of observed values of the variable. For simplicity, both extreme weather events and extreme climate events are referred to collectively as 'climate extremes.'

Climate projection: A projection of the response of the climate system to emissions or concentration scenarios of greenhouse gases and aerosols, or radiative forcing scenarios, often based upon simulations by climate models. Climate projections are distinguished from climate predictions in order to emphasize that climate projections depend upon the emission/ concentration/radiative-forcing scenario used, which are based on assumptions concerning, 2 e.g., future socioeconomic and technological developments that may or may not be realized and are therefore subject to substantial uncertainty.

Climate scenario: A plausible and often simplified representation of the future climate, based on an internally consistent set of climatological relationships that has been constructed for explicit use in investigating the potential consequences of anthropogenic climate change, often serving as input to impact models. Climate projections often serve as the raw material for constructing climate scenarios, but climate scenarios usually require additional information such as about the observed current climate.

Climate variability: Climate variability refers to variations in the mean state and other statistics (such as standard deviations, the occurrence of extremes, etc.) of the climate at all spatial and temporal scales beyond that of individual weather events. Variability may be due to natural internal processes within the climate system (internal variability), or to variations in natural or anthropogenic external forcing (external variability).

Cold days/cold nights: Days where maximum temperature, or nights where minimum temperature, falls below the 10th percentile, where the respective temperature distributions are generally defined with respect to the 1971-2000 reference period.

Disaster management: Social processes for designing, implementing, and evaluating strategies, policies, and measures that promote and improve disaster preparedness, response, and recovery practices at different organizational and societal levels.

Disaster risk: The likelihood over a specified time period of severe alterations in the normal functioning of a community or a society due to hazardous physical events interacting with vulnerable social conditions, leading to widespread adverse human, material, economic, or environmental effects that require immediate emergency response to satisfy critical human needs and that may require external support for recovery.

Disaster risk management (DRM): Processes for designing, implementing, and evaluating strategies, policies, and measures to improve the understanding of disaster risk, foster disaster risk reduction and transfer, and promote continuous improvement in disaster preparedness, response, and recovery practices, with the explicit purpose of increasing human security, well-being, quality of life, and sustainable development.

Disaster risk reduction (DRR): Denotes both a policy goal or objective, and the strategic and instrumental measures employed for anticipating future disaster risk; reducing existing exposure, hazard, or vulnerability; and improving resilience.

Diurnal temperature range: The difference between the maximum and minimum temperature during a 24-hour period.

Downscaling: Downscaling is a method that derives local- to regional-scale (up to 100 km) information from larger-scale models or data analyses. The full definition is provided in Section 3.2.3.

Drought: A period of abnormally dry weather long enough to cause a serious hydrological imbalance. Drought is a relative term, therefore any discussion in terms of precipitation deficit must refer to the precipitation-related activity that is under discussion. For example, shortage of precipitation during the growing season impinges on crop production or ecosystem function in general (due to soil moisture drought, also termed agricultural drought), and during the runoff and percolation season primarily affects water supplies (hydrological drought). Storage changes in soil moisture and groundwater are also affected by increases in actual evapotranspiration in addition to reductions in precipitation. A period with an abnormal 3 precipitation deficit is defined as a meteorological drought. A megadrought is a very lengthy and pervasive drought, lasting much longer than normal, usually a decade or more.

Early warning system: The set of capacities needed to generate and disseminate timely and meaningful warning information to enable individuals, communities, and organizations threatened by a hazard to prepare and to act appropriately and in sufficient time to reduce the possibility of harm or loss.

Exposure: The presence of people; livelihoods; environmental services and resources; infrastructure; or economic, social, or cultural assets in places that could be adversely affected. Extreme weather or climate event: See Climate extreme.

Flood: The overflowing of the normal confines of a stream or other body of water, or the accumulation of water over areas that are not normally submerged. Floods include river (fluvial) floods, flash floods, urban floods, pluvial floods, sewer floods, coastal floods, and glacial lake outburst floods.

Governance: The way government is understood has changed in response to social, economic, and technological changes over recent decades. There is a corresponding shift from government defined strictly by the nation-state to a more inclusive concept of governance, recognizing the contributions of various levels of government (global, international, regional, local) and the roles of the private sector, of nongovernmental actors, and of civil society.

Greenhouse gas: Greenhouse gases are those gaseous constituents of the atmosphere, both natural and anthropogenic, which absorb and emit radiation at specific wavelengths within the spectrum of thermal infrared radiation emitted by the Earth's surface, by the atmosphere itself, and by clouds. This property causes

the greenhouse effect. Water vapor (H2O), carbon dioxide (CO2), nitrous oxide (N2O), methane (CH4), and ozone (O3) are the primary greenhouse gases in the Earth's atmosphere. Moreover, there are a number of entirely human-made greenhouse gases in the atmosphere, such as the halocarbons and other chlorine- and bromine containing substances, dealt with under the Montreal Protocol. Besides CO2, N2O, and CH4, the Kyoto Protocol deals with the greenhouse gases sulphur hexafluoride (SF6), hydrofluorocarbons (HFCs), and perfluorocarbons (PFCs).

Hazard: The potential occurrence of a natural or human-induced physical event that may cause loss of life, injury, or other health impacts, as well as damage and loss to property, infrastructure, livelihoods, service provision, and environmental resources.

Heat wave (also referred to as extreme heat event): A period of abnormally hot weather. Heat waves and warm spells have various and, in some cases, overlapping definitions. See also Warm spell.
Impacts: Effects on natural and human systems. In this report, the term 'impacts' is used to refer to the effects on natural and human systems of physical events, of disasters, and of climate change.

Insurance/reinsurance: A family of financial instruments for sharing and transferring risk among a pool of at-risk households, businesses, and/or governments. See Risk transfer.

Land use and land use change: Land use refers to the total of arrangements, activities, and inputs undertaken in a certain land cover type (a set of human actions). The term land use is also used in the sense of the social and economic purposes for which land is managed (e.g., grazing, timber extraction, and conservation). Land use change refers to a change in the use or management of land by humans, which may lead to a change in land cover. Land cover and land use change may have an impact on the surface albedo, evapotranspiration, sources and 4 sinks of greenhouse gases, or other properties of the climate system and may thus have radiative forcing and/or other impacts on climate, locally or globally.

Percentile: A percentile is a value on a scale of 100 that indicates the percentage of the data set values that is equal to or below it. The percentile is often used to estimate the extremes of a distribution. For example, the 90th (10 th) percentile may be used to refer to the threshold for the upper (lower) extremes.

Projection: A projection is a potential future evolution of a quantity or set of quantities, often computed with the aid of a model. Projections are distinguished from predictions in order to emphasize that projections involve assumptions concerning, for example, future socioeconomic and technological developments that may or may not be realized and are therefore subject to substantial uncertainty.

Resilience: The ability of a system and its component parts to anticipate, absorb, accommodate, or recover from the effects of a hazardous event in a timely and efficient manner, including through ensuring the preservation, restoration, or improvement of its essential basic structures and functions.

Runoff: That part of precipitation that does not evaporate and is not transpired but flows through the ground or over the ground surface and returns to bodies of water. See Hydrological cycle.

Scenario: A plausible and often simplified description of how the future may develop based on a coherent and internally consistent set of assumptions about driving forces and key relationships. Scenarios may be derived from projections but are often based on additional information from other sources, sometimes combined with a narrative storyline.

Streamflow: Water flow within a river channel, for example, expressed in m3 s-1 . A synonym for river discharge. Sustainable development: Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

Vulnerability: The propensity or predisposition to be adversely affected.

1. INTRODUCTION

Zambia is a landlocked country located in Southern Africa, lying between latitudes 8° and 18° South of the Equator and longitudes 22° and 34° East of the Greenwich Meridian. Zambia shares a common border with 8 other countries: Tanzania and the Democratic Republic of Congo (DRC) in the north; Angola in the west; Namibia, Botswana and Zimbabwe in the south, and Mozambique and Malawi in the east. The country has a total land surface area of 752,616 km², lying between 1,000 and 1,600 m above sea level. Zambia's main drainage systems are the Zambezi, Kafue, Luangwa and Chambeshi-Luapula rivers. The country has five major lakes: Kariba (man-made), Bangweulu, Mweru-Luapula, Mweru-Wantipa and Tanganyika. The rivers and lakes provide the country's most important water, fisheries and tourism resources.

The fisheries and aquaculture subsector contributes more than 3.2 percent to the Agricultural Gross Domestic Product (GDP) and provides the mainstay to over one million people in Zambia. This places the sector at the centre of the economic diversification and transformation agenda for the Government as it provides tremendous potential to contribute to economic growth. While the demand for fish has increased over the years due to increased human population and lifestyle preferences, the supply of fish has not matched this increase in demand. The National Agricultural Investment Plan (NAIP) under the Comprehensive Africa Agriculture Development Programme (CAADP) was developed to identify and prioritize key investments and policy changes needed to enhance agricultural productivity growth in Zambia in ways that will contribute to poverty reduction and inclusive economic growth.

The Comprehensive Africa Agriculture Development Programme (CAADP) is an initiative by African governments under the African Union/New Partnership for Africa's Development (AU/NEPAD) to accelerate growth and eliminate poverty and hunger among African countries. The main goal of CAADP is to help African countries reach a higher path of economic growth and achieve Millennium Development Goals (MDGs) through agriculturally-led development which eliminates hunger, reduces poverty and food and nutrition insecurity, and enables expansion of agricultural exports.

CAADP was designed and is fully owned and led by African governments, with the Common Market for Eastern and Southern Africa (COMESA) mandated to coordinate and harmonize CAADP implementation at national and regional levels. COMESA in its coordination and leadership role in CAADP implementation has guided in conformity with the broader principles of experience sharing and dialogue, mutual accountability, and partnership. The CAADP is centred around three pillars, namely, land and water management; rural infrastructure and Trade-related Capacities for Improved Market; increasing food supply and reducing hunger and; Improving agricultural research, technology dissemination and adoption.

In response to the CAADP and the commitments made under the Maputo declaration by African Union Member States (AU-MS), the SADC developed the 2010 Regional Agricultural Policy (RAP). The three pillars of the RAP were: Production, productivity and competitiveness; Trade and markets and; Financing and investments. The RAP is being implemented in phases of five-year cycles by way of Regional Agricultural

Investment Plans (RAIP). The first RAIP (2017 – 2022) was approved by SADC Council of Ministers in April 2017. The estimated budgetary requirements to implement the RAIP over the five-year period is estimated at US$1.3 billion.

The RAIP prioritized programmes for implementation during the five-year period and identifies the following five key programmes: Increased Agricultural Production, Productivity and Competitiveness; Increased Access to Markets and Trade of Agriculture Products; Increased Investments in and Access to Finance for Agriculture with the objective to support national efforts in promoting agri-business value chains, including agro-processing; and agricultural financing; Reduced Social and Economic Vulnerability in the Region which programme aims to reduce vulnerabilities in the agricultural sector brought about by climate change and variability; socio-economic factors such as gender inequality, HIV/AIDS and migration; and food insecurity in a changing economic environment. This programme will also address issues relating to disaster preparedness, response and recovery for food and nutrition security, water and energy; and Improved Food and Nutrition Security for the Region.

At national level, Zambia developed and implemented the first National Agriculture Investment Plan (NAIP) 2014-2018. The plan had four (4) pillars, which were: a) Sustainable natural resources management; b) Agricultural Production and Productivity Improvement; c) Market Access and Services Development; d) Food and Nutrition Security and Disaster Risk Management and; e) Crossing issues, which included gender, environment, decentralisation and other sector policies and plans. The NAIP, therefore, sort to enhance improved production and productivity in a market-oriented agricultural system. It also sought to enhance responsible utilisation of the land, water, fisheries and forestry resources in order to ensure sustainable growth of the agricultural sector.

After the elapsing of NAIP 2014-2018, the Zambian government developed the Comprehensive Agriculture Transformation Support Programme (CATSP), which, to all intents and purposes is NAIP II. The CATSP is designed to translate into action the will and commitment of the Government of the Republic of Zambia (GRZ) to implement an agriculture transformation policy, drawing lessons learnt from the implementation of NAIP I. The design of the CASTP is anchored on the following seven (7) strategic priorities, which are meant to strengthen the public sector to deliver services to create an enabling environment for the growth of the private sector.

At continental level, the African Union-Inter-African Bureau for Animal Resources (AU-IBAR) has developed instruments which aim to assist African countries, including Zambia, in mainstreaming fisheries and aquaculture and integrating climate change adaptation and mitigation measures into in development planning. These instruments provide guidance on sustainable fisheries management, climate-resilient aquaculture practices, and the protection of aquatic biodiversity in the face of climate change. They offer a framework for countries to strengthen their national policies, build technical capacity, and collaborate with regional and international partners to effectively address climate impacts on fisheries and aquaculture.

This report examines the alignment of Zambia's National Agricultural Investment Plans (NAIPs) to the Policy Framework and Reform Strategy (PFRS) and the integration of climate change adaptation and mitigation. It also examines the mainstreaming of fisheries and aquaculture, and recommends processes that can expedite the attainment of

2. METHODOLOGY FOR ASSESSING THE ALIGNMENT OF NAIPS TO THE PFRS

The methodology used to carry out this assignment was informed by the terms of reference (See appendix 1). The aim of the exercise was to assess the national and regional agricultural investment plans in respect of the following: a) Mainstreaming of fisheries and aquaculture; b) mainstreaming of climate change; and c) Alignment with the PFRS. In view of the above objectives, the following was done:

a. Literature Review

The object of this activity was to gather information on the policy framework strategies/plans guiding the development of fisheries and aquaculture in Zambia and the SADC region. This entailed assessing and identifying gaps in their alignment with the AU-AIBAR Policy Framework and Reform Strategy for Fisheries and Aquaculture in Africa (PFRS) and identifying opportunities for integration of the provisions of the PFRS into these instruments. The main documents reviewed were: a) Eighth National Development Plan (8NDP); b) National Agricultural Investment Plan (NAIP) (2014-2018); c) Comprehensive Agriculture Transformative Support Program (CATSP) (2022-2026); National Climate Change Response Strategy (NCCRS) -2010; d) National Fisheries and Aquaculture Policy (NFAP) (2023); e) National Policy on Climate Change (NPCC) (2016); f) National Adaptation Plan for Zambia (NAP-Zambia) (2023); g) SADC Regional Agriculture Policy (RAP) (2014); h) SADC Regional Agriculture Investment Plan (RAIP) (2023); Policy Framework and Reform Strategy (PFRS); and United Nations Framework Climate Change Conference (UNFCCC). Other literature reviewed include scientific publications and technical reports highlighting the impact of climate change on fisheries and aquaculture.

b. Stakeholder engagements

Engagements with key stakeholders were carried out at three (3) points.

i. One on one interview, where it was possible
ii. Workshop conducted in 2023
iii. Validation workshop conducted in 2025

The workshops had a cross-section of individuals representing both public and private sector interests in the fisheries and aquaculture sub-sector.

In the first workshop in 2023, the participants were drawn from the Ministry of Fisheries and Livestock, ADAZ, CEEC, University of Zambia, Worldfish, Creative Hands Association, Touching People's Lives – African Mission, KEMA consultants and various aquaculture practitioners. See Appendix 1a for the full list.

The second (Validation) workshop was drawn from Ministry of Fisheries and Livestock, FAO, WorldFish, GIZ, WWF, including COMESA, Ministry of Lands and Natural Resources (MLNR), Citizens Economic Commission (CEEC), University of Zambia, AWFISHNET, Yalelo, KEMA and Touching People's Lives- African Mission. Up to 31 persons were in attendance, representing the various entities (See Appendix Ib).

a. SWOT Analysis:

A SWOT Analysis was conducted, highlighting the Strengths, Weaknesses, Opportunities and Threats in relation to Climate Change adaptation and mitigation in the Fisheries and Aquaculture Sector. This was done to establish the capacity of the sector to management climate related risks, identify the gaps and existing opportunities to maximize in

b. Case Studies Compilation:

Two case studies were conducted. The first case study was the Kenya's National Climate Change Action Plan (2013-2017). The second case study was the South Africa's National Climate Change Response Strategy. These two were picked because they represented two different approaches from different Regional Economic Commissions (RECs).

c. Recommendations and Action Plan

Based on the findings from the review of Zambia's policies, strategies, and plans, the SWOT analysis, and documented case studies, a set of policy recommendations were drafted to strengthen the country's fisheries and aquaculture sectors. The recommendations are focused on improving policies, mobilizing resources, and promoting potential partnerships with national, regional and international organisations to enhance the alignment of Zambia's fisheries and aquaculture strategies with climate change adaptation priorities and the guidelines outlined in the Policy Framework and Reform Strategy for Fisheries and Aquaculture in Africa (PFRS) and other related instruments.

3. MAINSTREAMING OF FISHERIES AND AQUACULTURE IN NATIONAL PLANS AND STRATEGIES

Successive Zambian governments have recognised the importance of fisheries and aquaculture to their development agenda. This is evidenced by the inclusion of the sub-sector in development planning documents such as the Seventh National Development Plan (7NDP) (2017 – 2021), Eighth National Development Plan (8NDP) (2022 – 2026), National Agriculture Investment Plan (NAIP) (2014 – 2018) and the Comprehensive Agriculture Transformation Support Programme (CATSP) (2022 – 2026). Further evidence is seen from the establishment and maintenance of a ministry in charge of fisheries and livestock, away from agriculture, which tended to be dominated by crops, as well as the development of a stand-alone fisheries and aquaculture policy in 2023.

The fisheries and aquaculture sub-sector is also adequately represented in strategic documents such as the National Biodiversity Strategic Action Plan (NBSAP) (2015 – 2025), National Climate Change Response

Strategy (NCCRS) (2010) and the National Aquaculture Trade Development Strategy (NATDS) (2020 – 2022). These strategic plans highlight the potential of the sector to contribute to economic growth and some of the threats to fisheries and aquaculture as well as appropriate responses to address them.

4. MAINSTREAMING OF FISHERIES AND AQUACULTURE IN REGIONAL PLANS AND STRATEGIES

The SADC Regional Agricultural Policy (RAP) (2014) was developed with goal of the RAP is to stimulate sustainable agricultural development and food security in the region through a set of defined common agreed objectives that guide, promote and support actions at regional and national levels in the agricultural sector of the SADC member states. The RAP has three (3) core pillars as follows: Production, productivity and competitiveness; Trade and markets; and Financing and investments, with all three pillars supported by three cross-cutting factors, which are social, financial and institutional. The RAP is being implemented in phases of five-year cycles by way of Regional Agricultural Investment Plans (RAIP). The RAIP (2017 – 2022) prioritized the following five (5) areas:

a. Increased Agricultural Production, Productivity and Competitiveness whose key objectives are:
   - to attain regional food self-sufficiency in basic strategic commodities, increase incomes, reduce hunger and poverty in the short term; and
   - to assist Member States individually and collectively become major regional and global suppliers of selected strategic commodities
b. Increased Access to Markets and Trade of Agriculture Products whose key objective is to develop a conducive environment for the trade and marketing of agricultural products by improving the efficiency of regional input/output markets and stimulating broad farmers' participation in domestic, regional and international markets; improving the regional and international trade regulatory environment; and improving the development of agricultural marketing infrastructure;
c. Increased Investments in and Access to Finance for Agriculture with the objective to support national efforts in promoting agri-business value chains, including agro-processing; and agricultural financing;
d. Reduced Social and Economic Vulnerability in the Region which programme aims to reduce vulnerabilities in the agricultural sector brought about by climate change and variability; socio-economic factors such as gender inequality, HIV/AIDS and migration; and food insecurity in a changing economic environment. This programme will also address issues relating to disaster preparedness, response and recovery for food and nutrition security, water and energy; and
e. Improved Food and Nutrition Security for the Region with the key objective to generate, analyse and disseminate a varied range of information including information on vulnerability, malnutrition and food security, markets and trade; agro-meteorology; pests and diseases; among others. In addition, the programme focuses on providing data and information for monitoring and evaluation.

The RAP recognises fisheries for making a big contribution to the economies of the SADC member states, and that with increased demand if fish, the sector is faced with challenges, which include over-exploitation, environmental degradation and climate variability. Through RAIP, the SADC member states have committed

to addressing the afore-mentioned challenges.

According to the second generation RAIP (RAIP II) (2023 – 2030), the key challenges of implementation of RAIP were: Limited domestication of regional strategies at the national level; Inadequate disaster preparedness, particularly in the face of increasing frequency and intensity of climate-related events; Budgetary constraints, with reduced funding from Member States for programme implementation; and Limited visibility of regional agricultural initiatives at the national level. Therefore, RAIP II highlights ten (10) approaches to address these challenges, which include policy alignment and domestication; stakeholder engagement and inclusivity; resource mobilization and funding; capacity building and awareness; Institution strengthening; and Rural development and infrastructure. These approaches are expected to transform the agriculture sector (including fisheries and aquaculture) in the SADC member states.

5. CLIMATE RISKS AND IMPACTS IN FISHERIES AND AQUACULTURE

5.1 The Global Context

According to the Intergovernmental Panel on Climate Change (IPCC), climate change refers to a change in the state of the climate that can be identified by changes in the variability of its properties, and that persists for an extended period, typically decades or longer. Climate change may be due to natural internal processes or external forces such as modulations of the solar cycles, volcanic eruptions and persistent anthropogenic changes in the composition of the atmosphere (e.g. greenhouse gases) or in land use.

At the global level, the Earth's average surface temperature has increased by more than 0.8 °C since the middle of the nineteenth century, and is now warming at a rate of more than 0.1 °C every decade (Hansen et al., 2010). Heat waves are more frequent now, even though the reliability of data and level of certainty vary across continents (Hartmann et al., 2013). The largest contribution to this warming is believed to be from an increase in the atmospheric concentration of greenhouse gases (GHGs), which act like a thermal blanket around the planet and are responsible for allowing life on Earth to exist (IPCC, 2014).

The results of the global warming are predicted as: Rising Temperatures caused by absorption of heat by Oceans; Changes in ocean circulation patterns; Sea Level Rise caused by thermal expansion and melting glaciers and Ice caps; Ocean Acidification caused by Anthropogenic emissions of CO_2accumulate in the atmosphere; Ocean stratification caused by temperature and salinity differences (the layering of water at different temperatures); Reduced mixing and upwelling caused by altered wind patterns and ocean currents; Increased metabolic activity by marine organisms as result of warmer waters; Nutrient Runoff and Eutrophication caused by climate change; Expansion of Oxygen minimum Zones (EOMZ); Feedback mechanisms caused by deoxygenation; and Changes in ocean currents.

5.2 The National Context

Zambia is considered to be one of the countries in the world that is most vulnerable to climate change, ranking 26 out of 182 countries in the 2018 Global Climate Risk Index, and is classified as having high to extreme risk in the 2018 Climate Change Vulnerability Index2. Zambia has been experiencing climate change impacts in the form of rising temperatures, droughts, floods, and unpredictable rainfall patterns. The frequency and intensity of extreme climate events is expected to increase, posing significant risks to Zambia's economy, its people's livelihoods, and the sustainability of its natural resources base.

The change in temperatures is projected to increase by 3-5°C by 2100, with average precipitation declining during the early rainy season (October to December) and intensifying thereafter. Climate impacts were estimated to currently cost Zambia 0.4% of annual economic growth. Without proactive adaptive action, rainfall variability alone could cost up to 0.9% of GDP growth over the next decade, affecting the poor and most vulnerable, and holding a significant section of Zambia's population below the poverty line.

Zambia has over the past years experienced a number of climate related hazards including droughts and dry spells, seasonal and flash floods, and extreme temperatures. Some of these, especially droughts and floods have increased in frequency and intensity over the last two decades and have adversely impacted on food and water security, energy and livelihoods of communities. In the 2023/2024 rain season, Zambia experienced the worst drought, affecting 60% of the provinces. This resulted in low crop yields, loss of livestock due to starvation and low fish catches and subsequently, food prices increased beyond the reach of the many Zambians. Temperatures also indicate a rising trend with potential for increased heat stress, land degradation and desertification. These impacts are exacerbated by the limited capacity to respond to disasters, thus compounding the daunting economic and social challenges the country already faces.

Zambia therefore considers building climate resilience as critical for inclusive and sustainable development. Adaptation planning would enable Zambia to strengthen systems for integrating CCA into planning and budget processes, and also to develop prioritizing adaptation actions with financing strategies.

5.3 Climate Change Risks and Impacts on Fisheries and Aquaculture in Zambia

The climate change risks and impacts for Zambia's fisheries and aquaculture subsector, are listed as surface warming of rivers and lakes; changes in rainfall pattern; changes in cloud cover and wind speed; reduced water flows and increased droughts; reduced surface water availability; change in rainfall levels; increased frequency of floods and droughts; and less predictable rain and dry season. It is noteworthy that the predictability of these risks is difficult because of the interactions the water bodies have with other factors that could result in similar impacts..

Zambia has no climate change strategy specific to fisheries and aquaculture. However, the National Fisheries and Aquaculture Policy has highlighted climate change as a challenge to sustainable development of the subsector. There are also several national plans, legislations and strategies related to water and environment that have broadly identified the threat of climate change on fisheries and aquaculture either directly or indirectly. The following policies and strategies highlight the impact of climate change on fisheries and aquaculture:

a. National Fisheries and Aquaculture Policy (NFAP) (2022 – 2026)

The NFAP identifies Climate Change as a threat to sustainable fisheries and aquaculture production and productivity. However, the policy does not provide or prescribe climate change mitigation and adaptation measures. Thus, there will be a need for reviewing the policy to provide proper guidance.

b. National Adaptation Programme of Action (NAPA) (2002)

The NAPA recognises the fishing industry as a potential contributor to deforestation along the river banks and lakeshores as trees are cut to provide fuel for fish processing, necessitating the need for providing alternative technologies for drying fish.

c. National Climate Change Response Strategy (NCCRS) (2010)

The NCCRS highlights increasing temperatures and declining water levels during drought years as threats that cause reduced production, productivity and biodiversity due to modification and loss of habitats. Further, lower pH and nutrient availability will affect fish breeding and yields. Thus, the impact of climate change on fisheries and aquaculture are well articulated depending on the science at the time of development of the NCCRS.

d. National Policy on Climate Change (NPCC) (2016)

National Policy on Climate Change highlights the impact of higher temperatures and subsequent low fish production on food and nutritional security for Zambia. Although there is no elaborate explanation of how the temperatures relate to fish abundance, the policy integrates climate change adaptation into key sectors, including aquatic ecosystems. It promotes the conservation and sustainable use of water bodies, which indirectly supports fisheries by maintaining the health of freshwater ecosystems. The policy encourages actions to safeguard biodiversity, including aquatic life, which aligns with fisheries management objectives.

e. National Adaptation Plan (NAP) (2023)

As was the case with the NCCRS, the NAP highlighted climate related threats and vulnerabilities to the fisheries and aquaculture sub-sector. The plan further prescribed adaptation strategies. The vulnerabilities identified include loss of natural resources base; depletion of fish stocks; loss of functional capacity of the aquatic ecosystem and disruption of the input supply chain and finances, and the fishers and fish farmers have identified as the most affected.

f. The Nationally Determined Contribution (NDC) and National Adaptation Plan (NAP)

The Paris Agreement aims to strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty, including by: Each Party is expected prepare, communicate and maintain nationally determined contributions (NDCs) towards reducing Green House Gases (GHGs) emissions. Zambia's first NDC was submitted on 9th December, 2016, and consisted of both mitigation and adaptation components based on the country's national circumstances. Zambia's NDC was submitted with a conditional pledge of reducing Greenhouse Gas (GHG) emissions by 25% (20,000 Gg CO2 eq.) by 2030, and was revised in 2021. The revised NDC maintained the same target (25% emission reduction) but broadened the areas of interventions to include Agriculture, Livestock and Forestry. Fisheries

and Aquaculture were still considered insignificant contributors to GHG emission, but with the continued increase in the demand for aquacultural feeds, this status is likely to change.

In order to implement the NDC, Zambia developed the National Adaptation Plan, which highlighted the climate vulnerabilities, the country's adaptive capacity, Climate risk levels and Proposed adaptation actions. The following table is a summary of Zambia's adaptation plan for fisheries and aquaculture.

Table 1: *Climate change vulnerabilities, implications and adaptations for fisheries and aquaculture in Zambia's NAP*

Description of vulnerability	Exposure hazards	Implications	Adaptive Actions
Droughts	• Loss of the natural resource base (land, ecosystems, pasture, water sources, forests) • Extreme temperatures causing surface warming of lakes, rivers, and ponds • Loss of fish and wildlife habitats due to water recession	• Habitat modification • Low fish yields • High mortality rates • Loss of biodiversity • Disease outbreaks triggered by stress on fish • Loss of hydropower generation capacity	• Implement climate-smart technologies • Use climate-resilient rearing systems • Install heat-repellent shades • Establish early warning systems in collaboration with stakeholders • Develop and promote drought resistant • Promote green energy • Promote multi-sectoral catchment management • Develop climate insurance schemes
Floods	• Disruption of water quality • Destruction of aquaculture facility • Loss of fish breeding sites • Increased water levels	• Habitat loss • Inundation of ponds • Loss of fish from ponds • Low fish yields • Biodiversity loss • Displacement of households • Loss of household incomes • Habitat loss (biodiversity)	• Adapt to climate-smart resilient technologies • Strengthen monitoring of water quality and ecosystem health • Enhance research capacity • Develop and implement water conservation strategies
Increased temperatures	• Increased prevalence of fish diseases • Biodiversity loss (high altitude wetlands) • Disruption of migratory patterns • Frequent fish kills • Loss of wildlife to heat strokes	• Frequent fish kills • Loss of household incomes • Loss of fish stocks Compromised health	• Development of Early warning system and technical capacity to undertake risk assessment • Develop climate smart technologies

5.4 Mitigation of Climate Risks in Fisheries and Aquaculture

Based on the climate change risks and impacts identified above, the specific biophysical impacts on fisheries and aquaculture, their implications, and proposed mitigation measures are summarised in the table below

Table 2: *Climate change risks and mitigation measures for fisheries and aquaculture in Zambia*

Drivers	Biophysical Impacts	Implications	Proposed Risk Mitigation Measures
Changes in surface water temperature	• Increased pH levels with rising temperatures • Reduced dissolved oxygen due to algal blooms • High fish mortality rates in unsuitable temperatures	• Decline in fish health and productivity • Reduced aquaculture yields • Environmentally induced fish kills • Increased fish disease burden	• Monitor and regulate water temperature in aquaculture systems • Promote adaptive fish farming techniques suitable for varying temperatures. • Research and development on heat-tolerant species
El Niño-Southern Oscillation	• Increased pH levels with rising temperatures • Reduced dissolved oxygen due to algal blooms • Disruption in fish migration patterns • High fish mortality rates in unsuitable temperatures	• Disruption of fish farming cycles • Increased vulnerability of native fish • Reduced fish landings	• Develop early-warning systems for temperature variations • Implement resilient aquaculture practices.
Rising sea level	N/A		
Higher inland water temperatures	• Increased pH levels with rising temperatures • Reduced dissolved oxygen due to algal blooms • High fish mortality rates	• Reduced inland fish production • Stress on aquatic ecosystems	• Enhance riparian vegetation to mitigate heat • Develop thermal-tolerant fish species.
Changes in precipitation and water availability	• High runoff causing sedimentation • Altered habitats affecting aquatic life • Migration of fish due to water level changes	• Habitat degradation • Displacement of fish species • Reduced fish stocks	• Implement sediment control measures • Protect and restore critical aquatic habitats
Increase in frequency and/or intensity of storms	• Disruption to aquaculture infrastructure • Loss of fish stocks • Disruption of fishing activities	• Low aquacultural production and productivity • Compromised food and nutritional security	• Strengthen aquaculture infrastructure to withstand extreme weather events. • Establish effective early warning systems • Establish climate insurance schemes
Drought	• Decreased Water quality • Decreased water availability	• Crop failure • Loss of fish habitats • Stress on fish health and productivity • Reduced availability of water for aquaculture	• Implement water conservation practices • Develop and promote climate smart technologies • Establish insurance schemes

The PFRS advocates for and emphasizes the need for mainstreaming climate change in fisheries and aquaculture. Zambia has mainstreamed climate change in the NAIP and CATSP. The two highlight climate change as challenges but do not have specific strategies to clearly identify mitigate against the climate risks for fisheries and aquaculture. Therefore, there seems to be more of adapting to the risk than mitigating against the risks related to climate change.

6. CLIMATE CHANGE AND THE NATIONAL AGRICULTURE INVESTMENT PLAN

Climate change has been highlighted as a threat to growth and development of fisheries and aquaculture in many Zambian policy and development plans. Some of the impacts of climate change have been identified as habitat modification, loss of biodiversity and reduced productivity as a direct result of surface water warming, droughts and flooding. In section x, the following is stated: "Climate change and climate variability mitigation strategies for capture fisheries: The strategic objective is to generate information on climate parameters that can be utilized to advise on preparedness for mitigating the effects of climate change or climate variability in relation to the exploitation of fishery resources. To realize this objective, a number of interventions will be carried out, the key ones being: establishing 60 climate change early warning data collection points as well as 100 water level monitoring points in each fishery. In addition, a total of 15 climate change awareness workshops will be conducted. Given the complex nature of climate change issues, a strategy to develop human and infrastructure predictivity and modelling capacity will be part of the key activities under this subcomponent."

For aquaculture, the NAIP identified application of aquaculture regulation to ensure best aquaculture practices and establishment of water quality monitoring system for both pond and cage fish farmers. The plan also proposes the use of aquaculture generated quality fingerlings to enhance capture fisheries stocks. A total sum of US$92 million was allocated for the development of fisheries and aquaculture for 2014-2018 period of NAIP I.

In the CATSP, climate change is presented as a challenge to the agricultural sector, without necessarily breaking it down to the fisheries and aquaculture subsector. The program also commits to ensure disaster preparedness for the crops, livestock and fisheries subsector. However, without indicating what strategies are being stipulated for the fisheries and aquaculture subsector, it is difficult to make a clear assessment. Hence, there seems to be a gap in terms of alignment to the PFRS. It would, therefore be important for the government to develop a fisheries and aquaculture climate change strategy, which will highlight the climate risks, and mitigation and adaptation measures. The following table presents a summary of the specific provisions of relevance to climate change in fisheries and aquaculture.

Table 3: *Specific references made to climate change in NAIP and CATSP*

Name and Reference of Document	Quote what document states on climate change in the sector (e.g. nothing, only mentions 'climate change under sections…., page#)	Remarks if any
NAIP I	The NAIP highlighted the vulnerabilities of the agricultural sector to climate change and the need for necessary interventions as follows: (2.2.4) Zambian CAADP Compact (2.3.1.3) Lessons learnt (under Low agricultural productivity main as a result of poor technological adoption) (2.3.3.1.3) Lessons Learnt (under good management of pasture) (2.3.3.2.2) Challenges (under low adoption of improved tillage method and intercropping (2.3.5) Service Delivery Systems and Institutional Capacity (3.3) Sustainable Natural Resources Management Programme - Promote Land-use Planning, Administration and Management	The NAIP endeavoured to incorporate climate change in policy formulation in order to ensure mitigation and adaptation for the agricultural sector. This is also depicted in the finacing component of the plan and the M & E framework of the plan. Thus said, it can be concluded that the NAIP in general mainstreamed climate change.
CATSP (NAIP II)	In the CATSP (NAIP II), climate change is specifically referred to in the following areas (1.4.1) Sector opportunities - Climate adaptation (1.4.2) Critical sector constraints - Other production related factors responsible for low productivity (3.4.1) Investment Area 4.1 Promoting the adaptation, development and dissemination of CSA technologies. (PII.6.1.3) Provision of Subsidized Disaster Insurance Products	By recognising climate change as a major challenge with significant potential negative impacts, sought draw attention to this phenomenon. The programme has emphasised on the use of climate-smart technologies in order to enhance mitigation and adaptation capacity of the agriculture sector. However, it is not easy to tell how much of the budget was allocated to climate change related interventions.

6.1 Climate Change Gaps in the CATSP

The CATSP is Zambia's framework for attaining sustainable agricultural growth in line with the Comprehensive African Agricultural Development Plan. Climate change has been identified as one of the major threats to the attainment of growth across the three subsectors, namely, crops, livestock and fisheries. It is, therefore important that Zambia begins to build the necessary capacity to be able to mitigate against and adapt to the changing climate.

While there seems to be some clear actions aimed at addressing climate change challenges for crops and livestock, there seems to be lacking of similar strategies for fisheries and aquaculture. Fish is extremely vulnerable to changing environments, which can be triggered by climate variabilities. Increased temperatures, altered river flows, loss of breeding sites and flooding are some of the devastating events that can easily decline the capture fisheries and disrupt growth of aquaculture in Zambia.

In view of the above, the following conclusions and actionable recommendations are provided:

i. There is a need to develop, in a consultative and participatory manner, a fisheries-specific climate change strategy that clearly indicate how stakeholders will play roles to mitigate and adapt to climate change;
ii. There is inadequate application of ecosystem approaches in operations of the four main components of agriculture, namely, crops, livestock, fisheries and forestry.
iii. As a strategic plan, the CATSP needs to address all the identified risks in order to achieve the goals of the sector

6.2 Recommendations for Addressing Climate Change Gaps in Fisheries and Aquaculture

a. Integrate Fisheries and Aquaculture into Climate Change Policies

Actions:

- Include fisheries and aquaculture specific strategies and innovations for addressing climate challenges faced by both fish farming and fishing communities
- Develop strategies that will address post-harvest losses related to climate change
- Ensure climate adaptation strategies address the unique vulnerabilities of these sectors.

Expected Outcomes:

- Tailored measures for the fisheries sector, enabling targeted interventions for climate resilience.
- Enhanced sustainability and protection of livelihoods along fisheries and aquaculture value chains.

b. Integrate Sector-Specific Adaptation Measures

Actions:

- Develop and implement strategies to mitigate the effects of changing water temperatures, altered river flows, and impacts on fish habitats.
- Promote climate-resilient aquaculture practices and technologies, such as farming temperature-tolerant fish species, adopting water-efficient systems and educating sector players on the vulnerabilities.

Expected Outcomes:

- Reduced vulnerability of fisheries and aquaculture to climate-induced challenges.
- Improved sustainability and productivity of aquatic ecosystems despite climatic changes.

c. Strengthen Institutional Capacity

Actions:

- Provide training and capacity-building programs for government agencies, local communities, and fisheries managers on climate-resilient practices and policies.
- Develop institutional frameworks prioritizing climate adaptation in fisheries and aquaculture planning and implementation.

Expected Outcomes:

- Enhanced ability of stakeholders to implement effective climate-resilient measures.
- Strengthened governance and management of fisheries and aquaculture in response to climate challenges.

d. Strengthen Monitoring, Data Collection, and Research on Climate Vulnerabilities

Actions:

- Enhance research capacity and monitoring systems to assess current and future climate change impacts on fisheries and aquaculture.
- Establish and operationalize monitoring systems to track climate impacts on aquatic ecosystems, fisheries resources, and socio-economic indicators.
- Collaborate with research institutions and regional bodies to collect, analyze, and share climate-related data.

Expected Outcomes:

- Data-driven decision-making to inform adaptive management strategies.
- Availability of high-quality, timely data for evidence-based policies and interventions.
- Improved understanding of climate impacts, enabling proactive responses to emerging risks.

e. Promote Climate-Smart Aquaculture Practices

Action:

- Encourage adoption of climate-resilient aquaculture systems, such as thermal-tolerant fish species, submerged aquaculture systems, water conservation techniques, and infrastructure designed to withstand extreme weather events.

Expected Outcomes:

- Long-term viability of aquaculture through reduced climate-induced losses.
- Enhanced productivity and resilience in aquaculture operations.

f. Protect and Restore Aquatic Ecosystems

Actions:

- Implement measures to restore and protect critical aquatic habitats, including wetlands, rivers, and mountain sponges, from degradation, drought, and changing precipitation patterns.
- Establish fisheries sanctuaries, reserves and key biodiversity areas in all ecologically sensitive areas

Expected Outcomes:

- Healthy ecosystems that support fish populations and biodiversity.
- Stable foundation for sustainable fisheries and aquaculture.
- Natural gene banks in around the country

g. Enhance Stakeholder Collaboration and Capacity Building

Action:

- Promote collaboration between government agencies, research institutions, and local communities to build capacity for climate-resilient fisheries management.
- Establish a multidiscipline climate change research and response technical team
- Establish

Expected Outcome:

- Strengthened institutional capacity and stakeholder engagement.
- More effective climate adaptation strategies for fisheries and aquaculture.

h. Develop Early Warning Systems for Climate Risks

Action:

- Establish or enhance early warning systems to address climate impacts on fisheries, providing timely information on temperature fluctuations, droughts, and extreme weather events.
- Establish digital climate information platforms

Expected Outcome:

- Improved preparedness and rapid response to minimize risks to fish populations and aquaculture infrastructure.
- Improved safety for the fishing communities in weather-related disaster-prone areas

i. Promote Regional Cooperation

Actions:

- Establish collaboration agreements with neighboring countries and regional bodies like SADC and AU-IBAR for knowledge exchange, resource sharing, and best practices in climate adaptation.

Expected Outcomes:

- Improved resilience in fisheries management through regional cooperation.
- Greater adoption of sustainable practices and enhanced capacity to address transboundary climate challenges.

j. Leverage Funding Opportunities

Action:

- Develop and submit proposals to climate financing mechanisms such as the Green Climate Fund (GCF) and the Adaptation Fund to secure funding for climate-resilient fisheries projects.

Expected Outcomes:

- Secured financial resources for implementing climate adaptation measures (to date, the fisheries and aquaculture sector in Zambia has not benefited from such funding).
- Development of climate-smart infrastructure, enhanced research capabilities, and support for small-scale fishers and fish processors to adapt to climate impacts.

7. ALIGNMENT OF ZAMBIA'S NATIONAL AGRICULTURAL INVESTMENT PLAN (NAIP) TO THE POLICY FRAMEWORK AND REFORM STRATEGY (PFRS)

This is an assessment of the alignment of the National Agricultural Investment Plan (NAIP) to the Policy Framework and Reform Strategy (PFRS). The assessment focused on strategies and investment areas of the NAIP (2014-2018) and Comprehensive Agriculture Transformation Support Programme (CATSP), which is also referred to as the second generation NAIP (NAIP II).

While the NAIP and CATSP addressed various agricultural priorities, this assessment highlights areas where fisheries and aquaculture are specifically included, assumed, or absent, and explores opportunities for integration to enhance alignment with the PFRS. The findings will inform strategic recommendations to promote sustainable fisheries and aquaculture practices, strengthen value chains, and support Zambia's broader goals of food security, biodiversity conservation, and climate change resilience.

The assessment was conducted in a workshop environment, with participants requested to analyse the NAIP and CATSP and determine level of alignment to the PFRS. Both the NAIP and CATSP were considered for the assessment because, while NAIP lapsed in 2018, CATSP has just had the legal framework for its implementation finalized. Table XX is the summary of the assessment of the alignment. The full scoring of the alignment of the is presented in Appendix 1.

Table 4: *Assessment of the NAIP alignment to the PFRS*

Policy area	NAIP/CATSP Alignment with PFRS
Policy Area 1: Sustainable Fisheries and Aquaculture Management	a) NAIP (2014-2018): Challenges for capture fisheries are; High catchment water degradation; Low fisheries and aquaculture; research; Limited access to resources (Low budgetary allocation); High demand for fish resulting in increased fishing pressure; Decline in per capita fish supply from 1970s to 2000s; Low access to land for aquaculture. The following interventions are proposed: Improved input supply (fingerlings, feed); Improved feed availability; Enhanced use of native species for aquaculture; Policy change to address emerging issues; Stakeholder participation in fisheries management; Enhanced marketing b) The CATSP approach is commodity based and identified tilapia, catfish, kapenta and bukabuka as priority for the fisheries and aquaculture subsector. The program also prescribes fisheries management measures, such as the protection and management of fish breeding areas; combating illegal unreported and unregulated (IUU) fishing; establishment of aquaculture parks; and enhanced regulation of aquaculture in Zambia.
POLICY AREA 2: Small-Scale Fisheries Development	a) The fisheries in Zambia are largely small-scale in nature. Therefore, all interventions are aimed at addressing and developing this category of fisheries. NAIP promotes sustainable development of small-scale fisheries by promoting collaborative management of the fisheries to ensure sustainability. b) The CATSP highlights growing aquaculture production on the backdrop of stagnating capture fisheries Among the priority commodities targeted in the programme include Kapenta (Clupeids) and Buka buka (Lates stappersi), which are capture fisheries based.

Policy area	NAIP/CATSP Alignment with PFRS
POLICY AREA 3: Sustainable Aquaculture Management	a) Challenges for aquaculture in the NAIP included: low production and productivity; limited access to quality fish seed and feeds; limited access to land for pond aquaculture; limited access to finance. The interventions proposed include: improved access to fish seed and feed; improved access to finance; promotion of cage fish farming; enhanced access to land for aquaculture b) In CATSP, emphasis is on creating an enabling environment for regulation of aquaculture and improving access to markets within and without the country as well as improving competitiveness
POLICY AREA 4: Responsible and Equitable Fish Trade and Marketing	a) In Section 3.5 of the NAIP two policy objectives were elaborated as follows: (i) To create an enabling environment that will facilitate an efficient supply of agricultural inputs, increase private sector participation and improve the functioning of markets", and; (ii) "To improve the quality and enhance the competitiveness of potential agricultural exports in order to fully utilize markets (regional and international) thereby increasing agricultural contribution to foreign exchange earnings". In order to achieve these objectives, the plan proposed four components, namely;(i) Support institutional market arrangements and performance; (ii) Increase access to rural and market infrastructure; (iii) Increase access to rural finance, and; (iv) Promote value chain integration. b) The CATSP is largely advocating for market-oriented agriculture with emphasis on creating an enabling environment for application of standards and SPS services. The program propagates the establishing of a robust market system, which includes regulated aggregation and marketing among the food systems to enhance maximum profitability for the farming community.
POLICY AREA 5: Regional and Sub-Regional Cooperation	a) In the NAIP the opportunities offered by membership to regional and sun-regional bodies, and their markets are recognised and proposals are made to enhance market access within SADC and COMESA. The plan also seeks to promote the application of standards for competitiveness and provision of Sanitary and Phytosanitary (SPS) services to ensure food safety. b) In the CATSP, membership to groups such as the African Continental Free Trade Area (AfCFTA), SADC and COMESA is recognised as important in enhancing access to regional and subregional markets.
POLICY AREA 6: Awareness Enhancing and Human Capacity Development	a) The NAIP has provision for training support for extension support staff through the established Farmer training centres and Farmer training institutes. There are also provisions for accreditation of laboratories. There are no provisions for accreditation of professionals or mechanisms for effective information sharing between policymakers and stakeholders, although the existence of stakeholder groups is acknowledged. The NAIP provides for improvement of fishers' skills and capacities in fish processing. b) The CATSP has provisions for the accreditation of laboratories but not professionals or the creation of a mechanism for bringing together stakeholders for information sharing, and has a clear statement of intent to enhance skills-based training for the youth.
POLICY AREA 8: Cross-Cutting Issues in African Fisheries and Aquaculture	a) The NAIP highlighted the impact of cross-cutting issues such as climate change and gender and provides for their inclusions in the agriculture sector. However, there are no clear fisheries strategies to address climate change risks in the long term. The NAIP also emphasises the role of private sector participation in the agriculture sector. b) The CATSP is largely private sector driven. Two of the pillars of the CATSP are: (i) Enhancing Gender Equity and Women Empowerment in Agri-Food Systems, aimed at providing women agro entrepreneurs with positive discrimination services, such as trainings, business development support, fund raising, etc. and (ii) Promoting modernization of agriculture to enhance youth's participation. The aim is to foster youth's inclusion into the 3As, by providing services such as trainings, business development services, fund raising. However, the CATSP does not have provisions for fisheries-specific climate change strategies

7.1 Recommendations for Aligning the Second National Agricultural Investment Plan (NAIP) with PFRS

The proposed recommendations for aligning Zambia's Second National Agricultural Investment Plan (NAIP II) also named as Comprehensive Agricultural Transformation Support Program (CATSP), with the PFRS aim to promote sustainable development, strengthen food security, and meet regional and global commitments, including the Comprehensive Africa Agriculture Development Programme (CAADP). These recommendations highlight the critical importance of aligning the CATSP to the PFRS; integrating fisheries and aquaculture in the agriculture sector development agenda and mainstreaming climate change in development planning. A comprehensive Monitoring and Evaluation (M&E) framework is also being proposed to ensure that, alongside the implementation of these plans, a robust system is in place to track progress, enhance transparency, and support evidence-based decision-making. By institutionalizing M&E systems, incorporating CAADP-aligned indicators, adopting modern technologies, and engaging stakeholders, Zambia's fisheries and aquaculture sector can make meaningful contributions to national development while ensuring accountability and long-term sustainability. Following are recommendations for aligning the CATSP to the PFRS:

a) Policy Area 1: Sustainable Fisheries and Aquaculture Management

Recommended Actions:

- Promote and implement ecosystem approaches in fisheries and aquaculture
- Establish rights-based fisheries management regimes
- Establish budget provisions to support research and development for sustainable fisheries and aquaculture.

Expected Outcomes:

- Increased recognition and investment in sustainable fisheries management.
- Improved resource allocation for conserving aquatic ecosystems.
- Long-term sustainability of fisheries and aquaculture sectors.

b) Policy Area 2: Small-Scale Fisheries Development

Recommended Actions:

- Incorporate small-scale fisheries into broader agricultural value chains by funding infrastructure development, capacity building, and market access.
- Develop donor-funded projects to capitalize the fisheries management and provide technical assistance and training for local fishers.

Expected Outcomes:

- Empowered small-scale fishers with improved livelihoods.
- Enhanced market competitiveness and economic opportunities for small-scale fisheries.
- Sustainable practices in small-scale fisheries, bolstering food security.
- Effective fisheries management programs

c) Policy Area 3: Sustainable Aquaculture Management

Recommended Actions:

- Implement investment plans targeting productivity, disease management, and climate resilience in aquaculture.
- Launch training programs to equip stakeholders with knowledge on biosecurity, sustainable practices, and climate-adaptive techniques.
- Mitigate challenges such as water scarcity and climate change impacts through targeted innovations.

Expected Outcomes:

- Strengthened aquaculture development and productivity.
- Resilient aquaculture systems with enhanced adaptive capacity.
- Improved stakeholder capacity to adopt modern and sustainable practices.

d) Policy Area 4: Responsible and Equitable Fish Trade and Marketing

Recommended Actions:

- Develop a comprehensive fish trade and marketing strategy to ensure access to regional and global markets, promote value chain development, and facilitate trade.
- Harmonize trade regulations and standards within SADC and AU frameworks.
- Formalize cross-border (transboundary) fish trade
- Introduce support mechanisms for small and medium-scale fish producers, processors, and traders.

Expected Outcomes:

- Improved access to markets for fish and fish products.
- Strengthened value chains in fisheries and aquaculture.
- Increased regional cooperation and market integration in fish trade.

e) Policy Area 5: Regional and Sub-Regional Cooperation

Recommended Actions:

- Promote transboundary cooperation with neighboring countries.
- Utilize regional resources for capacity building, research, and development.

Expected Outcomes:

- Enhanced regional collaboration in fisheries and aquaculture management.
- Improved alignment with regional frameworks and resource prioritization.
- Better management of shared ecosystems for sustainability.

f) Policy Area 6: Awareness Enhancement and Human Capacity Development

Recommended Actions:

- Create awareness, develop and implement training programs.
- Establish platforms for knowledge-sharing and the dissemination of best practices.

- Provide educational programs and professional development for the proposed fisheries unit or department and for fisheries managers and other resources.

Expected Outcomes:

- Improved technical capacity among stakeholders, leading to better sector management.
- Greater community involvement in sustainable practices.
- Increased stakeholder engagement.

g) Policy Area 7: Cross-Cutting Issues in Fisheries and Aquaculture

Recommended Actions:

- Integrate gender-sensitive approaches into fisheries and aquaculture policies to ensure equal participation for women and marginalized groups.
- Promote environmental sustainability by adopting ecosystem-based management practices.
- Introduce climate-resilient measures such as adaptive management strategies and climate-proof infrastructure.

Expected Outcomes:

- Greater inclusivity and gender equality in the sector.
- Enhanced resilience to climate change impacts.
- Long-term sustainability through environmentally sound practices.

h) Monitoring and Evaluation (M&E) Framework for CATSP

Institutionalize M&E Systems:

- Establish effective M&E framework in the Department of Fisheries to oversee fisheries and aquaculture investments under the CATSP.
- Define clear roles for coordination, reporting, and data management in the Ministry of Fisheries and Livestock.

Align Indicators with CAADP Results Framework:

- Incorporate performance indicators aligned with CAADP results framework

Strengthen Data Collection Systems:

- Develop real-time data collection systems to monitor fish stocks, water quality, and aquaculture production.
- Leverage digital platforms for efficient reporting and stakeholder access.

Promote Stakeholder Engagement:

- Engage communities, private sector actors, and NGOs in M&E activities.
- Facilitate consultations and feedback mechanisms to ensure inclusivity.

Leverage Technology in M&E:

- Train planners and field officers to use GIS, remote sensing, and mobile apps for monitoring activities.
- Establish a centralized platform for tracking and sharing results.

Integrate Climate Resilience and Gender Inclusivity:

- Track progress on climate adaptation and gender equity through M&E systems.
- Collect gender-disaggregated data to assess participation in the sector.

Periodic Reviews and Adjustments:

- Conduct regular reviews of fisheries and aquaculture projects, using M&E data for updates and develop an investment plan aligned with Malabo goals
- Share findings with stakeholders to guide evidence-based adjustments.

Strengthen Regional Collaboration:

- Coordinate with regional bodies such as AU-IBAR and SADC for alignment with CAADP initiatives.
- Participate in regional dialogues to share lessons and adjust policies as necessary.

Ensure Policy Coherence:

- Harmonize M&E frameworks with other related national strategies on climate change, biodiversity, and sustainable development.
- Form inter-sectoral committees to align NAIP with other policies to ensure synergy across national policies and enhance the sector's contribution to sustainable development.

8. STRENGTHS, WEAKNESSES, OPPORTUNITIES, THREATS (SWOT) ANALYSIS FOR THE FISHERIES AND AQUACULTURE SECTOR

The fisheries and aquaculture subsector in Zambia has many strengths and opportunities that can positively influence growth, much as there are threats and weaknesses to negatively impact the industry. The country's abundant water resources, favourable climate, and existing legal and institutional frameworks offer a solid foundation for growth. However, limited sector-specific policies, outdated data, and environmental degradation pose substantial barriers.

This SWOT analysis was conducted to assess the fisheries and aquaculture policies, plans and strategies' capacity to influence the subsector. To this end, the following documents were analysed:

- The NAIP I and NAIP II (CATSP)
- National Fisheries and Aquacultural Policy (NFAP)
- National Policy on Environment (NPE)
- National Adaptation Plan (NAP)

By conducting this analysis, it is hoped that existing capacities for growth of the sector will be identified, while at the same time detecting challenges that need to be addressed in order to ensure development. By addressing the weaknesses and capitalizing on emerging opportunities such as access to new regional and sub-regional, rural and urban economies can experience unprecedented benefits. Moreover, addressing threats from climate variability, environmental degradation, and competing water uses will be essential to ensuring the long-term resilience and success of the sector. In view of the above, following are the SWOT analyses of the afore-mentioned plans and strategies.

8.1 CATSP/NAIP on Climate Change

Table 5: *SWOT analysis of Fisheries and Aquaculture sector in relation to Climate Change*

Strengths	**Weaknesses**
• Prioritization of sustainable natural resource management in NAIP and CATSP. • Recognition of Climate Change as major a challenge. • Recognition of rich fish species diversity • Tropical climate ideal for fish production. • Existing legal and regulatory framework for fisheries and aquaculture	• Weak research capacity in climate change • Limited clear fisheries climate change strategies • Limited stakeholder engagement • Low staffing levels resulting in weak law enforcement capacity • Insufficient funding and technical capacity in the sector.
Opportunities	**Threats**
• Development of fisheries climate change strategic plan • Diversification of aquacultural species • Establishment of multistakeholder platform • Membership to regional and global bodies • Increased investment in infrastructure and climate smart aquacultural technologies • Establishment of early warning system for capture fisheries and aquaculture	• Vulnerability to climate change impacts on water resources. • Competition from established global fish exporters/importers. • Reduced production and productivity • Slow policy reform and regulatory updates may hinder growth.

Table 6 SWOT Analysis of the National Adaptation plan in relation to fisheries and aquaculture

Strengths	Weaknesses
• Recognition of fisheries and aquaculture vulnerability to climate change • Recognition of aquatic biodiversity • Recognition of rich fish species diversity • Existing legal framework for fisheries and aquaculture • Prioritisation of climate-smart aquacultural technologies	• Lack of clear policy on operational cooperation • Limited interactions among lead ministries in developing fisheries climate change strategies • Lack of ecosystem-based management solutions • Insufficient funding and technical capacity in the sector. • Challenges in implementing climate-resilient practices at scale.
Opportunities	**Threats**
• Development of fisheries climate change strategic plan • Establishment of multidiscipline catchment technical teams • Membership to transboundary, regional and global bodies • Increased investment in infrastructure and climate smart aquacultural technologies • Establishment of early warning system for capture fisheries and aquaculture	• Vulnerability to climate change impacts on water resources. • Environmental degradation. • Loss of biodiversity • Reduced production and productivity • Slow policy reform and regulatory updates may hinder growth.

9. CASE STUDIES

9.1 Lessons from Kenya

The National Climate Change Action Plan 2013-2017 for Kenya was created with the aim of implementing the National Climate Change Response Strategy (NCCRS) (2010). It was part of the efforts being made towards accomplishing the components of the Vision 2030. The NCCRS' primary focus was ensuring adaptation and mitigation measures are integrated in all government planning, budgeting and development objectives. It called for collaborative and joint action with all stakeholders (private sector, civil society, NGOs, faith-based organizations, etc) in tackling the impacts of climate change. The most vulnerable sectors of the economy namely agriculture, water, energy, forestry, rangelands, health, social and physical infrastructure were prioritized for quick and immediate action. The on-going responses to Climate Change incorporated in the Action Plan target various sectors, these included;

- Agriculture (e.g. weather indexed crop insurance scheme);
- Livestock & Pastoralism (e.g. documenting indigenous knowledge);
- Water Resources (e.g. de-silting rivers and dams);
- Forests (e.g. agroforestry-based alternative) and;
- Energy (e.g. alternative energy; geothermal).

In addition to these responses, the Action Plan included a section that explored actions aimed at ensuring a successful transition to a low carbon climate resilient pathway. Some of the components included were:

- Agroforestry
- Forest Conservation
- Water Resource Management,
- Renewable Energy Systems (reduce reliance on hydropower)
- Off-grid electricity generation (e.g. wind turbines)
- Improved Community-level healthcare and dissemination of information on changing health risks.

The section of the Action Plan pertaining to funding explained that the strategies that would be financed by bilateral, multilateral funding and international climate finance mechanisms (e.g. Green Climate Fund, Adaptation Fund, emerging Nationally Appropriate Mitigation Actions (NAMAs) and REDD+ mechanisms).

There was also a component of the Action Plan that deals specifically with addressing vulnerability, with detailed guideline examples for drought management and the agriculture sector. (Government of Kenya, 2013).

9.2 Lessons from South Africa

The strategic priorities of South Africa's National Climate Change Response were listed below;

- Risk reduction and management;
- Mitigation actions with significant outcomes;
- Sectoral responses (key actors in strategy formulation and implementation);
- Policy and regulatory alignment
- Integrated planning (mainstreaming of climate change response);
- Informed decision-making and planning;
- Technology research, development and innovation;
- Facilitated behaviour change (towards lower-carbon society and economy)
- Behaviour changes through choice;
- Resource mobilization.

The National Climate Change Response includes a sub-section that focuses on challenges and strategies specific to the 39% of South Africans, who live in rural areas. The responses to the listed challenges include;

- Education of small-scale/subsistence farmers;
- Develop adaptation strategies;
- Empower women in policy design and implementation;
- Design and implement economic and livelihood diversification programs in rural areas;
- Prioritise technology for climate change adaptation within rural areas (e.g. lower water use irrigation systems);
- Ensure disaster management architecture that includes provision of safety nets for rural communities.

9.3 Lessons from Zambia's Aquacultural Growth

Aquaculture, the world's fastest-growing food production sector, has immense potential to boost socio-economic development through job creation, food security and income generation. This industry also addresses declining fisheries resources by providing an alternative source of fish. Zambia, with its abundant freshwater resources and strategic focus, is successfully tapping into this opportunity, addressing challenges and positioning itself as a rising star in aquaculture production.

Zambia's aquaculture consists of two main systems, namely, pond and cage fish farming. It is established in all the three (3) agroecological zones: the warm low rainfall (maximum rainfall: 0-700mm per annum) zone 1, medium rainfall (maximum rainfall 700-1000mm per annum) and the high rainfall (More than 1000mm

annual rainfall). Five species are now mainly used in aquaculture; five cichlid species (Orechromis niloticus, O. andersonii, O. macrochir, O. tanganicae and Coptodon rendalli) and one catfish (Clarius gariepinus). Currently, 90% of the fish production is based on the non-native O. niloticus but efforts are being made to improve indigenous species (O. andersoni and O. macrochir) in order to circumvent the challenges linked to the use of exotic species.

The aquaculture sub-sector has seen impressive growth in production from about 4,240 metric tonnes in 2000 to more than 75,000 metric tonnes in 2024. 90% of the fish produced locally is consumed within Zambia with rest being exported to neighbouring states. The growth of aquaculture is attributed to a shift in government policy to pay extra attention to the subsector by capitalizing it through the Zambia Aquaculture Enterprise Development Project (ZAEDP), which was implemented from 2015 to 2024.

9.3.1 Opportunities for Expansion

Zambia is endowed with abundant water resources which can support greater aquacultural growth. With more than 15 million hectares coverage of water in form of lakes and rivers, and another 8 million hectares covered by wetlands, Zambia boasts of having more than 40% of water resources in Southern Africa. Warm climatic conditions (nine months of warmth) coupled with rich diversity of culturable fish species puts Zambia at a comparable advantage to growing a robust aquacultural industry. Moreover, a deliberate government policy of promoting aquaculture has resulted in many Zambians joining the sector along the value chain and creating opportunities for expansion. Following is a summary of the opportunities for expansion within the aquaculture subsector in Zambia:

a. Taking advantage of conducive environment: Zambia is endowed with abundant water resources, which have been the anchor of the growing aquaculture industry. Over the last ten years, Zambia has increased the annual fish production from 25,000 MT in 2014 to 89,000 MT in 2024. This growth is attributed to the interventions by government, which include the development and implementation of the National Aquaculture Strategy in 2006. The strategy identified the main impediments of growth and made some key proposals, which included capitalisation of the sector.
b. Increased Local and Global Demand for Aquaculture Products: Fish make up 40% of animal protein intake thus making Zambia a good market for fish. This coupled with the regional markets in the Democratic Republic of Congo and Angola means that fish produced in Zambia can be consumed locally as well as within the region.
c. Expansion of Aquaculture around the country: At the time of introducing aquaculture was mainly practiced in the Copperbelt, Eastern Province, North-Western and Muchinga Provinces. This was so because the above provinces do not have major fishery areas. However, with the introduction of Cage aquaculture and the national promotion drive, aquaculture has taken on a national character, with aquaculture facilities being established around the country. Further, while aquaculture was initially limited to small-scale levels, commercial aquaculture has come into play, with more than 50% of production coming from commercial cage fish farms on Lake Kariba. There is potential for further growth through cage fish farming in Zambia.
d. Identification of High Aquaculture Potential Zones (HAPZs): During the implementation of the first National Aquaculture Strategy, four areas were identified as Aquaculture High Potential Zones. These places were in Southern Province (Siavonga), North-Western Province (Kasempa), Lusaka province

(Rufunsa later changed to Kafue), Northern Province (Mungwi) and Luapula Province (Samfya). These areas were designated as high potential zones for aquaculture because of having available water resources; access to market; suitable soils and suitable climatic conditions. Currently, five (5) aquaculture service centers have been developed in the HAPZs in a bid to establish Aquaculture Parks.

e. Capitalization of Aquaculture: Between 2015 and 2024, Zambia implemented the Zambia Aquaculture Enterprise Development Project. The project aimed to promote and support entrepreneurship along the aquaculture value chain, which included fish production, processing (value addition), transportation and trade. The project also supported the establishment of input (fish seed and feed) production and supply system, and access to finance, through the establishment of the aquaculture seed fund.

f. Job Creation and Community Development: Increased aquacultural activities in Zambia have seen a corresponding increase in jobs created within the sector along the value chain. According to the 2023 aquaculture survey, more than 19,000 households were engaged in aquaculture by the end of 2022. This number is spread across the country with Southern Province having the lowest number and Northern Province recording the largest number of households involved in aquaculture.

g. Environmental Sustainability with Regulatory Support: The existing regulatory framework advocates for the best aquaculture practices. Zambia laws demand that an Environmental Impact Assessment be conducted for projects exceeding Zambia launched the first national fisheries and aquaculture policy in 2023. The policy promotes sustainable aquaculture and specifically, ecosystem approach in aquaculture (EAA). The improvement of native fish species for aquacultural purposes was also driven by the aspirations to preserve as much as possible the aquatic ecosystems thus far not impacted by introductions of O. niloticus.

10. CATSP/NAIP ALIGNMENT WITH THE CAADP PROCESSES

During the Malabo declarations of 2014, African Heads of States made the following commitments: a) Recommitment to the Principles and Values of the CAADP Process; b) Enhancing Investment Finance in Agriculture; c) Halving Poverty by the year 2025, through Inclusive Agricultural Growth; d) Boosting Intra-African Trade in Agricultural commodities and services e) Enhancing Resilience of Livelihoods and Production Systems to Climate Variability and other related risks; f) Mutual Accountability to Actions and Results; and g) Strengthening the African Union Commission to support delivery on these commitments.

To monitor progress made by AU-MS in line with the above commitments, biennial reviews are conducted by NEPAD. The biennial reviews were requested by the heads of states and they provide an overview of the extent to which Member States have adhered to the Malabo Summit aspirations espoused in the seven (7) Commitments to reconfirm the importance of investing in agriculture to realize inclusive and sustainable economic growth and poverty reduction.

In the last biennial review conducted for the period 2015 to 2023, Zambia scored an overall of 54% in terms of adherence to the commitments, with a mixture of different levels of successes. For instance, in terms of data reporting, which is in line with commitment no. 7 (g), Zambia scored 45.4. Thus, the overall performance

of Zambia in the 4th biennial review shows a decline from the previous ones, albeit with mixed results when looked at on a commitment basis. It is therefore important for Zambia to begin to make progress in terms of being on track with the CAADP processes. As at the end of August 2025, Zambia had finalised the development of the CATSP, which is also referred to as the NAIP II.

The poor performance in the biennial review could be attributed to the absence of a comprehensive monitoring mechanism that could enhance timely capturing of data on the operations of the four main sub-programmes, namely, Crops, Livestock, Fisheries and Forestry. It is therefore recommended that during the implementation of CATSP, a multisectoral monitoring mechanism is established that will ensure efficient information-sharing and reporting. This could be attained through an online reporting platform.

11. CONCLUSION

Zambia's fisheries and aquaculture sector has the potential to make greater contribution to economic growth, and food and nutritional security. However, climate change poses serious threats to aquatic ecosystems, including rising water temperatures, altered river flows, and habitat degradation, which could adversely affect fish populations, productivity, and rural livelihoods. The ability to adapt is further constrained by outdated policies, inadequate infrastructure, and limited technical capacity.

In order to overcome the above-mentioned challenges, there will be a need to allocate more resources to the agriculture sector, prioritizing the integration of fisheries and aquaculture into national climate policies, strengthening institutional frameworks, and improving monitoring and data management systems, which are critical for building adaptive capacity. Strategic investments and regional collaboration will also be essential to unlock technical support and financing to ensure the sustainability of the sector. Having aligned the NAIP to CAADP, Zambia will have to further improve on the implementation of the programme/plan so as to accrue maximum benefits from it.

REFERENCE

1. ***AUC-NEPAD (2003).*** Maputo CAADP Agreement
2. ***AUC-NEPAD (2014).*** Malabo CAADP Declaration
3. ***AUC-NEPAD (2014).*** The Policy Framework and Reform Strategy for Fisheries and Aquaculture in Africa
4. ***AUC-NEPAD (2015).*** A guide for the implementation of the Policy Framework and Reform Strategy for Fisheries and Aquaculture in Africa
5. ***AUC-NEPAD (2025).*** Kampala CAADP Declaration
6. ***Department of Environmental Affairs (2011).*** National Climate Change Response White Paper. Pretoria, RSA. https://www.gov.za/sites/default/files/gcis_document/201409/-nationalclimatechangerespo nsewhitepaper0.pdf
7. ***FAO (1995).*** Code of Conduct for Responsible Fisheries; the Food and Agriculture Organization of the United Nations Rome, 1995.
8. ***Barange, M., Bahri, T., Beveridge, M.C.M., Cochrane, K.L., Funge-Smith, S. & Poulain, F., eds. (2018).*** Impacts of climate change on fisheries and aquaculture: synthesis of current knowledge, adaptation and mitigation options. FAO Fisheries and Aquaculture Technical Paper No. 627. Rome, FAO. 628 pp.
9. ***Hamududu, B. H., and Ngoma. (2018).*** H. Impacts of Climate Change on Water Availability in Zambia: Implications for Irrigation Development. In Tech. Rep. IAPRI. Lusaka, Zambia.
10. ***MAL. (2011).*** Fisheries Act. No. 22. Ministry of Agriculture and Livestock. Lusaka, Zambia.
11. ***MCTI. (2018).*** National Trade Policy. Ministry of Commerce Trade and Industry, Lusaka, Zambia.
12. ***MFL. (2020).*** National Aquaculture Trade Development Strategy. Ministry of Fisheries and Livestock, Republic of Zambia, Lusaka
13. ***MFL. (2023).*** National Fisheries and Aquaculture Policy,); Ministry of Fisheries and Livestock, Republic of Zambia, Lusaka.
14. ***MGEE. (2016).*** National Policy on Climate Change. Ministry of Green Economy and Environment. Ministry of Green Economy and Environment, Lusaka.
15. ***MTENR. (2007).*** National Policy on Environment. Ministry of Tourism, Environment and Natural Resources, Lusaka
16. ***MTENR. (2011).*** Environmental Management Act. Ministry of Tourism, Environment and Natural Resources. Lusaka, Zambia.
17. ***MFL. (2025).*** Comprehensive Agriculture Transformation Support Program, Lusaka, Zambia
18. ***Mohammed, E. & Uraguch, Z. B. (2013).*** Impact of Climate Change on Fisheries: Implications of Food Security in Sub-Saharan Africa. In: Global Food Security. Munir H. Edit.
19. ***MAL. (2014).*** National Agriculture Investment Plan (2014-2018). Lusaka, Zambia.
20. ***Katongo, C., Phiri, H. & Kefi, A. S. (2024).*** The Fisheries and Aquaculture Sector in Zambia. In The Oxford Handbook of the Zambian Economy. Oxford University Press. 22p
21. ***Ministry of Environment and Mineral Resources, (2010).*** National Climate Change Response Strategy. Nairobi, Kenya. 122pp. https://www.cdkn.org/sites/default/files/files/National-Climate-Change-Response-Strategy_April-2010.pdf

APPENDIX

Table 7 Group scoring of the NAIP/CATSP alignment to the PFRS - Zambia

POLICY AREA 1: CONSERVATION AND SUSTAINABLE FISHERIES AND AQUACULTURE RESOURCE USE					
Criteria for Alignment		**Check X to Indicate if:**			
		YES	**NO**	**PARTIALLY**	
Outcome 1: Policies, frameworks and tools in place to sustainably increase national benefits from fisheries and aquaculture					
1.	Fisheries and aquaculture are mainstreamed into national development	YES			Covered in Vision 2030, 8NDP & NFAP
2.	Globally accepted best practices integrated into national policy frameworks and tools			PARTIALLY – 70%	Not all tools have been adopted
3.	Policy and management decisions are made based on the existence of reliable data and information management systems			PARTIALLY – 60%	Available data is not consistent and not easily accessible to stakeholders
4.	Adoption of participatory fisheries management mechanisms/approaches			PARTIALLY – 50%	Policy does recognise but implementation is low. Policy only recognises one mechanism but there are several methods that can be adopted
Outcome 2: Effective and sustainable national and regional Monitoring, Control and Surveillance systems in place to ensure that sustainable benefits are realized					
1	National fisheries agencies have all aspects of MCS in place and functioning			PARTIALLY – 70%	Not fully functional because of limited human & financial resources
2	Mechanisms in place for efficient and effective regional cooperation on fisheries MCS			PARTIALLY – 60%	Other water bodies do not have active cooperation with other states e.g Mweru
Outcome 3: Healthy ecosystems to support sustainable fisheries and aquaculture					
1	Scientific research (natural, social, economic and technological) that support fisheries management and aquaculture development in place			PARTIALLY – 90%	Inadequate human and financial capacity. Mainly doing routine activities
2	Tools and programmes in place to protect fishery resources and their habitats	YES			However, process of gazetting is long

POLICY AREA 2: SMALL SCALE FISHERIES DEVELOPMENT					
Criteria for Alignment		**Check X to Indicate if:**			
		YES	**NO**	**PARTIALLY**	
Outcome 1: Role and importance (contribution) of fisheries for improved livelihoods, food and income of small-scale fishing communities and related operators are evident, recognized and secured in Member States					
1	Mechanisms and strategies highlight the economic and social importance of small-scale fisheries development	YES			
2	Mechanism and strategies to unlock and unleash potentials of the subsector to generate socio-economic benefits are in place			PARTIAL – 90%	Livelihood activities are there but no coherent guidelines
3	Ensure a system to facilitate organized value chain development in order to effectively derive the benefits from the small-scale fisheries	YES			
4	Small Scale Fisheries prioritized in National Agricultural Investment Plans (NAIP), Poverty alleviation documents and National strategy documents, etc.	YES			
Outcome 2: Bilateral and regional cooperation for effective management of shared fishery resources and ecosystems is strengthened					
1	Adoption and implementation of Regional and intra-regional minimum terms and conditions for access			PARTIAL – 50%	Enforcement is weak and only one shared body currently has (Kariba)
2	Mechanisms in place for efficient and effective regional cooperation on fisheries management, including MCS, migratory and shared stocks			PARTIAL – 75%	Its done in limited places
Outcome 3: Fishers are organized to foster good fisheries governance, sustainable development and responsible use of natural resources					
1	International Guidelines for Securing Sustainable Small-scale Fisheries are appropriately applied			Partial-60%	Inconsistency in the application of the international guidelines due to lack of manpower
2	Capacity of fisheries stakeholders and institutions for participatory management of the fisheries are developed and nurtured			Partial – 70%	Slow adoption by the community
POLICY AREA 3: SUSTAINABLE AQUACULTURE MANAGEMENT					
Criteria for Alignment		**Check X to Indicate if:**			
		YES	**NO**	**PARTIALLY**	
Outcome 1: Improved market-led aquaculture investments					
1	Inclusion of Markets campaigns for aquaculture products (awareness creation, PPPPs – Price, Place, Promotion and Product)			PARTIALLY- 50%	Inadequate knowledge by the stakeholders.
2	Aquaculture infrastructure- provision of measures for states to provide basic infrastructure for aquaculture development	YES			

3	Financing/investment strategy - provision for the promotion of financial instruments such as guarantee funds, micro-credit institutions	YES			Available facilities are designed for small to medium scale.
4	Quality assurance and standards - provision for aquaculture product labelling and traceability through certification programmes			PARTIALLY- 40%	
5	Skills development plan - Provision in the policy for aquaculture development plan and strategies to appropriately address competencies and skills development				
6	Research and Extension Services - Provision adequate funding for research to enhance technology development and innovation				
7	Fish farmers associations or cooperatives- Existence of an institutional framework to allow Fish farmers associations and cooperatives to flourish				
8	Enabling environment – Provision of policy and institutional framework as well as one stop shop to facilitate registrations and investments by the private sector				
9	Growth in trade of locally produced aquaculture products- Provision for protection of local aquaculture products from imported products. Existence of programmes to increase competitiveness of locally produced aquaculture products				
POLICY AREA 4: RESPONSIBLE AND EQUITABLE FISH TRADE AND MARKETING					
Criteria for Alignment		**Check X to Indicate if:**			
		YES	**NO**	**PARTIALLY**	
Outcome 1: Improved intra and inter regional trade					
1	Compliance with agreed regional trade protocols and regulations				
2	Coherence of fish trade policies with other policies				
3	Compliance with sanitary standards and market requirements				
Outcome 2: Increased competitiveness for African fish and fishery products					
1	Economically efficient fisheries sector - Ensures fisheries are sustainably managed and supported by appropriate infrastructure and prudent macroeconomic management				
2	Standards and supportive technology - Infrastructure, such as National fisheries quality control laboratory for standardization of fishery products is in conformity to international guidelines for certification of fishery products				
3	Competitiveness through increasing value chain efficiencies - Inclusion of appropriate pricing conditions for value addition across value chain segments				
4	Coherence of trade policies (harmonization) - National trade policies should be coherent and harmonized at subregional or regional levels				

5	Consumer Information - Ensure that that there is symmetric information between buyers and sellers				
POLICY AREA 5: REGIONAL AND SUB-REGIONAL COOPERATION					
Criteria for Alignment		**Check X to Indicate if:**			
		YES	**NO**	**PARTIALLY**	
Outcome 1: International fisheries issues at regional levels are coherent and harmonized					
1	Entrench awareness of important international instruments for sustainable fisheries management and frameworks that identify the need for their domestication in realizing sustainable fisheries management				
2	PFRS policy options reflected in international policy instruments			X Not sure	
3	PFRS act as a reference in international policy influence including existing and upcoming policies			X Not sure	
4	Transparency, accountability and effective participation of stakeholders are hallmarks of RECs and RFBs in Africa			X Not sure	
Outcome 2: RECs and RFBs are positive forces for fisheries management within the framework of regional economic and political integration agenda					
1	Mechanisms for linkages between REC's and RFB's exist				
2	The role of REC's and RFB's as vehicles to promote fisheries and aquaculture is defined				
3	Strategies and Mechanisms for preventing and resolving regional conflicts are in place				
POLICY AREA 6: AWARENESS ENHANCING AND HUMAN CAPACITY DEVELOPMENT					
Criteria for Alignment		**Check X to Indicate if:**			
		YES	**NO**	**PARTIALLY**	
Outcome 1: Enhanced sectoral competencies and proficiencies					
1	Continuous professional education, mentorship and training - Provision for facilitating continuous awareness and enabling environment to seize and utilize opportunities for sectoral development	YES			
2	Accreditation of practitioners and institutions -	YES			
3	Facilitate centres of excellence of fisheries and aquaculture - Provision in the national and regional policies that ensures continual establishment, development and maintenance of minimum operating standard centres of excellence for fisheries and aquaculture				NOT SURE
Outcome 2: Improved evidence based decision making					
1	Information based policy decision making	YES			
2	Information sharing between policy makers and policy consumers	YES			
3	Responsive to real community needs - Provision of improved enabling conditions in fish producing communities to enhance competence	YES			

POLICY AREA 8: CROSS CUTTING ISSUES IN AFRICAN FISHERIES AND AQUACULTURE					
A. Strengthening resilience and reducing vulnerabilities to climate change in African fisheries and aquaculture					
Criteria for Alignment		**Check X to Indicate if:**			
		YES	**NO**	**PARTIALLY**	
Outcome 1: Adaptive capacity and resilience at the local level built					
1	Capacity building programme on climate smart fisheries - Policy provision to promote capacity building in the sector on climate change	YES			
2	Communication systems- Participatory Climate Change (CC) and Disaster Risk (DR) vulnerability assessment and aquaculture development	YES			
3	Facilitate the creation of alternative livelihoods - Opportunities should be available for at least temporary shifting to alternative occupation in the event of shocks	YES			
4	Early warning system in place as a focus for disaster - Mechanism should exist at national and regional levels	YES			
Outcome 2: Policy coherence and coordination at the national and regional levels improved					
1	Disaster risk management (DRM) and climate change Adaptation (CCA) policies include fisheries and aquaculture	YES			
2	Fisheries and aquaculture policies include DRM and CCA	YES			
B. Gender and Youth					
Outcome 1: Increased access to resources					
1	Policies and interventions aimed at attracting women and youth should address key barriers and constraints to entry and access to land and water	YES			
2	Security of investment and access rights and ownership - Policy provisions for the system to ensure security of investments and create market certainty	YES			



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