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# PERFORMANCE AUDIT REPORT

ON

## MANAGEMENT OF FISHING ACTIVITIES IN KENYA

BY

## THE KENYA FISHERIES SERVICE



December 2022

## **VISION**

Making a difference in the lives and livelihoods of the Kenyan People

## **MISSION**

Audit services that impact on effective and sustainable service delivery

## **CORE VALUES**

Independence

Credibility

Relevance

Accountability

Integrity

## **MOTTO**

Enhancing Accountability

## **FOREWORD BY THE AUDITOR- GENERAL**

I am pleased to present this Performance Audit Report on Management of Fishing Activities in Kenya by the Kenya Fisheries Service. My Office carried out the audit under the mandate conferred on me by Section 36 of the Public Audit Act, 2015. The Act mandates the Auditor-General to examine the economy, efficiency and effectiveness with which public money has been expended pursuant to Article 229 (6) of the Constitution of Kenya, 2010.

Performance, financial and compliance audits form the three-pillars of the audit assurance framework that I have established to give focus to the varied and wide scope of the audit work done by my Office. The framework is intended to provide a high level of assurance to stakeholders that public resources are not only correctly disbursed, recorded and accounted for, but their use results in positive impacts on the lives and livelihoods of the Kenyan citizens. The main goal of our performance audit is to ensure effective use of public resources and promote service delivery to the citizens.

Our performance audits examine compliance with policies, obligations, laws, regulations, standards and whether the resources are managed in a sustainable manner. They also examine the economy, efficiency and effectiveness with which public resources have been expended. I am hopeful that corrective action will be taken in line with our recommendations in the report.

The report is submitted to Parliament in accordance with Article 229 (7) of the Constitution of Kenya, 2010 and Section 39 (1) of the Public Audit Act, 2015. I have also submitted copies of the report to the Director General, Kenya Fisheries Service, Principal Secretary, State Department for the Blue Economy and Fisheries, Principal Secretary, the National Treasury, and the Chief of Staff & Head of Public Service.

  
CPA Nancy Gathungu, CBS

**AUDITOR-GENERAL**

**23 December, 2022**

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## LIST OF ABBREVIATIONS

<b>Abbreviation</b>	<b>Definition</b>
BMU	Beach Management Unit
COVID 19	Corona Virus Disease 2019
EEZ	Exclusive Economic Zone
FMD	Fisheries Management and Development
FMD Act, 2016	Fisheries Management and Development Act, 2016
IUU	Illegal, Unreported and Unregulated
KeFS	Kenya Fisheries Service
KMFRI	Kenya Marine & Fisheries Research Institute
KEMFSED	Kenya Marine Fisheries and Socio-Economic Development
KMA	Kenya Maritime Authority
MCS	Monitoring, Control and Surveillance
OAG	Office of the Auditor General
SAI	Supreme Audit Institution
SDF	State Department of Fisheries
SDGs	Sustainable Development Goals
STCW	Standards of Training Certification and Watch Keeping
VMS	Vessel Monitoring System

## DEFINITION OF TERMS

The following definitions apply for purposes of this report.

**All weather road:** A road that can be accessed by vehicles during all the weather seasons throughout the year; murrum or tarmac.

**Artisanal fisheries:** Small scale traditional fisheries that may be carried out for subsistence or commercial purposes in which the owner is directly involved in the day-to-day running of the enterprise and relatively small amounts of capital are used.

**Banda:** Permanent structures used for handling fresh fish immediately after its landing.

**Dark vessel:** A vessel that does not transmit any tracking signals.

**Fisher Men:** Persons of either gender engaged in fisheries activities.

**Fish landing site:** A point on the coastline or shore which the Director-General of the Kenya Fisheries Service has by Gazette notice designated as a landing point for fish.

**Fishing gear:** Any instrument, equipment, net, cork, buoy or other article including part thereof used for purposes of fish finding, congregating fish or fishing.

**Fish processing:** Any action taken (including icing, freezing and canning) to alter the shape, appearance or form of fish from that in which the fish is when first taken out from its natural habitat.

**Industrial fishing vessel:** A decked fishing vessel with an overall length of twenty meters or longer with an inboard engine.

**Jetty:** A facility protruding into the lake to facilitate landing of craft.

**Kenya fishery waters:** Includes all maritime zones declared in the Maritime Zones Act, 1989; internal waters, lakes, riverine systems and any other waters including intertidal, inland and riverine over which Kenya exercises or claims jurisdiction.

**Vessel Monitoring System:** A satellite-based reporting system capable of monitoring the position and activities of fishing vessels.

**Pontoon:** A floating facility protruding into the lake to facilitate landing of craft.

**Post-harvest loss:** A reduction in quantity, quality or monetary value of fish through the supply value chain.

**Potable water:** Water that is suitable or safe for drinking.

**Semi industrial fishing vessel:** Includes decked and undecked fishing vessels with an overall length of not less than ten meters and not more than fifty Gross Registered Tonnage unpowered and powered by an inboard engine of at least forty horse power.

## EXECUTIVE SUMMARY

### Introduction

1. The fishing industry in Kenya contributes to food security, employment and rural development. In the Country, fisheries are mainly composed of natural fisheries and aquaculture. Natural fisheries are found in inland fresh water lakes, rivers, dams, and marine and coastal waters in the Indian Ocean. Aquaculture is the farming of water dwelling organisms in controlled or semi controlled environments to enhance productivity.
2. According to the Kenya Economic Survey, 2021, national annual fish production is approximately 149,700 metric tonnes, valued at Kshs.26 billion and earns about Kshs.3 billion in foreign exchange. This is derived from; freshwater-70%, aquaculture-13% and marine waters-17%. However, the current production levels do not meet the increased demand for fish in the country.
3. Management of fishing activities is carried out by the Kenya Fisheries Service (KeFS). Its responsibility is to conserve, manage and develop Kenya fisheries and aquaculture resources by carrying out monitoring, control and surveillance, licensing, quality assurance and capture management.
4. The fisheries sector in Kenya has been subject to overfishing, illegal, unreported and unregulated fishing. Further, pollution and climate change has negatively impacted on the fishing sector.

### Motivation for the Audit

5. The following factors informed the performance audit on the management of fishing activities in Kenya by the Kenya Fisheries Service: -
  - a. Kenya is a signatory to the UN Charter on Sustainable Development Goals (SDGs) which makes her bound by the resolutions. SDG 2 requires members to end hunger, achieve food security and improve nutrition and promote sustainable agriculture. Management of fishing activities fits into Target 2.1 which seeks to end hunger and ensure access by all people,

especially the poor and vulnerable to safe, nutritious and sufficient food all year round. Further, management of fishing activities contribute to the achievement of SDG 14 on conserving and sustainable use of the oceans, seas and marine resources for sustainable development.

- b. The fisheries sub sector contributed to 0.6% of Kenya's Gross Domestic Product (GDP) as at 2021. According to a study done by the Kenya Marine and Fisheries Research Institute (KMFRI), marine fishing produces 24,709 metric tonnes worth Kshs.4.6 billion annually. However, deep sea fishing if fully exploited has the potential to produce 150,000 to 300,000 metric tonnes valued at between Kshs.21 billion and Kshs.42 billion, annually. Full exploitation of marine fishing would double the current contribution of the fisheries sector to Kenya's GDP to 1.2%, as well as improve on the lives and livelihoods of the Kenyan Citizens.
- c. Data from KMFRI indicate that Kenya loses Kshs.11 billion annually as a result of illegal, unreported and unregulated fishing. Illegal, Unreported and Unregulated (IUU) fishing has been on the rise despite measures put in place to reduce it. Increased IUU has contributed to the decline in fish stocks in the country. Further, there has been declining fish stocks in marine shallow waters and inland waters.

#### **Audit Objective**

6. The audit assessed how the Kenya Fisheries Service is managing, conserving and developing fisheries in order to ensure adequate supply of fish in the Country.

#### **Audit Scope**

7. The audit assessed how the Kenya Fisheries Service is managing, conserving and developing fisheries in order to ensure adequate supply of fish in the Country. The audit covered a period of five financial years, from 2017/2018 to 2021/2022. The audit examination was undertaken at KeFS headquarters in Nairobi, as well as its regional offices in Mombasa, Kwale, Kilifi, Kisumu, Busia, Naivasha and Turkana. The audit was carried out between the months of January and November, 2022.

## Summary of Findings

### A. The Country has not Exploited its Full Potential for Deep Sea Fishing

8. Deep sea fishing is the activity of catching fish that live in the deep parts of the sea. The Country has been exploiting about 25,000 metric tonnes of fish in marine waters. If fully exploited, deep sea fishing has the potential to increase fish production to 300,000 metric tonnes valued at Kshs.42 billion. The inability to undertake deep sea fishing has been attributed to lack of skills and appropriate vessels and equipment, detailed out as follows: -

#### i. Inadequate Skills to Undertake Deep Sea Fishing

9. According to KeFS Strategic Plan, 2018 to 2022, training and skills development are key strategic focus areas whose objective is to build capacity in fisheries and aquaculture. KeFS had targeted to train 1,000 fishermen annually. A progress report on fish crew training dated 03 November, 2022 revealed that only 447 out of 13,426 fishermen from the Coast region had been trained on deep sea fishing. The remaining 12,979 were not trained and therefore, could not undertake deep sea fishing due to lack of skills. The Government invested over Kshs.150 million in the training of artisanal fishermen on deep sea fishing. However, none of the trained fishermen was engaging in deep sea fishing as at the time of the audit.

#### ii. Lack of Appropriate Vessels and Equipment to Undertake Deep Sea Fishing

10. In order to undertake deep sea fishing, fishermen require appropriate vessels and equipment, including; purse seiners, long liners and prawn trailers. The audit established that fishermen lacked the appropriate vessels and equipment to undertake deep-sea fishing. Instead, they were using dug-out canoes and small boats to carry out fishing in shallow waters. Further, fishermen lacked essential equipment for deep sea fishing, such as marine compasses, Global Positioning System (GPS), navigation lights, life jackets, radio transmission systems, and first aid kits.

11. The inability for fishermen to acquire vessels for deep-sea fishing was attributed to the high cost of deep-sea vessels. For instance, the total cost of a fully equipped semi-industrial vessel is approximated at Kshs.1.3 million, which is unaffordable for local fishermen to raise. Further, the approximate cost of an industrial vessel is Kshs.200 million and above, depending on the size and equipment installed.

#### **B. Fishermen were Experiencing Post-Harvest Losses**

12. Post-harvest loss is a reduction in quantity, quality or monetary value of fish in the supply or value chain. As a result, fish is either discarded or sold at a relatively low price. The audit established that fishermen experienced post-harvest losses across all the sampled 7 regional offices. Review of a technical report by the Kenya Marine and Fisheries Research Institute (KMFRI)<sup>1</sup> revealed that 97% of fish traders or processors and 75% of fishermen from the Lake Victoria region experienced post-harvest losses. Further, the *Rastrineobola Argentea* (Omena) species loss was estimated to be between 20% and 40% of the catch, which is valued at approximately Kshs.3.7 billion annually. The post-harvest losses were attributed to the factors detailed below: -

##### **i. Beach Management Units did not Observe Hygienic and Sanitary Requirements while Handling Fish**

13. Fish should be handled in accordance with the set hygienic and sanitary requirements. Physical inspection at the 18 sampled landing sites and Beach Management Units (BMUs) revealed that fishermen and fish traders did not handle fish in a hygienic manner. Fishermen were drying fish on bare ground as opposed to using drying racks. This increased the likelihood of the fish being contaminated, leading to degradation in the quality, thus contributing to post-harvest losses.

##### **ii. Fishing Vessels did not have Cooler Boxes and Ice Flakes**

14. Cooler boxes and ice flakes are essential as they are used to preserve and maintain fish quality in order to curb post-harvest losses. Physical inspection at the 18 sampled landing sites revealed that none of the fishermen had cooler boxes. Further, fishermen did not have access to ice flakes as none of the sampled

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<sup>1</sup> *Technical Report on the Post-Harvest Losses Assessment of One Major Commercial Fish (Rastrineobola Argentea, Omena) in Lake Victoria, May 2021.*

landing sites had ice plants. The audit revealed that 8 out of 18 landing sites had access to ice flakes from private vendors. However, factors such as long distances to reach the private vendors and the high cost of ice flakes deterred fishermen from using the ice flakes for fish preservation.

### **iii. Inadequate Sensitization on Fish Handling Practices**

15. The Kenya Fisheries Service is required to create public awareness in order to support fisheries conservation, management, development and sustainable use. The audit established that there was inadequate sensitization on fish handling practices in all the seven sampled regions. Review of the Authority to Incur Expenditure (AIE) for the financial years 2017/2018 to 2021/2022 indicated that KeFS regional offices did not receive budget allocations for awareness creation. Therefore, sensitization was carried out through a collaborative effort between KeFS and its stakeholders. However, the scope of the sensitization carried out by KeFS was limited to the objectives of the projects being implemented by stakeholders.

### **iv. Inadequate Infrastructure at the Sampled Landing Sites**

16. A landing site should have the following infrastructure; bandas, cold rooms, drying racks, smoking kilns, public fish store, jetty, pontoon, electricity, public toilet, potable water, all weather roads, net repair facilities, fish gear shop, craft repair facilities, engine repair facility, fenced handling area, fenced landing site and a BMU office. Physical verification of the sampled 18 landing sites revealed that none had all the required infrastructure; 6 had no bandas, 17 had no drying racks, smoking kilns and public stores, 14 had no jetty, 3 had no electricity, and 16 were on public land.

### **v. Inadequate Inspection of Fishing Activities**

17. Inspections for official control of fish, fishery products and fish feed should be carried out regularly. However, the Kenya Fisheries Service did not conduct regular inspections of fish handling at landing sites, markets, fish processing establishment and fishing vessels. This was attributed to a shortage of gazetted inspectors to undertake inspections. For instance, the Kilifi Satellite Office had 67 landing sites but no gazetted inspector. Further, the Kisumu Regional Office had 2 gazetted inspectors covering 304 landing sites. This led to lack of regular

inspections in landing sites, fish markets and vessels resulting in non-adherence to quality assurance requirements.

### **C. Declining Fish Stock in Inland and Shallow Marine Waters**

18. In order to protect, manage, use and develop aquatic resources in a sustainable manner, there is need to prevent or eliminate over-fishing and excess capacity. The audit established that fish stocks have been declining in inland and marine shallow waters. This was attributed to the following factors: -

#### **i. Fishermen were not Engaging in Alternative Sources of Livelihood**

19. The decline in fish stock was attributed to an increase in the number of fishermen due to lack of alternative sources of livelihood. Out of the 18 BMUs sampled, only 6 had members who had alternative sources of livelihood. The remaining 12 relied mainly on fishing as the sole source of livelihood.

#### **ii. The Kenya Fisheries Service had not Imposed Closed Seasons to Enhance Fish Breeding**

20. A closed season is a specified period during which a category of fish may not be fished or harvested. Closed seasons hold great significance as they allow for breeding of fish, leading to an increase in stock in the waters. The audit established that closed seasons used to be imposed between 2003 and 2012 for *Rastrineobola argentea* (Omena) in Lake Victoria. However, closed seasons have not been imposed for the last ten years. Therefore, fishing activities continued throughout the year, with no break for breeding, hence declining fish stocks.

### **D. Continued Illegal, Unreported and Unregulated Fishing**

21. Illegal, Unreported and Unregulated (IUU) fishing is a major contributor to overfishing, threatening food security, maritime livelihoods and fisheries sustainability. The audit established that there is continued IUU fishing which is attributable to the following factors: -

**i. Inadequate Monitoring Control and Surveillance by the Kenya Fisheries Service**

22. The functions of the Monitoring, Control and Surveillance Unit (MCS) entail monitoring, control, surveillance, enforcement and compliance. KeFS has not been conducting regular monitoring and surveillance of fishing activities due to lack of capacity by way of patrol boats, staffing and fuel. Therefore, KeFS relies on its stakeholders to carry out patrols. The reliance on stakeholders to conduct MCS has resulted in inadequate patrols.

23. A Vessel Monitoring System (VMS) is a satellite-based reporting system capable of monitoring the position and activities of fishing vessels. The Kenya Fisheries Service had installed VMS at its Coast Regional Office. However, only VMS, which is one of the four modules had been operationalized, leaving out the rest of the modules. Consequently, KeFS was unable to: monitor the real time movement of vessels; take aerial pictures to identify dark vessels and track areas with high fish quantity that need close monitoring.

**ii. Lack of Regulations to Establish and Stipulate the Functions of the Inter - Agency Unit on Monitoring, Control and Surveillance**

24. The Inter - Agency Unit provides a platform for various stakeholders to collaborate and effectively combat Illegal, Unreported and Unregulated (IUU) fishing. However, the unit had not been constituted. Further, there were no regulations establishing and assigning functions to the unit. Failure to establish the Inter-Agency Unit has led to lack of a platform for the stakeholders to work together towards combating IUU fishing. As a result, this has contributed to continued Illegal, Unreported and Unregulated fishing.

**iii. Inadequate Inspection by the Monitoring, Control and Surveillance Unit**

25. A valid and applicable license is required for using an industrial and semi-industrial fishing vessel, for fishing or fishing related activities in the Kenya fishery waters. Using an artisanal fishing vessel for commercial purposes also requires licensing. The Kenya Fisheries Service has not been conducting regular inspections on the licensing of fishing vessels, fishermen and use of illegal gear. The audit

established that there were unlicensed fishermen, vessels, use of illegal gear and fishing methods. In this regard, regular inspections by KeFS would aid in minimizing the illegalities and curbing illegal, unreported and unregulated fishing.

26. Data collection on species, weight and size of fish catch is important as it informs policy formulation. The audit established that data on fish catch was not being collected on a regular basis across all the regional offices. The irregular collection was attributed to lack of resources, office equipment, data collection tools, motorbikes, vehicles, fuel and adequate staff to undertake and monitor the data collection process. Consequently, KeFS did not have the current status of data to aid in decision making and inform policy formulation.

#### **E. Other Findings- Quality Control Laboratories were Not Operational**

27. As at the time of the audit, KeFS had three laboratories located in Nairobi, Mombasa and Kisumu. The contract to supply and install equipment for the three laboratories was signed on 23 October, 2013 with an implementation period of 18 months, at a cost of Kshs.656,780,692. As at the time of the audit, the laboratories had not been operationalized, nine years later, despite the significant capital investment. Further, the audit established that the then State Department of Fisheries, Aquaculture and the Blue Economy was yet to handover the three laboratories to KeFS. Consequently, value for money is yet to be realized on the investments in the three laboratories.

#### **Conclusion**

28. The Country's fishing sector has the potential to double its contribution to the GDP from the current contribution of 0.6% in 2021 to 1.2%. However, the fishing sector is faced with challenges that have led to an inadequate supply of fish in the Country.
29. Kenya's deep-sea fishing is underexploited despite it being one of the strategies for increasing fish production in the Country. The under exploitation is a result of majority of fishermen lacking the requisite skills and equipment to undertake deep sea fishing. Despite the Government investment in training fishermen in the Coast

region on deep sea fishing, the skills remain inadequate due to the low numbers trained and failure to undertake deep sea fishing post training. Further, the Country does not have an adequate number of deep-sea fishing vessels, owing to the high initial capital outlay required to acquire the vessels. Consequently, most of the vessels operating in Kenya are not locally owned.

30. The fishing industry in Kenya is experiencing huge post-harvest losses leading to wastage of food, thereby affecting food security in the Country. Post-harvest losses were as a result of landing sites lacking the requisite infrastructure and equipment for proper fish handling. KeFS inspections of landing sites has also been inadequate. In addition, there has been minimal awareness on proper fish handling methods, thereby contributing to post-harvest losses.
31. Fish stocks in both inland waters and marine shallow waters have been declining over the years. This has been due to overexploitation of the fishery resource as the fishing effort has increased. The increase in the fishing effort is attributed to fishermen not engaging in alternative sources of livelihood. The Kenya Fisheries Service has also not instilled measures to mitigate the declining fish stock. For instance, since 2012, there have been no closed seasons to allow for natural breeding of fish.
32. There is inadequate monitoring and control by the Kenya Fisheries Service which has resulted in an increase of Illegal, Unreported and Unregulated (IUU) fishing activities. The increase in IUU is attributed to use of illegal gears and unreported catch at the landing sites. Such activities pose a threat to biodiversity, livelihood and food security which may lead to the collapse of fishery resources or impair efforts to rebuild stocks that have already been depleted. Further, the Government's investment in a Vessel Monitoring System to detect and deter IUU has not borne fruit as the system is yet to be fully operationalized.

## Recommendations

33. In view of the findings and conclusions of this audit, the Auditor- General makes the following recommendations for implementation by the Kenya Fisheries Service and relevant key stakeholders in the fishing sector. The recommendations are aimed at improving the management of fishing activities and ultimately increasing the contribution of the fishing sector to the Country's GDP.
34. To ensure that the Country has the capacity to undertake deep sea fishing:
- i. The State Department for the Blue Economy and Fisheries should develop a framework to enhance the Country's exploitation of deep-sea fishing. The framework should target assisting investors and those interested to venture in deep sea fishing to acquire semi – industrial and industrial vessels. This could be by way of lobbying The National Treasury to provide tax incentives to investors to promote investment in deep sea fishing;
  - ii. The Kenya Fisheries Service should ensure that the Kenya Fishing School has adequate capacity to train fishermen on deep sea fishing. This will ensure that more fishermen are trained on deep sea fishing; and
  - iii. The Kenya Fisheries Service should develop a framework to ensure the absorption of fishermen who have completed deep sea fishing training aboard commercial vessels.
35. To reduce post-harvest losses:
- i. The Kenya Fisheries Service should facilitate staff to carry out awareness creation activities on best practices in fish handling. The Kenya Fisheries Service should also undertake regular inspections of fishing vessels to ensure compliance with hygiene and sanitary requirements in all landing sites and fishing vessels. This would lead to improved fish quality and reduce post-harvest losses;
  - ii. The Kenya Fisheries Service should ensure that landing sites have the requisite infrastructure and equipment;

- iii. The Kenya Fisheries Service should enforce the compliance with regulations and standards in line with the Fisheries Management and Development Act, 2016; and
- iv. The Kenya Fisheries, in collaboration with stakeholders, should promote value addition in the sea food value chain in order to minimize post-harvest losses.

36. To mitigate declining fish stocks:

- i. The Kenya Fisheries Service in collaboration with the Kenya Marine and Fisheries Research Institute should establish the maximum sustainable yield in inland and marine shallow waters in order to regulate the fishing efforts. Further, the Kenya Fisheries Service should enhance monitoring, control and surveillance on the type of gear, mesh size, the types and or number of fishing vessels, the amount, size and age of fish that may be caught, landed or traded and regulate the landing of fish in fish landing sites;
- ii. The Kenya Fisheries Service should implement closed seasons across all high commercial value species. This will allow fish stocks time to regenerate naturally. Further, the Kenya Fisheries Service should ensure that no fishermen fish in prohibited fishing areas, such as breeding areas; and
- iii. The Kenya Fisheries Service, in collaboration with relevant stakeholders, should develop mechanisms of encouraging Beach Management Units to engage in alternative sources of livelihood.

37. To deter Illegal, Unreported and Unregulated fishing:

- i. The Kenya Fisheries Service should collaborate with the Kenya Coast Guard Service for continuous monitoring and surveillance of the territorial waters;
- ii. The Kenya Fisheries Service should make timely payment of subscription fees for the Vessel Monitoring System. Further, the Kenya Fisheries Service should consider operationalization of all the modules of the monitoring system. This will enhance monitoring and surveillance of fishing activities in the ocean, in order to mitigate and deter Illegal, Unreported and Unregulated fishing. In addition, adequate staff should be

trained and deployed to operate the Vessel Monitoring System. This will ensure that fishing activities in the Indian Ocean are monitored on a 24-hour basis;

- iii. The Kenya Fisheries Service should ensure that staff have the requisite equipment to enhance monitoring, control and surveillance; and
- iv. The Kenya Fisheries Service should fast track the finalization of regulations on the Inter-Agency Monitoring Control and Surveillance Unit, establishment of Beach Management Units, the prohibited fishing gear, marine protected areas and the export of live fish. This will enable the full operationalization of the Fisheries Management and Development Act, 2016.

38. To promote national and international fishing trade:

- i. The State Department for the Blue Economy and Fisheries should ensure that the process of installation of equipment in the laboratories is completed and that the laboratories are operationalized. Further, they should ensure that the laboratories are ISO Certified. This will demonstrate that the laboratories operate competently and generate credible results, thereby promoting confidence in their work, both nationally and internationally.

## 1.0 BACKGROUND OF THE AUDIT

### Introduction

- 1.1 The fishing industry in Kenya contributes to food security, employment and rural development. In Kenya, fisheries are mainly composed of natural fisheries and aquaculture. Natural fisheries are found in inland fresh water lakes, rivers and dams, and marine and coastal waters in the Indian Ocean. Aquaculture is the farming of water dwelling organisms in controlled or semi controlled environments to enhance productivity. Management of fishing activities ensures the continued productivity of the resources.
- 1.2 Fish and fisheries are an integral part of societies and make important contributions to economic, social health and well-being in many countries. The products from fisheries are used widely; from subsistence use to international trade as highly sought-after and highly-valued items. According to the Kenya Economic Survey, 2021, the national annual fish production is approximately 149,700 metric tonnes valued at Kshs.26 billion which earns foreign exchange amounting to Kshs. 3 billion. This production is distributed as follows; freshwater-70%, aquaculture-13% and marine waters-17%.
- 1.3 Management of fishing activities is carried out by the Kenya Fisheries Service (KeFS). Its responsibility is to conserve, manage and develop Kenyan fisheries and aquaculture resources by carrying out monitoring, control and surveillance, licensing, quality assurance and capture management.
- 1.4 The current per capita consumption of fish is at 4kgs, whereas the African continent and global average is 10kgs and 20kgs, respectively. There has been an ongoing campaign by KeFS towards encouraging Kenyans to consume more fish, in a bid to increase the per capita consumption. However, the current production does not meet the increased demand for fish in the Country. The fisheries sector in Kenya has been subject to overfishing, illegal, unreported and unregulated fishing. Further, pollution and climate change has negatively impacted on the fishing sector.

## Motivation of the Audit

1.5 In carrying out the audit, the Auditor- General considered the following factors.

i. Kenya is a signatory to the UN Charter on Sustainable Development Goals (SDGs) which makes her bound by the resolutions of SDG 2 which seek to end hunger, achieve food security and improve nutrition and promote sustainable agriculture. In particular, Target 2.1 which seeks to end hunger and ensure access by all people, especially the poor and vulnerable to safe, nutritious and sufficient food all year round. Further, management of fishing activities contribute to the achievement of SDG 14 on conserving and sustainable use of the oceans, seas and marine resources for sustainable development. It particularly addresses the following Targets:

- **Target 14.1** that seeks to prevent and significantly reduce marine pollution of all kinds, in particular from land- based activities including marine debris and nutrient pollution;
- **Target 14.4** that seeks to effectively regulate harvesting and end overfishing, illegal, unreported and unregulated, fishing and destructive fishing practices and implement science – based management plans in order to restore fish stocks in the shortest time feasible, at least to the levels that can produce maximum sustainable yields determined by their biological characteristics;
- **Target 14.6** that seeks to prohibit certain forms of fisheries subsidies which contribute to overcapacity and overfishing, eliminate subsidies that contribute to illegal, unreported and unregulated fishing; and
- **Target 14.b** that seeks to provide access for small – scale artisanal fishers to marine resource and markets.

This audit sought to assess the extent to which the Government of Kenya is on course towards the achievement of the two SDGs above.

ii. The Big Four Agenda had prioritized four pillars for economic development in the Country. Pillar two on food security and nutrition had a goal of ensuring 100% food security and nutrition. The fisheries sector was one of the opportunities identified for meeting the goal. The Government in its commitment towards the

realization of maximum benefit from the Blue Economy, has through KeFS, put in place a program geared towards training 1,000 fishermen on deep sea fishing in the coast region. The training aims at promoting economic growth from ocean resources in order to improve the livelihoods of the citizens. The audit assessed the extent to which KeFS has been able to train the fishermen for deep sea fishing as one of the interventions towards contributing to the Big Four Agenda.

- iii. The fisheries sub sector in 2021 was contributing 0.6% to Kenya's GDP<sup>2</sup>. According to a study done by the Kenya Marine and Fisheries Research Institute (KMFRI), marine fishing produces 24,709 metric tonnes worth Kshs.4.6 billion annually. However, if deep sea fishing was to be fully exploited, there is potential to produce up to 300,000 metric tonnes annually valued at Kshs. 42 billion. Full exploitation of marine fishing would double the fisheries sector contribution to Kenya's GDP to 1.2% and improve the livelihoods of Kenyan citizens. Despite the potential, Kenya still depends on fish imports from other countries such as China to meet its local demand. Therefore, the audit was necessary to assess the measures the Government has in place to exploit deep fish fishing.
- iv. Data from KMFRI indicate that the Country loses up to Kshs.11 billion annually as a result of Illegal, Unreported and Unregulated (IUU) fishing. IUU fishing has been on the rise despite measures put in place to control it. Increased IUU has contributed to the decline in fish stocks in the Country. Therefore, the audit was necessary to find out what measures have been put in place to curb IUU.
- v. There has been declining fish stocks in marine shallow and inland waters. Artisanal fishermen from marine regions have been complaining of reduction in fish catch from a high of 90kgs per day previously to a low of 40kgs currently. This decline in daily catch has negatively impacted on their income.
- vi. The Government's budgetary allocation to the fishing sector over the last five years stood at Kshs.11.4 billion. With the significant allocation, an audit of the

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<sup>2</sup> <https://www.knbs.or.ke/wp-content/uploads/2021/09/Economic-Survey-2021.pdf>

Sector was necessary to establish whether the funds have been used for the intended purpose.

## 2.0 DESIGN OF THE AUDIT

### Audit Objective

2.1 The audit assessed how the Kenya Fisheries Service is managing, conserving and developing fisheries in order to ensure adequate supply of fish in the country.

The specific objectives of the audit were to assess whether KeFS: -

- a) Has put in place measures to ensure that fishermen have adequate capacity to undertake deep sea fishing;
- b) Has put in place measures to minimize on postharvest losses;
- c) Has put in place measures to mitigate declining fish stocks in marine and inland waters; and
- d) Has put in place measures to combat illegal, unreported and unregulated fishing.

### Audit Scope

2.2 The audit assessed how the Kenya Fisheries Service is managing, conserving and developing fisheries in order to ensure adequate supply of fish in the Country.

The audit covered a period of five financial years; 2017/2018 to 2021/2022. Data for the audit was gathered at KeFS headquarters in Nairobi and its seven regional offices in Mombasa, Kwale, Kilifi, Kisumu, Busia, Naivasha and Turkana. The audit was carried out between January and November, 2022.

### Methods Used to Gather Data

2.3 The audit was conducted in accordance with International Standards of Supreme Audit Institutions (ISSAIs) issued by the International Organization of Supreme Audit Institutions (INTOSAI), the Office of the Auditor General, Kenya Performance Audit manual and other established audit procedures.

The methods used to gather audit evidence are outlined below: -

#### i. Document review

Various documents were reviewed to gain an understanding of the audit entity and its stakeholders. These included; the Fisheries Management and

Development Act No.35 of 2016, KeFS Strategic Plan for the period 2018 to 2020, Frame survey and KMFRI research reports. A detailed list of the reviewed documents and purpose for the review is detailed out in [Appendix 1](#).

## ii. Interviews

The team interviewed officers in charge of various departments at KeFS, beach management unit officials and its members. The Officers from KeFS included the directors in the capture fisheries, fish quality, safety and assurance as well as the regional directors. A detailed list of the persons interviewed and purpose for the interviews is detailed out in [Appendix 2](#).

## iii. Physical inspection

The team undertook inspection of infrastructure at the sampled regions at the Beach Management Units (BMUs) and landing sites. In addition, the team carried out physical verification of the equipment at the three laboratories in Nairobi, Kisumu and Mombasa.

## Sampling and Sample Size

2.4 The team used purposive sampling<sup>3</sup> to select the regional offices to be visited for infrastructure verification during the audit. The sampled regions are as shown in **Table 1**.

2.5 Across all the regions, Illegal, Unreported and Unregulated (IUU) fishing was on the rise despite measures put in place to curb it. Therefore, the indicator was adopted as it applied to all the regions. Increased IUU led to decline in fish stocks, thereby undermining the adequacy of fish in the Country. The team used convenient sampling<sup>4</sup> to select 18 BMUs as shown in [Appendix 3](#).

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<sup>3</sup> Purposive sampling refers to sampling method where the auditor uses professional judgement to obtain units for inclusion in the study. The units selected are usually those that the auditor feels meet the criteria set for sampling

<sup>4</sup> Convenient sampling refers to choosing the nearest and most convenient to act as respondents.

**Table 1: Sampled Regional Offices**

Regional Office	Reason for its Selection
Marine and Coastal Office	The regional office oversees the management of fishing activities in the Indian Ocean. Kenya's deep-sea fishing has not been fully exploited as it currently produces 25,000 metric tonnes annually, against its available estimated optimal capacity of 300,000 metric tonnes. The regional office also has a Vessel Monitoring System (VMS) for monitoring Kenya's Exclusive Economic Zone (EEZ) to deter Illegal, Unreported and Unregulated (IUU) fishing.
Central and South Rift Office	The regional office oversees fishing operations in Lake Naivasha, a Ramsar site, one of the wetland areas in the world of international significance. Ramsar sites are wetlands of international importance that have been designated under the criteria of the Ramsar Convention on Wetlands for containing representative, rare or unique wetland types or for their importance in conserving biological diversity.
Lake Victoria and Western Office	The regional office oversees the management of Lake Victoria which contributes 70% to Kenya's annual fish production valued at approximately Kshs. 16.1 billion.
Lake Turkana	The lake produces 13,000 metric tonnes of fish but has the potential to produce up to 35,000 metric tonnes annually. However, postharvest losses stand at 70% of the catch. This is occasioned by a lack of cold storage facilities and challenges in accessing markets.

### Assessment Criteria

2.6 The audit assessment criteria were drawn from various sources as detailed out below.

### Fish Inspection and Quality Assurance

2.7 According to Regulation 19 of the Fisheries (Safety of Fish, Fishery Products and Fish Feed) Regulations, 2007, inspections for official control of fish, fishery products and fish feed shall be carried out as follows:

- i. Regularly and according to priorities determined by risk assessment carried out by the competent authority designated to under regulation 4 of the Act;
- ii. When non-compliance is suspected; and
- iii. When required for the purposes of certification.

2.8 Inspection shall cover all stages of production, culture, handling, manufacture, processing, packaging, storage, transport, distribution, retail and wholesale trade export and import of fish, fishery products and fish feeds. According to Part 4.5.1 of the Manual of Standard Operating Procedures for Fish Inspection and Quality Assurance, fish will be sampled from all boats that arrive at the site.

#### **Development of Regulations**

2.9 Section 208 (1) of the Fisheries Management and Development Act, 2016 provides that the Cabinet Secretary responsible for the Fisheries Sector may make regulations for the better carrying into effect of the provisions of this Act.

#### **Data Collection and Analysis**

2.10 Section 9 (h) of the Fisheries Management and Development Act, 2016 provides for KeFS to collect and analyse data in relation to resources and activities falling within the scope of the Act.

#### **Licensing**

2.11 According to Section 84 (1)(c) and (e) of the Fisheries Management and Development Act, 2016, a valid and applicable license issued in accordance with section 92 of the Act shall be required for using an artisanal fishing vessel for commercial purposes and such other activity or activities within the scope of the Act.

#### **Vessel Monitoring System**

2.12 Section 157 (1) of the Fisheries Management and Development Act, 2016 stipulates that the Director-General may establish and operate vessel monitoring systems for purposes of monitoring, control and surveillance and managing the operations of fishing vessels under the Act.

#### **Monitoring, Control and Surveillance**

2.13 Section 20 (1) and (2) of the Fisheries Management and Development Act, 2016 states that the Monitoring, Control and Surveillance (MCS) Unit established in KeFS shall have the following functions: -

- a) Monitoring, control and surveillance, including enforcement and compliance with the Act and any other legislation relating to activities falling within the scope of the Act;

- b) Performing relevant functions within the broader system of monitoring, control and surveillance at bilateral, sub-regional, regional and international levels to implement agreements or measures which are binding upon Kenya or which the Cabinet Secretary, as appropriate in consultation with the Cabinet Secretaries responsible for internal security and defense, directs subject to the Treaty Making and Ratification Act, 2013.

## 3.0 DESCRIPTION OF THE AUDIT AREA

### Kenya Fisheries Service

3.1 The Kenya Fisheries Service is a corporate body established under the Fisheries Management and Development (FMD) Act No. 35 of 2016. The purpose of the Kenya Fisheries Service is to conserve, manage and develop Kenya fisheries and aquaculture resources. KeFS is also guided by the Maritime Zones Act, Cap 371 of 1989. The Maritime Zones Act is an Act of Parliament to consolidate the law relating to the territorial waters and the Continental Shelf of Kenya to provide for the establishment and delimitation of the Exclusive Economic Zone of Kenya. Further, the Maritime Zones Act provides for the exploration, exploitation, conservation and management of the resources of the maritime zones and for connected purposes.

### Functions of the Kenya Fisheries Service

- 3.2 In line with the mandate of KeFS, its main functions are to:
- a) Ensure the appropriate conservation, development of standards on management, sustainable use, development and protection of the fisheries and aquaculture resources;
  - b) Formulate and monitor the implementation of policies regarding the conservation, management and utilization of all fisheries and aquaculture resources;
  - c) Develop standards for the management of all fisheries and aquaculture activities and fishing related activities;
  - d) Provide education to create public awareness and support for fisheries conservation, management, development and sustainable use;
  - e) Set and meet goals for fisheries conservation, management, development and sustainable use;
  - f) In consultation with the Kenya Marine and Fisheries Research Institute, approve and coordinate research activities;
  - g) Collect and analyze data in relation to resources and activities; identify manpower requirements and recruit manpower at all levels for the Service;

- h) Liaise as appropriate with agencies and persons, including stakeholders, industry, government agencies, regional and international organizations and experts, whether local or foreign;
- i) Subject to the Public Health Act and the Food, Drugs and Substance Act, control and regulate fish safety and quality;
- j) Undertake the development of appropriate fisheries and aquaculture resources infrastructure, that relates to its mandate under this Act and the Constitution;
- k) Facilitate investment in commercial fisheries, in collaboration with relevant agencies, persons or bodies, including Government departments;
- l) Promote development and introduction of appropriate technologies in aquaculture production, processing and preservation in collaboration with relevant agencies, county governments and stakeholders;
- m) Identify and promote construction of any works deemed necessary for the sustainable development and economic utilization of fisheries and aquaculture resources;
- n) Co-ordinate fish quality assurance and operations of the marine and coastal fisheries, aquaculture and inland and riverine fisheries;
- o) Coordinate and or undertake monitoring, control and surveillance of all activities; and
- p) Perform such other duties and functions consistent with the provisions of the FMD Act, 2016.

- 3.3 To achieve its mandate, KeFS is guided by the following strategic objectives:
- a) To manage and protect fisheries resources and the aquatic environment;
  - b) To facilitate increased national fish production to enhance food and nutrition security in the country;
  - c) To create a conducive environment for increased investment and employment opportunities in fisheries, aquatic resources and related industries;
  - d) To improve quality and safety of fish and fishery products and minimize postharvest losses: and
  - e) To strengthen institutional structure and capacity.

## Organization Structure

3.4 The Management of the KeFS is vested in the Board of Directors who provide for policy and oversight while the day-to-day operations are delegated to the Director General.

3.5 The Kenya Fisheries Service is organized into six directorates, namely:

- a) Capture Fisheries;
- b) Aquaculture;
- c) Fish Quality, Safety and Trade;
- d) Corporation Secretary and Legal Service;
- e) Corporate Services; and
- f) Kenya Fishing School.

## Capture Fisheries Directorate

3.6 The directorate develops, implements and reviews policies, standards and guidelines regarding the conservation, management, sustainable use, protection and utilization of capture fisheries resources. Capture fisheries refer to all kinds of harvesting of naturally occurring living resources in both marine and fresh water environment. The main functions of the directorate include:

- Implement and review policies, standards and guidelines regarding the conservation, management, sustainable use, protection and utilization of capture fisheries resources;
- Create public awareness and support for fisheries conservation, management, development and sustainable use;
- Collect and analyse data and disseminate information on capture fisheries resources;
- Collaborate with county, national, regional and international stakeholders on conservation and management of fisheries resources;
- Develop or advise on appropriate capture fisheries resources infrastructure that relates to the mandate under the Fisheries Management and Development (FMD) Act No.35 of 2016 and the Constitution;

- Promotion of the development of traditional and industrial fisheries and related industries;
- Collaborate with the Kenya Marine and Fisheries Research Institute and other research institutions in capture fisheries research;
- Protect areas declared as national sanctuaries to enhance brood and spawn of nominated species;
- Identify research priorities in fisheries;
- Coordinate and or undertake Monitoring Control and Surveillance within the scope of the FMD Act, 2016; and
- Develop guidelines for the preparation of fisheries management plans for the Kenya fishery waters.

3.7 Further, the Directorate has the following departments; Fisheries Management and Operations and Fisheries Compliance and Enforcement.

#### **Aquaculture Directorate**

3.8 The department initiates the development of policies, standards, guidelines, plans and regulations governing aquaculture activities and collaborates with county governments and relevant bodies on sustainable aquaculture development. Aquaculture refers to the farming of water dwelling organisms in controlled or semi controlled environments to enhance productivity. These organisms include fish, molluscs, crustaceans, aquatic plants, among others. The functions of the directorate include:

- Collaborate with county governments and relevant bodies on sustainable aquaculture development;
- Develop and maintain a register of aquaculture establishments;
- Monitor and regulate live fish movements;
- Develop fish disease surveillance and control mechanism;
- Promote adoption of appropriate technologies in aquaculture production and value chain;
- Collect, analyse and disseminate aquaculture information in collaboration with relevant stakeholders;

- Strengthen national stakeholder fora and networks for aquaculture development;
- Identify research priorities in aquaculture;
- Identify investment opportunities in commercial aquaculture;
- Development of gene bank, germ plasm and standards for quarantine facilities;
- Coordinate aquaculture development institutional framework;
- Domesticate regional aquaculture policies;
- Develop technologies for seed bulking; and
- Develop seed certification guidelines.

3.9 The Directorate is organized into two departments; The Innovation and Technology and Genetic and Breeding.

#### **Fish Quality, Safety and Trade Directorate**

3.10 The directorate develops, implements and reviews policies, standards and guidelines on fish safety, quality, utilization and trade. Further, the directorate is organized into three departments, namely: Fish Quality Assurance and Inspection, Standards and Trade and Fish Laboratories.

#### **Standards and Trade Department**

3.11 The department initiates the development of standards and guidelines on fish for market access and enforce sanitary and Phyto-sanitary requirements for fisheries and aquaculture and issuance of export and import permits for fish and fishery products.

#### **The Kenya Fisheries Service Regional Offices**

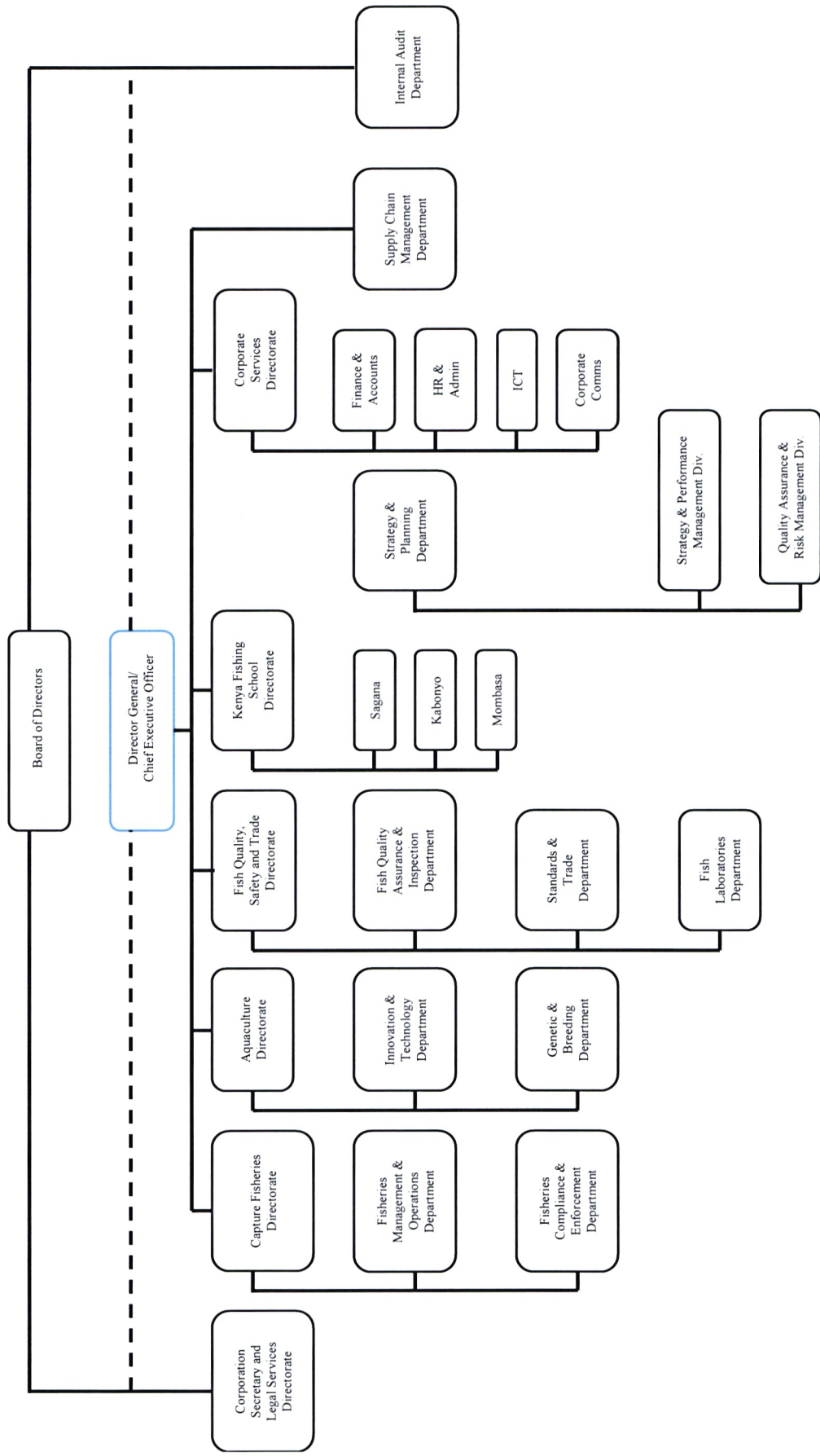
3.12 The Kenya Fisheries Service has nine regional offices located in Nairobi, Mombasa, Kisumu, Turkana, Uasin Gishu, Nakuru, Embu, Garissa, Kakamega and Nyeri. The regional offices are as detailed below:

- i. Marine and Coastal Region (Capture, Aquaculture, FIQA)-Mombasa, Kwale, Kilifi, Tana River, Lamu and Taita Taveta Counties;

- ii. Lake Victoria Region (Capture, Aquaculture, FIQA)-Siaya, Kisumu, Homa Bay, Migori, Kisii and Nyamira;
- iii. Lake Turkana Region (Capture and FIQA)-Turkana, Marsabit and Samburu Counties;
- iv. North Rift Region (Capture, Aquaculture and FIQA)- Uasin Gishu, Trans Nzoia, Nandi, West Pokot and Elgeyo Marakwet Counties;
- v. Central and South Rift Region (Capture, Aquaculture and FIQA)-Baringo, Nakuru, Bomet, Kericho, Narok, and Laikipia Counties;
- vi. Central Region (Aquaculture and FIQA)-Nyeri, Kirinyaga, Nyandarua, and Murang'a Counties;
- vii. Eastern Region (Capture, Aquaculture, and FIQA)-Isiolo, Meru, Embu, Tharaka Nithi, Makueni, Kitui and Machakos Counties;
- viii. Nairobi Metropolitan Region (FIQA, Aquaculture, and Capture)- Nairobi, Kiambu, and Kajjado Counties; and
- ix. Western Region (Aquaculture, FIQA, and Capture)-Kakamega, Bungoma, Busia and Vihiga Counties.

3.13 The Kenya Fisheries Services organization structure is detailed in **Figure 1**.

**Figure 1: Kenya Fisheries Service Organization Structure**



## Key Players in the Management of Fishing Activities

3.14 The Kenya Fisheries Service has the responsibility to manage, conserve and develop fisheries and aquaculture resources in Kenya. Other agencies that have key roles in conservation and management of the fishery resources are as discussed below.

### The Kenya Coast Guard Service

3.15 This is a specialized maritime force responsible for law enforcement on national waters, including on the oceans, lakes and rivers. The force is mandated to maintain maritime safety, security, pollution control and sanitation<sup>5</sup>. The Kenya Coast Guard Service assists KeFS in the enforcement and fight against Illegal, Unreported and Unregulated (IUU) fishing.

### The Kenya Marine and Fisheries Research Institute

3.16 The state corporation was established in 1979 by the Science and Technology Act, Cap 250, which has since been repealed by the Science, Technology and Innovation Act No. 28 of 2013. Its mandate is to undertake research in marine and freshwater fisheries, aquaculture, environmental and ecological studies, and marine research including chemical and physical oceanography, in order to provide scientific data and information for sustainable development of the blue economy<sup>6</sup>.

### The Kenya Maritime Authority

3.17 The Kenya Maritime Authority (KMA) was set up in June 2004 as the semi-autonomous agency in charge of regulatory oversight over the Kenyan maritime industry. One of its core functions is maritime safety and security. KMA strengthens national maritime administration through; enhancement of regulatory and institutional capacities for safety and security, fostering effective implementation of international maritime conventions and other mandatory instruments on safety and security, promoting maritime training, coordinating search and rescue, preventing marine pollution and promoting preservation of the marine environment, as well as

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<sup>5</sup> <https://kcs.go.ke/about-us/>

<sup>6</sup> <https://www.kmfri.co.ke/index.php/about-us/mandate-of-the-institute>

promoting trade facilitation and maritime investments<sup>7</sup>.

### The Bandari Maritime Academy

3.18 The Bandari Maritime Academy was developed to address changes in the maritime sector and to meet the growing skill demands for this sector and the blue economy. It was developed under the eighth sector of the economic pillar in the Medium-Term Plan (III) of the Kenya Vision 2030<sup>8</sup>. The academy has two training departments, namely:

- **The Department of Port Operations:** The department offers programmes related to the Kenya Ports Authority, such as cargo handling, documentation and management: and
- **The Department of Maritime Education and Training:** Under this department, there are three schools; the School of Marine Engineering, School of Nautical Science, Standards of Training, Certification and Watch Keeping (STCW) and auxiliaries and the School of Commercial Diving.

### Beach Management Units

3.19 This is the organization of fisher folk at the beach, including; boat crew, boat owners, managers, charterers, fish processors, fish mongers, local gear makers or repairers and fishing equipment dealers within a fishing community. Beach Management Units act as a focal point that enable service providers to build awareness and capacity across a wide variety of issues on fishing activities.

3.20 Beach Management Units (BMUs) ensure that the knowledge and understanding of all stakeholders are reflected in the decision-making and their diverse capacities are harnessed in implementation of fishing activities. This has the potential to improve the sustainability of fisheries resource exploitation and increase the efficiency of management of fishing activities.

3.21 It is the responsibility of BMUs to ensure that all data regarding fish catch is collected upon landing. In addition, KeFS collaborates with BMUs and other stakeholders such as the KMFRI and the Kenya Coast Guard Service to create

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<sup>7</sup> <https://kma.go.ke/kenya-maritime-authority-overview/>

<sup>8</sup> <https://bma.ac.ke/background/>

awareness and aid in monitoring, control and surveillance. Further, BMUs assist in data collection for Frame Surveys and Catch Assessment Surveys. In collaboration with Kenya Marine and Fisheries Research Institute KMFRI and KeFS, Beach Management Units assist in identifying fish breeding areas based on indigenous knowledge and demarcate prohibited fishing zones.

## Description of Fishing Activities

### Deep Sea Fishing

3.22 Deep sea fishing is the activity of catching fish that live in the deep parts of the sea.

To undertake deep sea fishing, fishermen are required to have industrial and semi-industrial vessels such as purse seiners, long liners and prawn trailers. The vessels have the capability of venturing off the reefs and are large enough to undertake fishing even when the sea is rough. Some initiatives towards increasing deep-sea fishing in Kenya include:

- The gazettelement of Liwatoni fishing complex in Mombasa County as a fishing port; and
- The Presidential directive of training youth on deep sea fishing. It is a five-year initiative that aims to equip the youth with fishing skills, as well as capacity building on fishing activities. The sea safety course equips the trainees to handle challenges at sea, such as wave turbulence while undertaking deep sea fishing.

3.23 The training program ensures that fishermen are equipped with the skills required to undertake deep sea fishing. The training comprises four phases as shown below.

- **Phase I:** Five-day theoretical training on sustainable fisheries management conducted and facilitated by KeFS and the Kenya Marine and Fisheries Research Institute officers.
- **Phase II:** A five-day shallow water fishing practical training facilitated by KeFS, the concerned county government and the Kenya Marine and Fisheries Research Institute officers.
- **Phase III:** A 10-day training on Standards of Training Certification and Watch Keeping (STCW) at Bandari Maritime Academy. This is a mandatory course for anyone working in sea vessels. The course is regulated and approved by

the International Maritime Organization. Kenya is allowed to train students in the course in collaboration with the Kenya Maritime Authority; the local sector regulator. The certificate attained upon completion expires after a period of five years and must be revalidated at a cost of Kshs. 20,000. The course includes; Fire prevention and firefighting, personal survival techniques, elementary first aid, ship security awareness and personal safety and social responsibility

- **Phase IV:** A 10-day practical course on deep-sea fishing. This is spearheaded by KMFRI. The trainees are trained while on board fishing vessels in order to gain on the job experience.

### Post-Harvest Losses

3.24 Post-harvest losses are defined as a reduction in quantity, quality or monetary value of fish in the supply chain. They occur in all fisheries or value chains to varying extents. Losses typically result in lost income and a loss in the availability of fish as food, hence they represent a major food security concern in Kenya.<sup>9</sup>

3.25 In order to minimize post-harvest losses, a landing site should have the following infrastructure; bandas, cold rooms, drying racks, smoking kilns, public fish store, jetty, pontoon, electricity, public toilet, potable water, all-weather roads and be fenced. In addition, other supplementary infrastructure are net repair facilities, craft and engine repair facilities, fish gear shop and a Beach Management Unit (BMU) office.<sup>10</sup>

3.26 In an effort to minimize post-harvest losses, KeFS is required to undertake inspections on fishing vessels, freezer vessels, factory vessels, fish landing facilities, fish transport vessels, fish cold storage facilities, aquaculture facilities, fish processing establishment, ice plants and fish outlets<sup>11</sup>. During inspection, sensitization of fishermen and business operators on proper fish handling should be carried out in order to capacity build them on how to minimize post-harvest losses.

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<sup>9</sup> <https://www.fao.org/3/bs226e/bs226e.pdf>

<sup>10</sup> Lake Victoria Frame Survey Report, 2020

<sup>11</sup> Manual of Standard Operating Procedures for Fish Inspection and Quality Assurance in Kenya, June 2015

## Declining Fish Stocks

3.27 Declining fish stock is a reduction of the fisheries resource through overfishing, it prevents the realization of the maximum productive activity of a fishery resource.<sup>12</sup>

Some of the measures to conserve and manage the fishery resources include:

- Imposing closed seasons: A period in the year when fishing is officially forbidden;
- Demarcation of prohibited fishing areas such as breeding sites;
- Limitations on the types of gear that may be used for fishing such as the net mesh size, types and the number of fishing vessels and the amount, size and age of fish that may be caught;
- Conducting research and surveys;
- Restocking waters with fish; and
- Promoting the adoption of alternative means of livelihood amongst fishermen.

3.28 Assessments of the level of resource exploitation are conducted by stakeholders such as KMFRI. Research by KMFRI outlines the Maximum Sustainable Yield (MSY)<sup>13</sup> for given fish stock in marine and inland waters.<sup>14</sup> In addition, data from catch assessment surveys provide useful information that informs on fishery resources and understanding the impact of increased fishing activities.

3.29 Further, frame surveys are conducted to avail accurate and regularly updated information for policy, management, decision-making and providing sampling frames for various research activities. The overall objective of frame surveys is to establish the fishing effort in terms of numbers of fishermen, number of fishing vessels and the type of fishing gear used. The survey, provides information on the facilities and services at landing sites and the composition, magnitude and distribution to guide the development and management of the fisheries resources.

## Illegal, Unreported and Unregulated Fishing

3.30 Illegal fishing includes activities conducted by national or foreign vessels in waters under the jurisdiction of a state without its permission or in contravention of its laws and regulations. Unreported fishing includes activities which the relevant authority

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<sup>12</sup> [https://doi.org/10.1577/1548-8659\(1946\)76\[283:ADODOF\]2.0.CO;2](https://doi.org/10.1577/1548-8659(1946)76[283:ADODOF]2.0.CO;2)

<sup>13</sup> This is the highest possible annual catch that can be sustained over time by keeping the stock at the level producing maximum growth.

<sup>14</sup> [http://awsassets.panda.org/downloads/wwf\\_msy\\_oct2011\\_final.pdf](http://awsassets.panda.org/downloads/wwf_msy_oct2011_final.pdf)

has not been notified. Unregulated fishing includes activities conducted by vessels without nationality or by those flying the flag state not party to that organization or by a fishing entity in a manner that is not consistent with conservation and management measures.

3.31 The Kenya Fisheries Service enforces measures such as monitoring, control and surveillance in order to reduce IUU fishing. These include the collection, measurement and analysis of data on fishing activities. This information specifies how fisheries resources can be harvested by fishermen and all license holders in compliance with regulations put in place by KeFS.

3.32 In the year 2017, under the Kenya Coastal Development Project (KCDP), the Government procured a Vessel Monitoring System to effectively monitor the operations of fishing vessels in the deep sea. The system is used to collect data on the operations of vessels in the ocean, such as fishing routes and patterns. The monitoring system runs on a platform known as Themis which has the following modules.

- Vessel Monitoring System (VMS): Receives and displays tracking signals of licensed fishing vessels. It assists KeFS to monitor the area under its management and provides information on the vessels' speed, patterns and movement. It also assists in data collection on fish catch.
- Automatic Identification System (AIS): Receives and displays tracking signals of all vessels, fishing and non-fishing vessels, with AIS transponders. AIS as a surveillance tool can be used to monitor the real-time movement of vessels through the fishing waters. It also contributes significantly to the safety of navigation, as it improves the safety of fishermen and fishing vessels.
- Satellite Radar Imagery (SRI): Satellites take aerial pictures of the ocean, thereby enabling KeFS to identify dark vessels.
- Oceanographic Module: The system provides real-time comprehensive data on ideal oceanographic conditions for the presence of fish in order to anticipate and identify fishing areas. This reduces negative environmental impact, delays and costs associated with navigation. This may help KeFS track areas with higher fish quantities that need close monitoring, as fishermen frequent such areas.

## 4.0 AUDIT FINDINGS

4.1 Kenya's current national annual fish production is at 149,700 metric tonnes. The per capita fish consumption is 4kgs, whereas the Africa average is 10kgs and the global average is 20kgs. There has been a campaign by the Kenya Fisheries Service, towards encouraging Kenyans to consume more fish, in a bid to increase the per capita consumption. However, the current production does not meet the increased demand for fish in the country. The inadequate production of fish in Kenya is attributed to under exploitation of deep-sea fishing, post-harvest losses, declining fish stocks and illegal, unreported and unregulated fishing. The findings of the audit are detailed below: -

### A. The Country has not Exploited Its Full Potential for Deep Sea Fishing

4.2 Deep sea fishing is the activity of catching fish that live in the deep parts of the sea. The Country has been exploiting about 25,000 metric tonnes of fish in marine waters. If fully exploited, deep sea fishing has the potential to increase fish production to 300,000 metric tonnes valued at Kshs. 42 billion.

4.3 The audit established that there was under exploitation of deep-sea fishing in the Indian Ocean. This was attributed to the fact that most fishermen are artisanal and do not engage in deep sea fishing. The inability to undertake deep sea fishing was attributed to lack of skills, appropriate vessels and equipment, as discussed below.

#### i. Inadequate Skills to Undertake Deep Sea Fishing

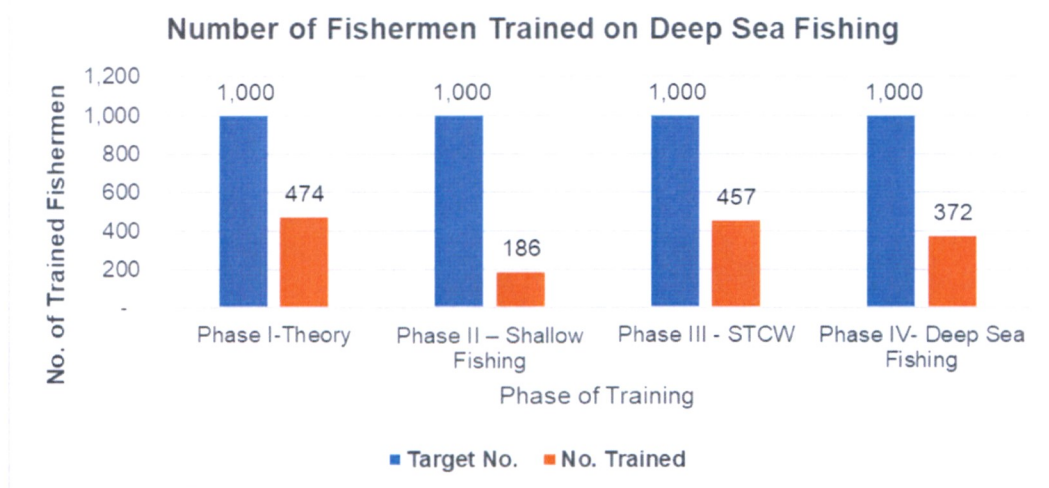
4.4 According to KeFS Strategic Plan, 2018 to 2022, education, training and skills development are its key strategic focus areas whose objective is to build capacity in fisheries and aquaculture. Further, one of the objectives of the Concept Note on Capacity Building for the Deep-Sea Marine Capture Fishery, September 2020, was to increase job and employment opportunities for Kenyans on board ships nationally, regionally, internationally and along the fish value chain.

4.5 The Kenya Fisheries Service, in collaboration with its stakeholders has trained artisanal fishermen on deep sea fishing. The training was focused on four areas: fisheries management; shallow water fishing practical; Standards of Training,

Certification and Watch Keeping (STCW); and the practical component of deep-sea fishing.

- 4.6 The training targeted to train 1,000 fishermen annually. However, a progress report dated 07 July, 2022 on fish crew training, indicated that only 372 fishermen had successfully completed all the four training phases since its inception in 2021. **Figure 2** details the number of fishermen trained on the four areas as at the time of the audit. A detailed analysis of the trained fishermen in each of the sampled areas is in [Appendix 4](#).

**Figure 2: Number of Fishermen Trained on Deep Sea Fishing**



*Source: OAG analysis of progress reports on deep sea fishing training*

- 4.7 Subsequently, a status report on Fish Crew Training dated 03 November, 2022 indicates that KeFS trained an additional number of fishermen; 524 for phase I, 460 for phase II, 506 phase III and 447 for phase IV.
- 4.8 Failure to train the targeted number of fishermen was attributed to the inability of Beach Management Units to nominate members to KeFS for subsequent submission of the names to Bandari Academy for training. As a result, Bandari Maritime Academy (BMA) could not utilize an amount of Kshs.25.7 million earmarked for training from an allocation of Kshs.42.5 million for training fishermen on deep sea fishing, despite the need to train more fishermen.

4.9 Review of the Marine Artisanal Fisheries Frame Survey Report, 2016, revealed that the total number of fishermen in the Coast region was 13,426, of which only 372 fishermen had trained on deep sea fishing by July 2022. Therefore, there was a gap of 13,054 untrained fishermen who could not undertake deep sea fishing due to lack of skills. Further, as at the time of the audit, only 5 out of the 372 trained fishermen had been employed in the marine industry. None of the trained fishermen was undertaking deep-sea fishing as they were yet to secure employment opportunities aboard commercial vessels. As a result, the skills acquired on deep sea fishing were not being put into use and did not translate into the country increasing its capacity to undertake seep sea fishing. In addition, there is no value for money for the Government investment of over Kshs.150 million in training them on deep sea fishing.

4.10 Upon successful completion of deep-sea fishing, trainers are issued with a Seaman's Book that is valid for 5 years. Failure to secure employment onboard commercial vehicles might result into expiry of the license before being put into use. Upon expiry, the Seaman's Book is renewable after a mandatory refresher course that costs Kshs.21,000.

#### **ii. Lack of Appropriate Vessels and Equipment to Undertake Deep Sea Fishing**

4.11 According to KeFS Strategic Plan, 2018 to 2022, strategic focus area 3, one of the strategies is to develop capacities and fisheries facilities by developing domestic deep-sea fishing fleets and sea-going capacity such as navigation aids, Global Positioning System (GPS), engineering and safety equipment.

4.12 In order to undertake deep sea fishing, fishermen require to have appropriate vessels and equipment, including; purse seiners, long liners and prawn trailers. Interviews with KeFS and Beach Management Units revealed that fishermen did not have appropriate vessels to undertake deep-sea fishing. Consequently, they could only undertake fishing in shallow waters using dug-out canoes and small boats.

4.13 The inability for fishermen to acquire vessels for deep-sea fishing was attributed to the high initial cost outlay of deep-sea vessels. For instance, the total cost of a fully equipped semi-industrial vessel is estimated at Kshs.1.3 million, which is way beyond the affordability of local fishermen. Further, the approximate cost of an

industrial vessel is from Kshs. 200 million and above, depending on its size and the equipment installed.

4.14 Document review of KeFS list of licensed vessels for the year 2021 revealed that the Government does not own any vessels that can undertake deep-sea fishing. Therefore, most of the commercial vessels undertaking deep-sea fishing in the marine waters are owned by foreign investors, with only two Kenyans having invested in deep sea fishing.

4.15 Further, one of the objectives of the Concept Note on Capacity Building for the Deep-Sea Marine Capture Fishery, September 2020 was to increase the number of locally flagged fishing vessels exploiting fish stocks in the Indian Ocean and other seas. The concept note indicates that Kenya is required to develop its national fleet and envisions to have 18 purse seiners and 55 long liners by the year 2025. However, as at the time of the audit on 06 September, 2021, Kenya did not have any purse seiners. Document review also revealed that 6 long liners and prawn trawlers operate in Kenya but have expired licences.

4.16 As a result, the Kenyan Exclusive Economic Zone (EEZ) remains unexploited by Kenyan vessels, leading to inadequate supply of fish in the country. According to a KMFRI report, 2018, under exploitation of the EEZ results into the country having an opportunity loss of up to Kshs.15 billion annually<sup>15</sup>.

4.17 In addition, fishermen lacked equipment required for deep-sea fishing, which includes marine compasses, GPS<sup>16</sup>, navigation lights, life jackets, radio transmission systems and first aid kits, among others.

## **B. Fishermen Experiencing Post-Harvest Losses**

4.18 Post-harvest loss is a reduction in quantity, quality or monetary value of fish in the supply or value chain. As a result, fish is either discarded or sold at a relatively low price. Interviews with KeFS officials across all the sampled regional offices established that fishermen experienced post-harvest losses. Review of a technical

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<sup>15</sup> Fisheries Task Force Report, 2010, KMFRI 2018

<sup>16</sup>The Global Positioning System (GPS) is a U.S.-owned utility that provides users with positioning, navigation, and timing (PNT) services.

report by KMFRI <sup>17</sup> revealed that 97% of fish traders or processors and 75% of fishermen from the Lake Victoria region experienced post-harvest losses. Further, the *Rastrineobola Argentea* (Omena) species loss was estimated to be at between 20% to 40% of the catch, approximately valued at Kshs.3.7 billion per annum.

4.19 Review of a similar technical report for the Lake Turkana region <sup>18</sup> revealed that post-harvest losses arising from physical, quantity, quality and market forces were estimated at over 35% of fish catch. The post-harvest losses were attributed to the factors detailed out below: -

**i. Beach Management Units Not Observing Hygienic and Sanitary Requirements**

4.20 According to Part 4.3 of the Manual of Standard Operating Procedures for Fish Inspection & Quality Assurance, 2015, fish should be handled in accordance with the set hygienic and sanitary requirements. The Manual require that all fish handlers should maintain a high degree of personal health and take all the necessary precautions to prevent contamination of fish.

4.21 Physical inspection at the 18 sampled landing sites and BMUs revealed that fishermen and fish traders did not handle fish in a hygienic manner. For instance, during physical verification, the audit established that Marenga Omena, Asat, Bao and Rare Landing Sites sun dried *Rastrineobola Argentea* (Omena) and Tilapia on bare ground as opposed to using fish drying racks. This resulted in instances where fish handlers were stepping on the fish being dried on the ground. At Kibuyuni BMU, physical verification revealed that fish catch was placed in dirty basins and washed with ocean water, instead of potable running water as required. Consequently, there was an increased risk of the fish being contaminated, leading to a reduction in its quality, which contributes to increased post-harvest losses. **Figure 3** illustrates improper handling of fish in the sampled BMUs.

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<sup>17</sup> A Technical Report on the Post-Harvest Losses Assessment of One Major Commercial Fish (*Rastrineobola Argentea*, Omena) in Lake Victoria, May 2021.

<sup>18</sup> A Technical Report on Post-harvest Losses Assessment of one Major Commercial Fish in Lake Turkana, May 2021

**Figure 3: Improper Handling of Fish at Beach Management Units**



**Source:** Photos taken by the audit team during field visits

**Key clockwise:** Fish in an unhygienic basin in Kibuyuni BMU, fish being sun dried on bare ground at Kalokol BMU and fish landed on the ground at Marenga BMU.

4.22 The Manual on Standard Operating Procedures for Fish Inspection & Quality Assurance, 2015, require that potable water should be used to clean fish, working surfaces, display counters and equipment. The audit established that the sampled BMUs did not observe this sanitary requirement. For instance, out of the 18 sampled landing sites, 17 did not have potable water, 13 did not have clean working surfaces, 14 did not have clean floors and weighing scales, 15 did not have clean display counters while all the 18 landing sites did not have clean equipment. A summary on the number of landing sites and BMUs observing sanitary requirements is shown in **Table 2** and **Appendix 5**, respectively.

**Table 2: Summary of Sanitary Requirements in the Sampled Landing Sites**

Name Region	of	Number of Sampled Landing sites	Number of Landing Sites Observing Sanitary Requirements					
			Potable water	Clean Working Surfaces	Clean Floors	Clean Display Counters	Clean Equipment	Clean Weighing Scales
Kisumu		4	1	2	1	1	0	1
Busia		2	0	1	1	0	0	0
Mombasa		3	0	0	3	0	0	1
Kwale		3	1	0	0	0	0	2
Malindi		3	1	2	2	2	0	0
Naivasha		2	1	0	0	0	0	0
Turkana		1	0	0	0	0	0	0
Total		18	1	5	7	3	0	4

Source: OAG analysis of data on sanitary requirements in landing sites

4.23 Failure to adhere to the sanitary requirements leads to improper fish handling, thereby contributing to post-harvest losses.

#### ii. Fishing Vessels Without Cooler Boxes and Ice Flakes

4.24 Cooler boxes and ice flakes are essential as they are used to preserve and maintain fish quality in order to curb post-harvest losses. According to Part 4.3 of the Manual on Standard Operating Procedures for Fish Inspection & Quality Assurance, 2015, fish to flake ice ratio in fishing vessels should be 1:1. Further, Part 5.14 of the Manual stipulates that cold storage facilities or cooler boxes will be provided to preserve surplus fish.

4.25 Physical inspection at the 18 sampled landing sites revealed that none of the fishermen had cooler boxes with ice flakes in their vessels. Interviews revealed that fishermen did not have access to ice flakes as none of the sampled landing sites had ice plants. Further analysis revealed that 8 out of 18 landing sites had access to ice flakes from private vendors, as detailed in [Appendix 6](#). However, factors such as long distances to the private vendors and high cost of ice flakes deterred fishermen from using the ice flakes for preservation of fish. Failure to have cold storage facilities onboard vessels resulted in contamination of fish and deterioration in fish quality, leading to post-harvest losses.

#### iii. Inadequate Sensitization on Fish Handling Practices

4.26 According to Section 9 (e) of the Fisheries Management and Development Act, 2016, one of the functions of KeFS is to provide education in order to create public

awareness to support fisheries conservation, management, development and sustainable use.

4.27 The audit established that there was inadequate awareness creation on fish handling practices in all the seven sampled regions. This was attributed to KeFS not having adequate staff to undertake the activity as shown in **Table 3**.

**Table 3: Number of Fisheries Officers Versus Landing Sites**

Name of Region/Satellite Office	No. of Landing Sites	No. of Fisheries Officers	Average No. of Landing Sites per Officer
Mombasa	44	2	22
Kwale	50	3	17
Kilifi	67	2	34
Busia	25	2	13
Kisumu	304	20	15

Source: OAG analysis of interview minutes and the Marine Frame Survey, 2016

4.28 The available staff could only create awareness to a limited number of BMU's. Further, review of KeFS regional offices Authority to Incur Expenditure (AIE) for the financial years 2017/18 to 2021/22 indicated that there were no budget allocations for awareness creation. Consequently, the available staff could not carry out awareness creation during the period due to lack of resources. The required resources include transport to BMUs and training materials.

4.29 As a result, awareness creation was carried out through a collaborative effort between KeFS and its stakeholders. For instance, KeFS Coastal regional office participated in awareness creation during donor funded field visits through projects funded by the Kenya Coastal Development Project. The Kisumu regional office relied on trainings organized by the Lake Victoria Fisheries Organization, where BMU representatives and members were trained on proper fish handling practices. However, the scope of awareness creation activities carried out by KeFS was limited to those covered in the objectives of the donor funded projects.

#### **iv. Inadequate Infrastructure at the Landing Sites**

4.30 According to Section 9 (o) of the Fisheries Management and Development Act, 2016, KeFS is to undertake the development of appropriate fisheries infrastructure, that relates to its mandate under the Act and the Constitution of Kenya, 2010. A review

of KeFS budgets for the financial years 2017/18 to 2021/22 revealed that there was no allocation of funding for the development of landing sites.

4.31 However, a review of the Fish Inspection and Quality Assurance (FIQA) annual report, 2020, revealed that the then State Department of Fisheries, Aquaculture and the Blue Economy (SDFABE) was undertaking development activities in landing sites. This was attributed to contracts for the works being signed prior to the establishment of KeFS. The audit established that the projects were still incomplete as at July 2022, as shown in **Table 4**.

**Table 4: Status of Development Activities at Landing Sites**

S/N	Landing Site	Region	Nature of Works	Status
1.	Kibuyuni	Kwale	Construction of sea weed drying racks	Incomplete
2.	Kituo Cha Kati	Malindi	Construction of a fish market, cold store and ice plant	Incomplete
3.	Shella	Malindi	Construction of a fish market	Incomplete
4.	Ngomeni	Malindi	Construction of a fish market, cold storage and ice plant	Incomplete

Source: Physical verification by OAG audit team

4.32 According to the Lake Victoria Frame Survey report, 2020, and the Marine Frame Survey Report, 2016, a landing site should have in place the following; bandas, cold rooms, drying racks, smoking kilns, public fish store, jetty, pontoon, electricity, public toilet, potable water, all weather roads, net repair facilities, fish gear shop, craft repair facilities, engine repair facility, fenced handling area, fenced landing site and a BMU office. In addition, cold rooms are essential for fishermen to store surplus catch in order to prevent deterioration of its quality, thus, minimizing post-harvest losses.

4.33 Physical verification of the 18 sampled landing sites revealed that none had all the requisite infrastructure. The audit established that out of the sampled landing sites, 6 had no bandas, 17 had no drying racks nor smoking kilns nor public stores, 14 had no jetty, 3 had no electricity while 16 were on public land as shown in **Table 5**. A detailed analysis of the available infrastructure in each of the sampled BMUs is shown in [Appendix 7](#).

**Table 5: Summary of Infrastructure at the Sampled Landing Sites**

Infrastructure/Name of Region	Kisumu	Marine	Naivasha	Turkana	Total
Number of Sampled Landing Sites	6	9	2	1	18
<b>Type of Infrastructure</b>					
Bandas	5	6	1	0	12
Cold rooms	2	3	0	0	5
Cold rooms (Operational)	0	1	0	0	1
Drying racks	0	1	0	0	1
Smoking kilns	0	0	0	1	1
Public fish store	0	1	0	0	1
Jetty	1	3	0	0	4
Pontoon	0	0	0	0	0
Electricity	6	6	2	0	15
Public toilet	6	6	2	1	13
Potable water	1	2	1	0	4
All weather roads	5	8	1	0	14
Handling area fenced	0	2	0	0	2
Fenced landing site	2	3	1	0	6
Privately owned landing site land	1	0	1	0	2

*Source OAG analysis of data on physical verification of landing sites*

4.34 The audit established that the 6 landing sites that lacked bandas fishermen were processing their fish catch unhygienically. They lacked working surfaces, hence cleaned fish from basins, increasing the likelihood of contamination. Further, cold rooms are essential for storage of excess catch in order to prevent deterioration of fish quality, thereby minimizing post-harvest losses. However, **Table 5**, shows that 17 out of the 18 sampled landing sites did not have cold rooms.

4.35 Physical inspection of landing sites at Kalokol and Karagita in Turkana and Naivasha region, respectively, revealed that fishermen lacked bandas, cold rooms, drying racks and potable water to hygienically process fish. Consequently, there were increased instances of post-harvest losses. This was attributed to the rising water levels in the lake which had submerged the infrastructure at the landing sites.

4.36 Further, a review of the Lake Victoria Frame Survey Report, 2020, and the Marine Frame Survey Report, 2016, revealed landing sites in the two regions did not have the requisite infrastructure, as shown in **Table 6**. Moreover, no frame survey had been conducted for both regions as at the time of the audit.

**Table 6: Inadequate Infrastructure at the Landing Sites**

Name of Region	Kisumu	Mombasa	Busia	Kwale	Kilifi
Total Number of Landing Sites	42	44	25	50	67
<b>Facilities in Landing sites</b>					
Bandas	28	3	19	13	8
Cold rooms	1	2	3	11	4
Drying racks	8	2	1	3	7
Smoking kilns	1	-	2	2	1
Public fish store	3	4	8	10	6
Electricity	15	7	10	6	7
Public toilet	26	9	17	12	9
Portable water	5	2	4	8	13
All weather roads	21	18	11	29	27
Fenced handling area	1	-	3	-	-
Fenced landing site	38	2	21	4	2

Source: Lake Victoria Frame Survey Report (2020) and Marine Frame Survey Report (2016)

4.37 As a result of inadequate infrastructure at the landing sites, there is increased risk of contamination of fish, leading to its deterioration in quality and eventually resulting to post-harvest losses.

#### **v. Inadequate Inspection of Fishing Activities**

4.38 According Regulation 19 of the Fisheries (Safety of Fish, Fishery Products and Fish Feed) Regulations, 2007, inspections for official control of fish, fishery products and fish feed shall be carried out regularly and according to priorities determined by risk assessment carried out by the competent authority, when non-compliance is suspected and when required for the purpose of certification. Inspection shall cover all stages of production, culture, handling, manufacture, processing, packaging, storage, transport, distribution, retail and wholesale trade and the export and import of fish, fishery products and fish feed from and into Kenya.

4.39 The audit established that KeFS did not conduct regular inspections of fish handling at the landing sites, markets, fish processing establishment and fishing vessels. This was attributed to a shortage of gazetted inspectors to conduct inspections. Further, the available inspectors had not been trained nor gazetted to enable them conduct fish inspection on quality assurance. As at the time of the audit, KeFS had only twelve gazetted inspectors who were not sufficient to discharge its mandate in all

the landing sites, markets and processing establishments as shown in **Table 7**. Further, the available inspectors were not being facilitated to conduct inspections.

**Table 7: Number of Gazetted Inspectors Compared to Landing Sites**

Name of Region/Satellite Office	Number of Gazetted Inspectors	Number of Landing Sites
Nairobi	5	-
Mombasa	2	44
Kwale	2	50
Kilifi	0	67
Busia	1	25
Kisumu	2	304
<b>Total</b>	<b>12</b>	<b>490</b>

Source: OAG analysis of document on list of gazetted inspectors

4.40 In addition to the inadequate vehicles, motorbikes and fuel, the inspectors did not have the requisite specialized equipment to carry out inspections. These include cameras, video gadgets, calculators for establishing the quantity of fish catch, tablets to feed in information to the database, freezer equipment, special jackets to enable them access cold rooms and inspection kits, among others.

4.41 Lack of regular inspections at the landing sites, fish markets and vessels result in the likelihood of non-adherence to quality standards requirements. This contributes to increased post-harvest losses.

### C. Declining Fish Stocks in Inland and Shallow Marine Waters

4.42 According to Part 1 Section 5 (1) and 5 (2) (o) of the Fisheries Management and Development Act, 2016, in order to protect, manage, use and develop aquatic resources in a sustainable manner, there is need to prevent or eliminate over-fishing and excess capacity. In addition, levels of fishing efforts<sup>19</sup> need to be managed so that they do not exceed levels commensurate with sustainable use of fishery resources.

4.43 Further, Section 40 (1) (a-f) states that the Director-General may impose any of the following measures for the conservation and management of any fishery:

- i. Implementation of closed seasons;
- ii. restrict fishing in prohibited fishing areas;
- iii. Put limitations on the types of gear including mesh size;
- iv. The types and or number of fishing vessels;

<sup>19</sup> Fishing effort refers to a given combination of inputs into the fishing activity, such as the number of hours or days spent fishing and numbers of gear used i.e. kilometers of nets used.

- v. The amount, size and age of fish that may be caught, landed or traded; and
- vi. Regulate the landing of fish in fish landing stations.

4.44 The measures and controls that KeFS uses to assess and mitigate the declining fish stock in the inland and marine shallow waters include: conducting frame surveys to determine the fishing effort; conducting Catch Assessment Surveys (CAS) to determine the amount of fish stocks, protection of fish breeding areas to allow for regeneration of fish stock, restocking of fingerlings and promotion of cage fish farming to ensure adequate supply of fish.

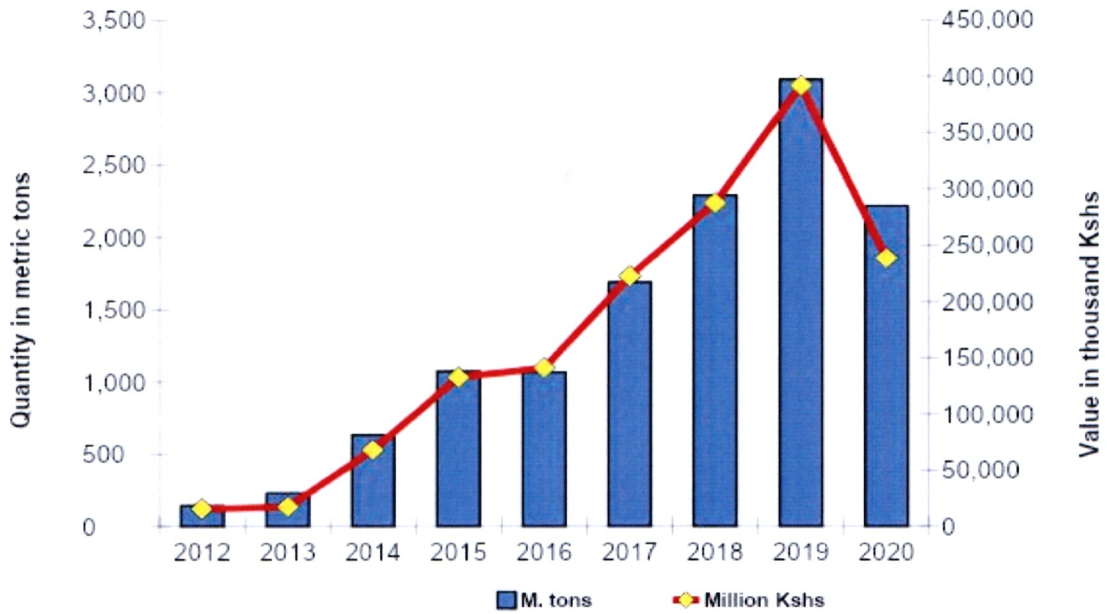
4.45 However, the audit revealed that not all the above measures were being observed in the regions. This contributed to a decline in fish stocks in inland waters and marine shallow waters as discussed below: -

#### i. Lake Naivasha

4.46 The fish population in the lake comprises of introduced species, the dominant species being Common carp (*Cyprinus carpio*), Nile Tilapia (*Oreochromis Niloticus*) and Catfish (*Clarias garenius*). In order to determine the recommended fishing effort, a maximum sustainable yield study is undertaken. As at the time of the audit, the recommended number of boats by KMFRI in the lake was 50. Interviews with KeFS officials at Central and South Rift regions revealed that there was excessive fishing effort in the lake. However, KeFS was yet to conduct frame surveys of the lake to establish the actual fishing effort.

4.47 Further, review of the KMFRI Technical Report, May 2022, revealed that there has been over exploitation of the fishery resource in the lake, resulting to a collapse that led to a one-year ban in the year 2001. To curb this decline, there has been regular restocking of fingerlings in the lake. This has resulted to an artificial annual increase in catch, rather than allowing for natural regeneration. The trend of annual fish catch in the lake for the period 2012 to 2020 is shown in **Figure 4**.

**Figure 4: The Trend of Annual Fish Catch in Lake Naivasha**



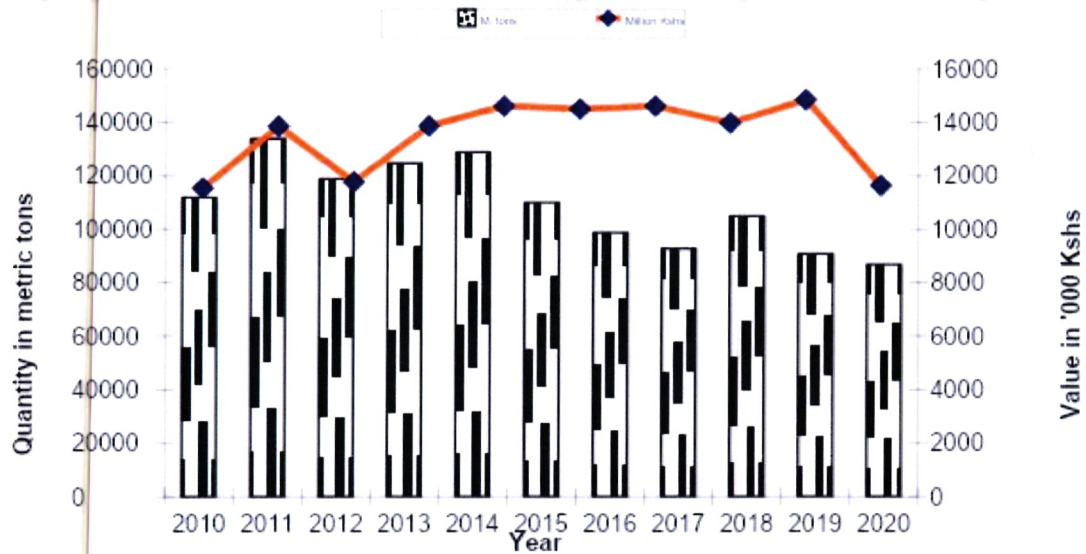
Source: Fisheries Annual Statistical Bulletin, 2020

4.48 Interviews with KeFS officials attributed the increase in the fishing effort to COVID 19, which rendered many people jobless, leading to an influx of fishermen in the lake.

## ii. Lake Victoria

4.49 Lake Victoria is a multi-species fishery with many known species. However, only Omena (*Rastrineobola argentea*) Nile Perch (*Late Niloticus*) and Nile Tilapia (*Oreochromis Niloticus*) are of major economic significance. A review of the Annual Fisheries Statistical Bulletin, 2020, by KeFS indicated that for the period 2010 to 2020 there was a decline of fish stocks in Lake Victoria as shown in **Figure 5**.

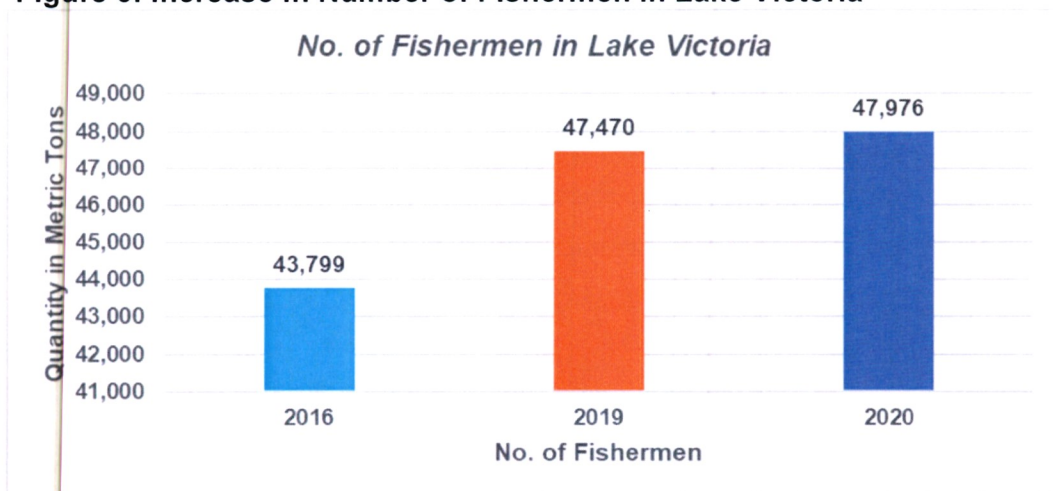
**Figure 5: Trends in Annual Fish Landings from Lake Victoria Fishery**



Source: *The Annual Fisheries Statistical Bulletin, 2020.*

4.50 Interviews with KeFS officials at the Kisumu regional office revealed that *Tilapia* and *Nile perch* species have been declining in number over time. The decline in fish stocks was attributed to overfishing due to an increase in the number of fishermen as shown in **Figure 6**. In order to mitigate on the declining fish stocks in the lake, KeFS was promoting cage fish farming at the time of the audit. This was aimed at increasing the supply of fish to meet the increasing demand.

**Figure 6: Increase in Number of Fishermen in Lake Victoria**



Source: *Lake Victoria Frame Survey Report, 2020*

4.51 The audit established that KeFS had not established the maximum sustainable yield<sup>20</sup> for the Lake to inform on the fishing effort. In addition, the decline in fish stocks was attributed to use of illegal monofilament nets which result to catching of immature fish. This is because the lines for monofilament nets are too small and difficult to spot when submerged in water. In addition, the nets are made of synthetic fiber that does not decompose. Therefore, if these nets are discarded, lost or abandoned in the lake, they continue to trap and entangle fish and potentially kill marine life.

### **iii. Marine Shallow Waters**

4.52 Marine fishing has the potential to increase Kenya's national fish production from 149,700 to 300,000 metric tonnes if fully exploited. However, the audit revealed that artisanal fishermen lacked the requisite skill set and appropriate equipment to exploit the fishery resource in the deep sea. Consequently, most of the fishing effort is concentrated in marine shallow waters, resulting to a decline in fish stocks in shallow waters. The audit established that other causes of declining stocks in marine shallow waters included climate change and use of illegal fishing methods.

4.53 A review of the Marine Frame Survey Report, 2016 established that there has been an increase in the fishing effort; the number of artisanal fishermen increased from 12,915 in 2014 to 13,426 in 2016. The last biannual frame survey for the Indian Ocean was conducted in 2016. As at the time of the audit, KeFS did not have any recent statistical information of the fishing effort in the Ocean.

4.54 The audit established that the main causes of overfishing in inland and marine shallow waters were as outlined below: -

### **iv. Fishermen Not Engaging in Alternative Sources of Livelihood**

4.55 According to the KeFS Strategic Plan, 2018 - 2022, one of the challenges Kenya faces in the fisheries and aquaculture sector is declining fish stocks. The decline in fish stock is attributed to an increase in the number fishermen due to lack of alternative sources of livelihood.

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<sup>20</sup> Maximum Sustainable Yield is the maximum fish catch (in numbers or mass) that can be removed from a population over an indefinite period.

4.56 An analysis of data collected from interviews held with BMUs indicated that out of the 18 BMU's sampled, only 6 had members who had alternative sources of livelihood, as shown in **Table 8**. Mkupe and Kibuyuni BMUs at the Coast region engaged in mangrove and seaweed farming, respectively. Marenga Omena, Marenga, Likoni and Central BMUs had a few of their members engaging in alternative sources of livelihood, which includes subsistence farming, Bodaboda operations, barber shop and rentals, among others. The remaining 12 BMUs mainly relied on fishing as the sole source of livelihood.

**Table 8: Summary of Data on Alternative Sources of Livelihood for the Fishermen**

Name of Region	Name of Landing Site	Alternative Sources of Livelihood
Kisumu	Rare	None
	Bao	None
	Kaloka	None
	Asat	None
Busia	Marenga Omena	Yes, but few
	Marenga	Yes, but few
Mombasa	Mkupe	Yes, mangrove farming
	Nyali	None
	Likoni	Yes, but few
Kwale	Gazi	None
	Kibuyuni	Yes, seaweed farming
	Shimoni	None
Malindi	Shela	None
	Ngomeni	None
	Kituo cha Kati	None
Naivasha	Karigita	None
	Central	Yes, but few
Turkana	Kalokol	None

*Source: OAG Analysis of data on alternative sources of livelihood*

4.57 A review of the Lake Victoria Frame Survey Report, 2020, established that in 2019 and 2020, the number of fishermen were at 47,470 and 47,976, respectively. Further, out of the total fishermen, those who engaged in alternative sources of livelihood were 627 and 267 in 2019 and 2020, respectively. Therefore, approximately 99% of fishermen were entirely dependent on fishing as the sole source of livelihood. This resulted in overfishing and consequently declining fish stocks.

#### **v. Kenya Fisheries Service has not Imposed Closed Seasons to Enhance Fish Breeding**

4.58 According to section 40 (1) (a) of the Fisheries Management and Development Act, 2016, the Director-General may impose closed seasons and or areas for species of fish or methods of fishing provided that customary fishing rights are protected. A

closed season is a specified period during which a category of fish may not be fished or harvested. Closed seasons hold great significance as they allow for breeding of fish, leading to an increase in stock in these waters. Interviews with KeFS officials and BMUs revealed that for all the 18 sampled BMU's there were no closed seasons implemented across the water bodies in the country. The audit established that closed seasons used to be imposed from 2003 up to 2012 for *Rastrineobola argentea* (Omena) in Lake Victoria. However, there has been no directive from the Director-General imposing closed seasons thereafter. Consequently, fishing activities continued throughout the year, with no time allowed for breeding, hence declining fish stocks.

#### **D. Continued Illegal, Unreported and Unregulated Fishing**

4.59 According Part 1 Section 2 of the Fisheries Management and Development Act, 2016, illegal fishing includes activities conducted by national or foreign vessels in waters under the jurisdiction of a state without its permission or in contravention of its laws and regulations. Unreported fishing includes activities which the relevant authority has not been notified while unregulated fishing includes activities conducted by vessels without nationality or by those flying the state flag not party to that organization or by a fishing entity in a manner that is not consistent with the conservation and management measures.

4.60 The audit established that there is continued Illegal, Unreported and Unregulated (IUU) fishing. IUU is a major contributor to overfishing, thus threatening food security, maritime livelihoods and fisheries sustainability. The increased IUU was attributed to: Inadequate monitoring, control and surveillance; failure to fully operationalize the Fisheries Management and Development Act, 2016; lack of regulations to establish and provide for the functions of the Inter-Agency Unit and inadequate inspection by the MCS unit.

##### **i. Inadequate Monitoring, Control and Surveillance by the Kenya Fisheries Service**

4.61 Section 20 (1) and (2) of the Fisheries Management and Development Act, 2016, outlines the functions of the Monitoring, Control and Surveillance Unit (MCS) as monitoring, control, surveillance, enforcement and compliance. Further, the Act require the MCS unit to perform monitoring, control and surveillance at bilateral, sub-

regional, regional and international levels to implement agreements or binding measures.

4.62 The audit established that KeFS was not conducting regular monitoring and surveillance of fishing activities due to the following reasons.

**a. Inadequate Resources**

4.63 The Kenya Fisheries Service requires resources such as patrol boats, funding and staff in order to effectively monitor and curb illegal, unreported and unregulated fishing activities. The audit revealed that they did not have boats to undertake patrols and surveillance. In addition, they had inadequate vehicles and motorbikes to facilitate their movement during MCS operations, especially in areas of vast coverage.

4.64 A review of KeFS organizational structure, grading and staff establishment for the marine and Coastal regional office indicated that there were 26 constable fisheries guards or corporal inspectors, against the establishment of 45. Further, a review of the Authority to Incur Expenditure (AIE's) for the financial years 2017/18 to 2021/22 established that none of the sampled regional offices had received funding for MCS activities, despite being included in the workplans and budgets.

4.65 As a result of inadequate resources to conduct monitoring, control and surveillance, KeFS relies on facilitation by stakeholders to carry out MCS activities. The stakeholders include; Kenya Coast Guard Service (KCGS), Kenya Wildlife Service (KWS), National Police Service (NPS) and Judiciary Service Commission (JSC), among others as shown in [Appendix 8](#). The reliance on the stakeholders to conduct MCS resulted in inadequate patrols.

**b. The Vessel Monitoring System at the Coast Regional Office has not been Fully Operationalized**

4.66 According Section 157 (1) of the Fisheries Management and Development Act, 2016, the Director-General may establish and operate a Vessel Monitoring Systems (VMS) for purposes of monitoring, control and surveillance and managing the operations of fishing vessels. In order to effectively monitor operations of fishing vessels, the then State Department of Fisheries, Aquaculture and the Blue Economy procured a monitoring system in the year 2017, under the Kenya Coastal

Development Project (KCDP). The operation of the Vessel Monitoring System was handed over to KeFS in July 2021. The system is used to collect data on operations of vessels in the ocean, including fishing routes and patterns.

4.67 The monitoring system runs on a platform known as Themis which has four modules; Vessel Monitoring System (VMS), Automatic Identification System (AIS), Satellite Radar Imagery (SRI) and Oceanographic. The modules complement each other and can enhance effective monitoring, control and surveillance when operated together. The audit established that all the four modules had been installed at the Coast regional office. However, only the VMS module had been operationalized. As at the time of the audit, payment for the subscription fees for the VMS module was not up to date. Therefore, the VMS module was operating under the good will of the service provider and was at the risk of being disconnected. Due to failure to operationalize the other modules, KeFS is unable to: monitor the real time movement of vessels; take aerial pictures to identify dark vessels and track areas with high fish density that need close monitoring.

4.68 In addition, there was only one trained and qualified staff who was working 8 hours a day to operate the monitoring system, despite the fact that ocean operations require to be monitored on a 24-hour basis, as fishing happens during the day and night. As a result, KeFS could not carry out adequate monitoring, control and surveillance of Kenya's territorial waters, contributing to illegal, unreported and unregulated fishing.

#### ii. Fisheries Management and Development Act, 2016 has been Partially Operationalized

4.69 According to Section 208 (1) of the Fisheries Management and Development Act, 2016, the Cabinet Secretary responsible for fisheries may make regulations for the better carrying into effect of the provisions of the Act. A review of the Act revealed that the Cabinet Secretary was to develop four regulations to operationalize it in relation to MCS as listed below.

- **Section 37(1) on establishment of BMUs-** to ensure structured community participation in fisheries management and make regulations setting out standards for the management of BMUs established by county governments;

- **Section 42 (1) (m) on the prohibited fishing gear and methods-** to ensure use of right gear and methods for sustainable fishing;
- **Section 47 (2) on marine protected areas-** to ensure proper governance and management of protected areas; and
- **Section 55 (1) for the export of live fish-** to ensure the international trade in specimen of wild animals and plants does not threaten their survival.<sup>21</sup>

4.70 The audit established that except for the regulation on the export of live fish, the rest had been drafted but had not been enacted. Consequently, KeFS was using regulations of the repealed Fisheries Act cap 378, 2012 to implement provisions of the FMD Act, 2016. The provisions of the old Act may be inconsistent with the new Act, leading to continued illegal, unreported and unregulated fishing.

4.71 According to Part V Section 37 (1) of the FMD Act, 2016, BMU's are established by county governments and are key stakeholders in the co-management of fisheries in relation to monitoring, control and surveillance. Upon promulgation of the Constitution of Kenya, 2010, fisheries activities were devolved to county governments, while fishing remained a function of the National Government. In the absence of BMU regulations to operationalize the Act, the roles of BMUs have not been clearly defined. For instance, fish catch data collected at landing sites was being submitted to county governments instead of KeFS. Therefore, KeFS did not have data of the daily fish catch from BMUs for the financial years 2017/2018 to 2021/2022. Consequently, MCS activities are being negatively impacted for the lack of this data.

4.72 The failure to develop the regulations on marine protected areas has resulted in KeFS suspending the licensing of vessels.

### **iii. Lack of Regulations to Establish the Functions of the Inter - Agency Unit on Monitoring, Control and Surveillance**

4.73 According to Section 21(1) of the FMD Act, 2016, the Cabinet Secretary may make regulations establishing and assigning functions to an Inter-Agency Monitoring Control and Surveillance Unit. Section 21(3) outlines the principal function of this unit

<sup>21</sup> <https://cites.org/eng/disc/what.php> the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

as ensuring coordinated and effective inter - agency enforcement and compliance with the Act.

4.74 Combating Illegal, Unreported and Unregulated fishing requires collaboration among all the stakeholders involved in the management, conservation and development of fishery resources. Some of the stakeholders include; Kenya Coast Guard Service, Kenya Wildlife Service, Kenya Maritime Authority, National Environment Management Authority, National Police Service and KMFRI, among others as shown in [Appendix 8](#).

4.75 The Inter - Agency Unit provides a platform for various stakeholders to collaborate and effectively combat IUU. However, the audit established that this unit had not been constituted nor regulations establishing and assigning functions to this unit put in place as at the time of the audit. Failure to establish the Inter-Agency Unit has led to lack of a platform for the stakeholders to work together towards combating IUU. As a result, this has contributed to continued illegal, unreported and unregulated fishing.

#### **iv. Inadequate Inspection by the Monitoring, Control and Surveillance Unit**

4.76 The audit established that there was inadequate and irregular inspections on licensing of fishing vessels, fishermen, use of illegal gear and data collection by BMUs as detailed below; -

##### **a. Inadequate Inspection on the Licensing of Fishing Vessels, Fishermen and Use of Illegal Gear**

4.77 According to Section 84 (1) (a), (b) and (c) of the FMD Act, 2016, a valid and applicable license issued in accordance with Section 92(3) of the Act shall be required for using an industrial and semi-industrial fishing vessel, for fishing or fishing related activities in the Kenya fishery waters and using an artisanal fishing vessel for commercial purposes. Interviews with KeFS staff at the sampled regional offices indicated that there were no regular inspections being carried out on the licensing of fishing vessels, fishermen and use of illegal gear.

4.78 Further, the audit established that there were no inspections being carried out in Lake Naivasha and Lake Turkana regions. This was due to lack of facilitation and

inadequate staff to inspect all the BMUs. Physical inspection and document review revealed that there were still unlicensed fishermen, vessels, use of illegal gear and fishing methods. In this regard, regular inspections by KeFS would aid in minimizing the illegalities and curbing the illegal, unreported and unregulated fishing. **Table 9** shows the number of unlicensed fishermen and vessels in inland and marine waters.

**Table 9: Number of Licensed and Unlicensed Fishermen and Vessels**

S/N	Name of Landing Site	Number of Fishermen as per BMU Records	Licensed Fishermen as per KeFS Records	Unlicensed Fishermen	Number of Vessels as per BMU Records	Licensed Vessels as per KeFS Records	Unlicensed Vessels
<b>Kisumu</b>							
1	Rare	120	-	120	15	-	15
2	Bao	230	-	230	38	-	38
3	Kaloka	1,500	46	1,454	150	-	150
4	Asat	480	1	479	68	1	67
<b>Sub Total</b>		<b>2,330</b>	<b>47</b>	<b>2,283</b>	<b>271</b>	<b>1</b>	<b>270</b>
<b>Mombasa</b>							
5	Mkupe	219	211	8	Over 100	-	-
6	Nyali	140	81	59	9	-	-
7	Likoni	434	-	434	17	-	-
<b>Sub Total</b>		<b>793</b>	<b>292</b>	<b>501</b>	<b>26</b>	<b>-</b>	<b>-</b>
<b>Kwale</b>							
8	Gazi	200	47	153	49	-	-
9	Kibuyuni	412	52	360	8	-	-
10	Shimoni	350	125	225	100	-	-
<b>Sub Total</b>		<b>962</b>	<b>224</b>	<b>738</b>	<b>157</b>	<b>-</b>	<b>-</b>
<b>Malindi</b>							
11	Shella	650	711	-	150	-	-
12	Ngomeni	1,000	261	739	101	-	-
13	Kituo cha Kati	394	143	251	28	-	-
<b>Sub Total</b>		<b>2,044</b>	<b>1,115</b>	<b>990</b>	<b>279</b>	<b>-</b>	<b>-</b>
<b>Grand Total</b>		<b>6,129</b>	<b>1,678</b>	<b>4,512</b>	<b>733</b>	<b>1</b>	<b>270</b>

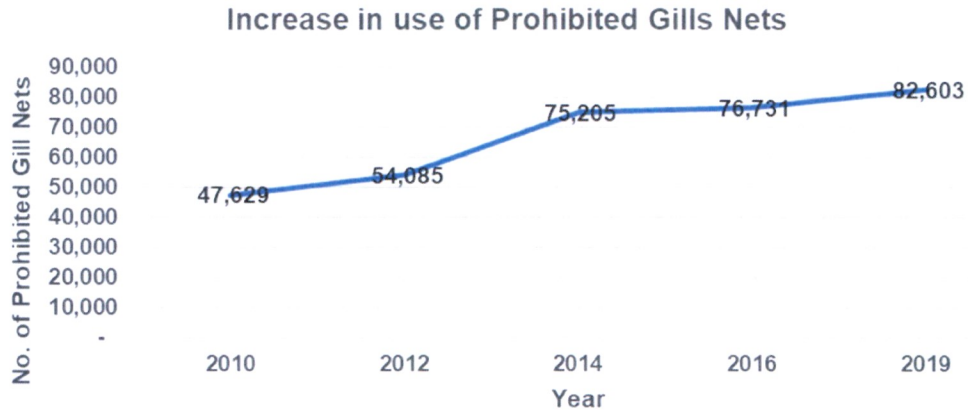
*Shella Landing Site- Some fishermen were not members of Shella BMU*

*Source: OAG analysis of data on licensed and unlicensed fishermen and vessels*

4.79 In addition, a review of the Lake Victoria Frame Survey Report, 2020, revealed that there was a rise in use of prohibited gill nets from 47,729 in 2010 to 82,603 in 2019 as shown in **Figure 7**. The nets are indiscriminate and result in high volumes of

bycatch<sup>22</sup>. They entangle much larger, non-target species of marine life up to and including whales.

**Figure 7: Increase in the use of Prohibited Gill Nets**



Source: Lake Victoria Frame Survey Report, 2020

#### **b. Unreported Data due to Irregular Data Collection**

4.80 According to Part III Section 9 (h) of the Fisheries Management and Development (FMD) Act, 2016, one of the functions of KeFS is to collect and analyze data in relation to resources and activities falling within the scope of the Act. Data collection on species, weight and size of the fish catch is important as it informs policy formulation by stakeholders and government agencies such as KMFRI.

4.81 Data collection is a collaborative effort between KeFS and Beach Management Units as outlined in the FMD Act (2016). Interviews with KeFS officials indicated that data on fish catch was not being collected on a regular basis across all the regional offices for the financial years 2017/18 to 2021/22. For instance, Lake Turkana region had irregular data collection due to lack of standard fish landing time as the timings were continuous and varied. In addition, KeFS staff experienced resistance from fishermen in this region and data collection efforts were interfered with, leading to use of estimates rather than the actual figures of fish catch.

4.82 The audit established that the irregular data collection in all the sampled regions was attributed to lack of resources such as office equipment, data collection tools,

<sup>22</sup> Unwanted fish and other marine creatures trapped by commercial fishing nets during fishing for a different species.

motorbikes, vehicles, fuel and adequate staff to monitor the data collection process. As at the time of the audit, KeFS and Beach Management Unit officers had not undergone training on data collection and use of data collection tools. Consequently, KeFS did not have the current status of data to aid in decision making, especially on key policy issues regarding IUU fishing.

#### **E. Other Findings – Quality Control Laboratories were Not Operational**

4.83 According to section 30 (n) of the Fish Management and Development Act, 2016, the Director-General may, in consultation with county governments, appropriate agencies and other departments of government, promote the development of activities within the scope of the Act, through providing for the establishment of accredited fish safety and quality control laboratories and other infrastructural facilities.

4.84 As at the time of the audit, KeFS had three laboratories located in Nairobi, Mombasa and Kisumu. The laboratories were funded through a grant from the Spanish Government. The contract for supply and installation of equipment for the three laboratories was signed on 23 October, 2013 for a contract period of 18 months at a contract sum of 5,740,824 Euros, equivalent to Kshs.656,780,692 at the then exchange rate. Interviews, document review and physical verification at the three laboratories revealed that despite the investment in constructing and equipping the laboratories, they had not been operationalized, nine years later. Consequently, value for money is yet to be realized on the investments in the three laboratories. Further, the audit established that the then State Department of Fisheries, Aquaculture and the Blue Economy was yet to handover the three laboratories to KeFS.

4.85 Failure to operationalize the laboratories was due to the reasons detailed below, among others.

##### **i. Incomplete Installation of Equipment and Expired Software Licenses**

4.86 Document review of the installation status report dated 05 October, 2021 revealed that in Nairobi and Mombasa region, software licenses of laboratory equipment; Filling unit/UV Lamp PS20/900 and the PetriSwiss (Stacking Unit) had expired,

rendering the equipment non-functional. The UV lamp is used to decontaminate interior surfaces of biological safety cabinets while the stacking unit is used for dish feeding discharging and stacking. Further, the process of installing the required equipment was incomplete, as shown in **Table 10**.

**Table 10: Status of Installation of Laboratory Equipment**

No.	Name of Equipment	Status	Remarks
<b>Nairobi Laboratory</b>			
1.	Drying Laboratory Oven	Installed	Not tested
2.	AA Spectrophotometer	Uninstalled	Missing part
3.	Freezer Dryer	Uninstalled	Failed to initialize indicated ether card error
4.	Soxhlet Extraction System	Uninstalled	Missing parts
5.	Filling unit/UV Lamp for PS20/900	Uninstalled	Expired license
6.	Media Preparation System Complete Version	Uninstalled	There was leakage in the pipes
<b>Mombasa Laboratory</b>			
1.	Freezer Dryer (TELSTAR)	Installed	Staff require training on how to operate it
2.	Filling unit/UV Lamp for PS20/900. 8422.9030	Uninstalled	Expired software license No staff training done
3.	Two 37-degree C Incubators (SELECTA)	Only one incubator was partially installed	Thermostat faulty No training
4.	PetriSwiss (Stacking Unit)	Not fully installed	Expired installation software
5.	Some incubators	Not fully installed	Faulty thermostats
6.	GC system	Not working	Cable fault/software issues
7.	Band Saw	Not working	No power supply
8.	CO <sub>2</sub> Incubator	Not working	Lacking CO <sub>2</sub> supply
9.	Incinerator (electrical)	Not working	No power supply
10.	Laboratory mill	Not working	No power supply
11.	Meat grinder	Not working	No power supply
<b>Kisumu Laboratory</b>			
1.	Freezer Dryer (LYOBETA 3Ps)	Uninstalled	Settings failure and required a compressor to separate the trays
2.	Cool Water Circulator CD200F (Julabo)	Uninstalled	Equipment was not working well, it was displaying an error message
3.	Meat Chopper PS12	Uninstalled	The motor was grounded
4.	Media Preparation System (MPS) SOTAX	Uninstalled	Needs to be connected to water supply
5.	Distiller OA 005/006, DESA00810	Uninstalled	Requires an industrial socket

Source: Laboratory Equipment Installation Status Report

## **ii. Staff Not Adequately Trained Usage of the Equipment in the Laboratories**

4.87 In the financial year 2020/2021, the then State Department of Fisheries, Aquaculture and the Blue Economy recruited competent staff to collect and analyse samples in the three laboratories. Thereafter, the staff were deployed to the three laboratories by KeFS. However, as at the time of the audit, staff deployed in the laboratories were yet to make practical use of their skills, since they had not undergone comprehensive training on the use of the installed equipment. Further, the user interface for some of the equipment was in Spanish language, hence, staff could not operate the equipment as they were not proficient in Spanish.

## **iii. Laboratories did not have adequate Reagents and Consumables**

4.88 Physical verification in the three laboratories revealed that they lacked adequate reagents and consumables to carry out tests to determine the safety and quality of fish and fish products. Interviews and document review revealed that laboratory staff had requisitioned for the requisite reagents and consumables but they had not been procured due to lack of funds.

## **iv. Laboratories Experienced Insufficient Power and Water Supply**

4.89 For proper functioning of a laboratory, there is need for sufficient power supply, water supply and a back-up generator. Interviews with staff in the three laboratories revealed that they were experiencing water shortage and electricity outages. Further, power supply at the Nairobi laboratory was 2- phase electric power while the equipment required a 3-phase power supply to run. In addition, the Nairobi laboratory had sewerage and water supply challenges that required rectification before the laboratory being operationalized.

4.90 In Kisumu regional office, the laboratory did not have a functional power back-up generator to supplement power during blackouts. As a result, the equipment is likely to be affected by the power black outs.

## **v. Laboratories Not ISO Certified**

4.91 ISO Certification (ISO/IEC 17025) enables laboratories to demonstrate that they operate competently and generate credible results, thereby promoting confidence in their work both nationally and internationally. The certification facilitates cooperation

with other laboratories and relevant agencies by generating results that are accepted internationally, thereby improving international trade.

4.92 The three laboratories were not ISO Certified as at the time of the audit. Therefore, the results of analysis undertaken in the laboratories could not be accepted nationally and internationally. Consequently, analysis of the samples was being outsourced to accredited laboratories. Most of the accredited laboratories were privately owned and expensive, as compared to the fees that could have been charged if the three government laboratories were operational.

## 5.0 CONCLUSION

- 5.1 The Country's fishing sector has the potential to double its contribution to the GDP from the current contribution of 0.6% in 2021 to 1.2%. However, the fishing sector is faced with challenges that have led to an inadequate supply of fish in the Country.
- 5.2 Kenya's deep-sea fishing is underexploited despite it being one of the strategies for increasing fish production in the Country. The under exploitation is a result of majority of fishermen lacking the requisite skills and equipment to undertake deep sea fishing. Despite the Government investment in training fishermen in the Coast region on deep sea fishing, the skills remain inadequate due to the low numbers trained and failure to undertake deep sea fishing post training. Further, the Country does not have an adequate number of deep-sea fishing vessels, owing to the high initial capital outlay required to acquire the vessels. Consequently, most of the vessels operating in Kenya are not locally owned.
- 5.3 The fishing industry in Kenya is experiencing huge post-harvest losses leading to wastage of food, thereby affecting food security in the Country. Post-harvest losses were as a result of landing sites lacking the requisite infrastructure and equipment for proper fish handling. KeFS inspections of landing sites has also been inadequate. In addition, there has been minimal awareness on proper fish handling methods, thereby contributing to post-harvest losses.
- 5.4 Fish stocks in both inland waters and marine shallow waters have been declining over the years. This has been due to overexploitation of the fishery resource as the fishing effort has increased. The increase in the fishing effort is attributed to fishermen not engaging in alternative sources of livelihood. The Kenya Fisheries Service has also not instilled measures to mitigate the declining fish stock. For instance, since 2012, there have been no closed seasons to allow for natural breeding of fish.
- 5.5 There is inadequate monitoring and control by the Kenya Fisheries Service which has resulted in an increase of Illegal, Unreported and Unregulated (IUU) fishing activities. The increase in IUU is attributed to use of illegal gears and unreported catch at the landing sites. Such activities pose a threat to biodiversity, livelihood and food security which may lead to the collapse of fishery resources or impair efforts to rebuild stocks that have already been depleted. Further, the Government's investment in a Vessel

Monitoring System to detect and deter IUU has not borne fruit as the system is yet to be fully operationalized.

## 6.0 RECOMMENDATIONS

- 6.1 In view of the findings and conclusions of this audit, the Auditor- General makes the following recommendations for implementation by the Kenya Fisheries Service and relevant key stakeholders in the fishing sector. The recommendations are aimed at improving the management of fishing activities and ultimately increasing the contribution of the fishing sector to the Country's GDP.
- 6.2 To ensure that the Country has the capacity to undertake deep sea fishing:
- i. The State Department for the Blue Economy and Fisheries should develop a framework to enhance the Country's exploitation of deep-sea fishing. The framework should target assisting investors and those interested to venture in deep sea fishing to acquire semi – industrial and industrial vessels. This could be by way of lobbying The National Treasury to provide tax incentives to investors to promote investment in deep sea fishing;
  - ii. The Kenya Fisheries Service should ensure that the Kenya Fishing School has adequate capacity to train fishermen on deep sea fishing. This will ensure that more fishermen are trained on deep sea fishing; and
  - iii. The Kenya Fisheries Service should develop a framework to ensure the absorption of fishermen who have completed deep sea fishing training aboard commercial vessels.
- 6.3 To reduce post-harvest losses:
- i. The Kenya Fisheries Service should facilitate staff to carry out awareness creation activities on best practices in fish handling. The Kenya Fisheries Service should also undertake regular inspections of fishing vessels to ensure compliance with hygiene and sanitary requirements in all landing sites and fishing vessels. This would lead to improved fish quality and reduce post-harvest losses;
  - ii. The Kenya Fisheries Service should ensure that landing sites have the requisite infrastructure and equipment;

- iii. The Kenya Fisheries Service should enforce the compliance with regulations and standards in line with the Fisheries Management and Development Act, 2016; and
- iv. The Kenya Fisheries, in collaboration with stakeholders, should promote value addition in the sea food value chain in order to minimize post-harvest losses.

6.4 To mitigate declining fish stocks:

- i. The Kenya Fisheries Service in collaboration with the Kenya Marine and Fisheries Research Institute should establish the maximum sustainable yield in inland and marine shallow waters in order to regulate the fishing efforts. Further, the Kenya Fisheries Service should enhance monitoring, control and surveillance on the type of gear, mesh size, the types and or number of fishing vessels, the amount, size and age of fish that may be caught, landed or traded and regulate the landing of fish in fish landing sites;
- ii. The Kenya Fisheries Service should implement closed seasons across all high commercial value species. This will allow fish stocks time to regenerate naturally. Further, the Kenya Fisheries Service should ensure that no fishermen fish in prohibited fishing areas, such as breeding areas; and
- iii. The Kenya Fisheries Service, in collaboration with relevant stakeholders, should develop mechanisms of encouraging Beach Management Units to engage in alternative sources of livelihood.

6.5 To deter Illegal, Unreported and Unregulated fishing:

- i. The Kenya Fisheries Service should collaborate with the Kenya Coast Guard Service for continuous monitoring and surveillance of the territorial waters;
- ii. The Kenya Fisheries Service should make timely payment of subscription fees for the Vessel Monitoring System. Further, the Kenya Fisheries Service should consider operationalization of all the modules of the monitoring system. This will enhance monitoring and surveillance of fishing activities in the ocean, in order to mitigate and deter Illegal, Unreported and Unregulated fishing. In addition, adequate staff should be trained and deployed to operate

the Vessel Monitoring System. This will ensure that fishing activities in the Indian Ocean are monitored on a 24-hour basis;

- iii. The Kenya Fisheries Service should ensure that staff have the requisite equipment to enhance monitoring, control and surveillance; and
- iv. The Kenya Fisheries Service should fast track the finalization of regulations on the Inter-Agency Monitoring Control and Surveillance Unit, establishment of Beach Management Units, the prohibited fishing gear, marine protected areas and the export of live fish. This will enable the full operationalization of the Fisheries Management and Development Act, 2016.

6.6 To promote national and international fishing trade:

- i. The State Department for the Blue Economy and Fisheries should ensure that the process of installation of equipment in the laboratories is completed and that the laboratories are operationalized. Further, they should ensure that the laboratories are ISO Certified. This will demonstrate that the laboratories operate competently and generate credible results, thereby promoting confidence in their work, both nationally and internationally.

## 7.0 APPENDICES

### Appendix 1: List of Documents Reviewed

Document Reviewed	Purpose of the Review
Manual of Standard Operating Procedures for Fish Inspection and Quality Assurance	To gain an understanding of the procedures undertaken by KeFS
Marine Frame Survey Report, 2016	To get an overview of the current stock of crafts, gears, fishermen and landing sites facilities and services
Lake Victoria Frame Survey Report, 2020	
Progress Reports on Fish Crew Training	To know the status of the ongoing training of 1000 fishermen by the Government
KEFS Strategic Plan, 2018 – 2020	To gain an understanding of KeFS programs, projects and activities geared towards achieving their objectives
KeFS Annual Work Plans, 2016 – 2021	To get an understanding of KeFS planned activities for each financial year
KeFS Organizational Structure, Grading and Staff Establishment, June 2020	To understand the structure of the organization and the different cadres of staff
Kenya Fisheries Customer Service Charter	To understand the services offered by KeFS and the requirements, costs and timelines
Catch Assessment Reports	To know the total fish, catch and the type of species caught
Fisheries Management and Development Act No.35 of 2016	To gain an understanding of KeFS mandate and functions
Fisheries Act Cap.378 and its regulations	To gain an understanding of the regulations that govern the fisheries sector
The Constitution of Kenya, 2010	To gain an understanding distribution of functions between the National Government and county governments
Research Reports by Kenya Marine and Fisheries Research Institute	To obtain information regarding catch, post-harvest losses and illegal, unreported and unregulated fishing
Authority to Incur Expenditure (AIEs)	To establish financial resources disbursed to the regional offices
Statistical Bulletin (2020)	To obtain data on fish catch
Data on licensed fishermen and vessels	To obtain statistics on licensed fishermen and vessels
Data on seized prohibited gears and arrests	To obtain the measures taken to curb illegal, unreported and unregulated fish

## Appendix 2: List of People Interviewed

No	Designation	Purpose of the Interview
1.	Acting Director Capture Fisheries	To understand the mandate of the directorate and personnel employed and catch assessment in the region
2.	Director Fish Quality Safety and Trade	To understand the mandate of the directorate and personnel employed, how inspections are conducted and measures in place to ensure fish quality is high
3.	Director Human Resource	To find out the organizational structure of KeFS, their staff establishment and their staff needs
4.	Regional Heads	To obtain overview of fisheries management in the region, challenges faced and successes achieved
5.	Regional directors of Capture Fisheries, FIQA and VMS Operator	To understand their mandate and how they ensure conservation, management and development of fisheries in Kenya.
6.	BMU Committee	To understand what a BMU is, the role of BMUs in fishing activities and any challenges they face
7.	BMU fishermen, traders, boat makers and net makers	To understand the current state of affairs on the ground, any challenges they face and recommendations
8.	Fish Processing Establishments owners	To know how imports and exports are done To understand how fish from fishermen reach the processing establishments To understand licensing requirements
9.	Kenya Marine and Fisheries Research Institute Staff	To obtain data on research undertaken in the fisheries sector
10.	Kenya Coast Guard Service Staff	To understand their role in combating illegal, unreported and unregulated fishing
11.	Bandari Maritime Academy Staff	To obtain an understanding of Standards of Training, Certification and Watch Keeping (STCW) course and the progress.

### Appendix 3: List of Sampled Beach Management Units

Name of Region	Name of Landing Site
Kisumu	Rare Beach Management Unit
	Bao Beach Management Unit
	Kaloka Beach Management Unit
	Asat Beach Management Unit
Busia	Marenga Omena Beach Management Unit
	Marenga Beach Management Unit
Mombasa	Mkupe Beach Management Unit
	Nyali Beach Management Unit
	Likoni Beach Management Unit
Kwale	Gazi Beach Management Unit
	Kibuyuni Beach Management Unit
	Shimoni Beach Management Unit
Malindi	Shella Beach Management Unit
	Ngomeni Beach Management Unit
	Kituo cha Kati Beach Management Unit
Naivasha	Karagita Beach Management Unit
	Central Beach Management Unit
Turkana	Kalokol Beach Management Unit

#### Appendix 4: Number of Fishermen Trained on Deep Sea Fishing

County	Phase I: Theory	Phase II: Shallow Fishing	Phase III: STCW	Phase IV: Deep-sea Fishing
Kilifi	100	100	100	99
Lamu	86	86	74	55
Tana River	73	-	73	37
Mombasa	97	-	93	88
Kwale	100	-	99	79
Taita Taveta	6	-	6	5
Busia	3	-	3	1
Homabay	2	-	2	1
Kajiado	1	-	1	1
Kiambu	2	-	2	2
Machakos	2	-	2	2
Nairobi	1	-	1	1
Nandi	1	-	1	1
<b>Total Trained</b>	<b>474</b>	<b>186</b>	<b>457</b>	<b>372</b>

Source: Progress report on fish crew training coordinated at KeFS Mombasa regional office as at 07 July, 2022

## Appendix 5: Sanitary Requirements at the Landing Sites

No.	Landing Site	Potable Water	Clean Working Surfaces	Clean Floors	Clean Display Counters	Clean Equipment	Weighing Scales
<b>Kisumu</b>							
1	Rare	X	X	X	x	X	X
2	Bao	X	X	X	x	X	X
3	Kaloka	✓	✓	X	x	X	✓
4	Asat	X	✓	✓	✓	X	X
<b>Busia</b>							
5	Marenga	X	X	X	x	X	X
6	Marenga	X	✓	✓	x	X	X
<b>Mombasa</b>							
7	Mkupe	X	X	X	x	X	X
8	Nyali	X	X	X	x	X	X
9	Likoni	X	X	X	x	X	✓
<b>Kwale</b>							
10	Gazi	✓	X	X	x	X	✓
11	Kibuyuni	X	X	X	x	X	✓
12	Shimoni	X	X	X	x	X	X
<b>Malindi</b>							
13	Shella	X	X	X	x	X	X
14	Ngomeni	✓	✓	✓	✓	X	X
15	Kituo cha Kati	X	✓	✓	✓	X	X
<b>Naivasha</b>							
16	Karagita	X	X	X	x	X	X
17	Central	✓	X	X	x	X	X
<b>Turkana</b>							
18	Kalokol	X	X	X	x	X	X

Source: OAG analysis of data on sanitary requirements on landing sites

Key: ✓ - In place      X - Not in place

## Appendix 6: Access to and Price of Ice Flakes

Number	Name of Landing Site	Region	Access to Ice Flakes	Price per kg (Kshs.)
1	Rare	Kisumu	No	N/A
2	Bao	Kisumu	No	N/A
3	Kaloka	Kisumu	No	N/A
4	Asat	Kisumu	No	N/A
5	Marenga Omena	Busia	Yes	13
6	Marenga	Busia	Yes	26
7	Mkupe	Mombasa	Yes	50
8	Nyali	Mombasa	No	N/A
9	Likoni	Mombasa	Yes	50
10	Gazi	Kwale	Yes	10
11	Kibuyuni	Kwale	No	N/A
12	Shimoni	Kwale	Yes	10
13	Shella	Malindi	Yes	7
14	Ngomeni	Malindi	No	N/A
15	Kituo cha Kati	Malindi	No	N/A
16	Karagita	Naivasha	No	N/A
17	Central	Naivasha	Yes	-
18	Kalokol	Turkana	No	N/A
Key: N/A – Unknown				

Source: OAG Analysis of data on access and price of ice Flakes

Appendix 7: Infrastructure at the Sampled Landing Sites

BMU ITEM	Lake Victoria Region						Marine Region										Lake Naivasha		Lake Turkana
	Marega	Marega Omena	Ba	Asat	Kaloka	Rare	Kito Chakati	Ngome	Shella	Nyali	Likoni	Mkupa	Shimoni	Kibuyuni	Gazi	Karigita	Central Island	Kalokol	
Number of landing sites	1	1	1	1	2	1	5	4	1	5	6	5	2	1	1	1	1	1	
Bandas	✓	X	✓	✓	✓	✓	✓	X	X	X	✓	✓	✓	✓	X	✓	✓	X	
Cold rooms	X	X	X	✓	✓	X	✓	X	X	X	X	✓	X	X	X	X	X	X	
Cold rooms (Operational)	X	X	X	X	X	X	X	✓	X	X	X	X	X	X	X	X	X	X	
Drying racks	X	X	X	X	X	X	X	X	X	X	X	X	X	X	✓	X	X	X	
Smoking kilns	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	✓	
Public fish store	X	X	X	X	X	X	X	X	X	X	X	✓	X	X	X	X	X	X	
Jetty	X	X	X	X	✓	X	X	X	✓	✓	X	✓	X	X	X	X	X	X	
Pontoon	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
Electricity	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Public toilet	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Potable water	X	X	✓	✓	X	X	✓	✓	X	X	X	X	X	✓	X	✓	✓	X	
All weather roads	✓	✓	✓	✓	✓	X	✓	✓	✓	✓	✓	✓	✓	✓	X	✓	✓	X	

BMU	Lake Victoria Region						Marine Region										Lake Naivasha		Lake Turkana
	Marenga	Marenga Omena	Baobab	Asat	Kaloka	Rare	Kituchakati	Ngome	Shella	Nyali	Likoni	Mkupa	Shimoni	Kibuyuni	Gazi	Karigita	Central Island	Kalokol	
ITEM																			
Handling area fenced	X	X	X	X	X	X	X	✓	✓	X	X	X	X	X	X	X	X	X	
Fenced landing site	✓	X	X	X	✓	X	X	✓	X	X	X	✓	✓	X	X	X	✓	X	
Privately owned landing site land	X	✓	X	X	X	X	X	X	X	X	X	X	X	X	X	✓	X	X	

Source: OAG analysis

Key: ✓ – In place and meets requirements X – In place but does not meet requirements N/A – Not in place

## Appendix 8: Composition of the Inter Agency Monitoring, Control & Surveillance Unit

Members	Designation	Status of Membership
Director-General (Fisheries)	Chair	Permanent
Representative of Police/Internal Security	Member	Permanent
Representative of Judiciary	Member	Permanent
Representative of County Government (County Director of Fisheries)	Member	Permanent
Representative of BMUs	Member	Permanent
Representative Of NEMA	Member	Permanent
Representative of Public Health and Sanitation	Member	Permanent
Representative of Defence	Member	Co-opted
Representative of Cooperatives	Member	Co-opted
Representative of Water	Member	Co-opted
Representative of Immigration	Member	Co-opted
Representative of Kenya Revenue Authority	Member	Co-opted
Representative of Kenya Wildlife Service	Member	Co-opted
Representative Kenya Maritime Authority	Member	Co-opted
Representative Kenya Ports Authority	Member	Co-opted
Representative of East Africa Community / Foreign Affairs	Member	Co-opted

## Appendix 9: The Kenya Fisheries Service Response to the Draft Audit Report

Section in the Report	KeFS Response	Auditor's Comments
<p><b>Response from the Directorate of Capture Fisheries</b></p> <p><b>Introduction</b></p> <p>The current per capita fish consumption in the country is 4kgs, whereas the Africa average is 10kgs and the global average is 20kgs.</p> <p><b>Paragraph 1.4</b></p>	<p>Kenya's per capita fish consumption is estimated at 4.5Kg/year/person. Add pollution and climate change among other factors affecting the fisheries sector.</p>	<p>The information is noted. However, no data has been provided to substantiate the figure of 4.5Kg/year/person. Therefore, the section remains as captured in the report. The report has been amended to incorporate climate change as a factor affecting the fisheries sector.</p>
<p><b>Motivation of the Audit</b></p> <p>Artisanal fishermen from the marine region have been complaining of a reduction in fish catch from 90 kg per day in previous years to 40kg in recent years.</p> <p><b>Paragraph 1.5, iv</b></p>	<p>Please cite the source of the figure 90kg/day and 40 Kg/day. If this was said by fishermen, please specify the water body (marine or inland, dams or aquaculture and the landing fish landing station). The figures remain arbitrary unless the author linked them with a source.</p>	<p>The information is not arbitrary. The audit team has the source for the information. Therefore, the section remains as captured in the report.</p>
<p>The Government has allocated Kshs. 11.4 billion to the fishing sector over the past 5 years.</p> <p><b>Paragraph 1.5, v</b></p>	<p>The Government has allocated Kshs. 11.4 billion to the fishing sector over the past 5 years. The fishing sector includes the State Department of Blue Economy &amp; Fisheries, Kenya Marine Fisheries and Research Institute, Kenya Marketing Authority, Fish Levy Trust and KeFS. Since this audit is on how KeFS is managing fishing activities, it implies that all the Kshs. 11.4 billion was allocated to KeFS and part of OAG's motivation to conduct audit.</p>	<p>The audit drew its motivation from the amount of funds allocated to the fisheries sector as a whole. Therefore, the report does not depict that the whole amount was allocated to KeFS. This was part of the motivation for our Office to conduct the audit. The section remains as captured in the report.</p>

Section in the Report	KeFS Response	Auditor's Comments
	Please recast this and indicate the exact amount allocated to KeFS from the time it was delinked from the State Department for Blue Economy and Fisheries.	
<p><b>Audit Scope</b></p> <p>The audit covered a period of five financial years, from 2017/2018 to 2021/2022.</p>	<p>Kenya Fisheries Service was delinked in 2020 while the audit report considered period 2018/19 to 2021/2022. If you are auditing performance of KeFS then you need to begin from 2020/2021 to 2021/2022.</p>	<p>KeFS succeeded the defunct State Department of Fisheries (SDF) that previously managed the fisheries sector. In addition, the current staff were seconded from SDF, hence there has been seamless management of fisheries activities. Further, the audit sought to find out management of fishing activities by the Government. Since SDF was managing the sector on behalf of the Government, the scope remains as reported.</p>
<p><b>Description of the Audit Area</b></p> <p>The purpose of the service is to conserve, manage and develop Kenya fisheries and aquaculture resources. KeFS is also guided by the Maritime Zones Act, Cap 371 of 1989.</p> <p><b>Paragraph 3.1</b></p>	<p>The Act of Parliament referred to as Cap 371 of 1989 revised 2012 is in correct. Please define the Act or write it in full.</p>	<p>The Office appreciates the suggested amendment has incorporated the change in the report.</p>
<p><b>Key Role Players in the Management of Fishing Activities</b></p> <p><b>Beach Management Units</b></p> <p>In collaboration with Kenya Marine and Fisheries Research Institute and KeFS</p>	<p>The BMUs do not on their own identify and demarcate prohibited fishing zones. However, KMFRI involve BMUs in identification and demarcation of fish critical habitats (spawning and nursery grounds).</p>	<p>The audit has taken note of the suggestion and the paragraph has been duly amended.</p>

Section in the Report	KeFS Response	Auditor's Comments
<p>BMU assist in identify fish breeding areas based on indigenous knowledge and demarcate prohibited fishing zones. <b>Paragraph 3.21.</b></p>		
<p><b>Description of Fishing Activities Training of Deep-Sea Fishing Crew</b>  Phase I: Five-day theoretical training on sustainable fisheries management conducted and facilitated by KeFS and the Kenya Marine and Fisheries Research Institute officers.  Phase II: A five-day shallow water fishing practical training facilitated by KeFS, the concerned County Government and KMFRI officers.  Phase IV: A 10-day practical course on deep-sea fishing. This is spearheaded by KMFRI.</p>	<p>Phase I. This is done by KeFS and KMFRI.  Phase II. This is done by KeFS, KMFRI and County Government concerned.  Phase IV. Is spearheaded by KMFRI.</p>	<p>The audit has taken note of the new information and the paragraph has been amended.</p>
<p>Measures to conserve and manage fisheries resources:  Imposing closed seasons: A period in the year when fishing is officially forbidden. <b>Paragraph 3.27</b></p>	<p>The definition of closed season in the context of fisheries is incorrect. Please remove part of the game the author has used.</p>	<p>The Office has taken note of the information and the paragraph has been amended.</p>
<p>The overall objective of frame surveys is to establish the fishing effort in terms of numbers of fishermen, number of fishing vessels and the type of fishing gear used. <b>Paragraph 3.29</b></p>	<p>The overall objective of a frame survey is to establish the fishing effort in terms of numbers of fishermen, number of fishing vessels and the type of fishing gear used. Information of the fish landing station infrastructure is one of the specific objectives of a frame survey. Please recast this paragraph.</p>	<p>The audit has taken note of the information provided and the paragraph has been duly amended.</p>

Section in the Report	KeFS Response	Auditor's Comments
<p><b>Findings</b> The current per capita fish consumption in the country is 4kgs, whereas the Africa average is 10kgs and the global average is 20kgs. <b>Paragraph 4.1</b></p>	<p>Change per capita fish consumption to 4.5kg/year/person.</p>	<p>The information is noted. However, no data has been provided to substantiate the figure of 4.5Kg/year/person. Therefore, the finding remains as reported.</p>
<p>The Kenya Fisheries Service has a fishing school that was established in 2009. Kenya Fishing School is an initiative of KeFS that was established in 2016. However, the school does not offer training on deep sea fishing.</p>	<p>The Kenya fishing School was not established in 2009. Kenya Fishing School is an initiative of KeFS that was established in 2016. What the author is referring to as Kenya Fishing School has a branch within Sagana Aquaculture Centre of Excellence. The Kenya Fishing School has a branch within Sagana Aquaculture Centre of Excellence. Kenya Fishing School has a branch in Sagana Aquaculture Centre of Excellence.</p>	<p>The audit has taken note of the information and the paragraph has been duly amended.</p>
<p><b>Inadequate Skills to Undertake Deep Sea Fishing</b> A progress report dated 07 July, 2022 on Fish Crew Training, indicated that only 372 fishermen had successfully completed all the four training phases since its inception in 2021. A status report for 03 November, 2022 indicates that KeFS has trained an additional number of fishermen; 524 for phase I, 460 for phase II, 506 phase III and 447 for phase IV. <b>Paragraph 4.6-4.7</b></p>	<p>Figure 2 depicts an inaccurate figure under phase II, whereby instead of 460 as indicated in paragraph 4.8, the figure shows 186. Please amend in the figure. We had trained 460 as at the time of the audit.</p>	<p>The figure represents the status as at when field visit for data collection was done. Paragraph 4.7 (4.8 in the draft report) is an acknowledgement of progress made post the field visit. Therefore, the finding remains as reported.</p>

Section in the Report	KeFS Response	Auditor's Comments
<p>Interviews with Beach Management Units officials and members revealed that they were required to nominate members to undertake deep sea fishing at the Bandari Maritime Authority. The list of nominees was then forwarded to KeFS who subsequently submit the names to the Bandari Maritime Academy for training.</p> <p><b>Paragraph 4.8</b></p>	<p>In 2021, an advert for training opportunities in deep sea fishing was put in the media with required qualifications.</p> <p>The youth sent their applications which were processed.</p> <p>Those who qualified were selected and first 1,000 candidates were identified.</p> <p>The ongoing training is drawing the trainees from the first 1,000 batch.</p> <p>BMU may sometimes be used to contact those who cannot be reached through the telephone contact they provided.</p>	<p>The Office acknowledges the new information. However, the evidence gathered by the audit team is consistent with the reported finding. The audit will seek to find out the progress of the training in the follow-up audit. Therefore, the finding remains as reported.</p>
<p>The underutilization of the training funds was attributed to KeFS not submitting to the Bandari Maritime Authority the list of fishermen to be trained. In addition, COVID-19 pandemic affected the training schedules. Part II <b>Paragraph 4.8</b></p>	<p>The underutilization of the training fund was attributed to;</p> <p>Delayed allocation of funds for implementing Phases I and II. Remember a trainee cannot jump phases I and II and go for STCW training at Bandari Maritime Academy.</p> <p>COVID-19 pandemic as well delayed training as well.</p> <p>The this is now being fast tracked.</p>	<p>No evidence was provided for delay in allocation of funds. Hence, this was not captured as a cause of underutilization of the fund.</p> <p>COVID-19 caused global disruption hence the cause was noted the finding amended.</p>
<p>Document review of the Marine Artisanal Fisheries Frame Survey Report, 2016, revealed that the total number of fishermen in the coast region was 13,426 in 2016. With only 372 fishermen trained on deep sea fishing by July 2022, there was a gap of 13,054 untrained fishermen who could not undertake deep sea fishing due to lack of skills.</p> <p><b>Paragraph 4.9</b></p>	<p>The training program targets 5,000 fishermen and not 13,246 as indicated in the report. It is not practical to train the 13, 426 as indicated in the report. It is not practical to train the 13,246 fishermen with a view of transferring all the effort exerted by the 13,246 fishermen into deep-sea. This analysis is incorrect.</p> <p>However, the author can compare the number of trained fishermen against the target of 5,000. Training is not done for the fishermen to be</p>	<p>The analysis is a comparative analysis of official record of fishermen.</p> <p>KeFS did not provide proof to substantiate the target was 5,000. Hence the finding remains as reported.</p>

Section in the Report	KeFS Response	Auditor's Comments																																													
<p><b>Lack of Appropriate Vessels and Equipment to Undertake Deep Sea Fishing</b></p> <p>Document review of KeFS list of licensed vessels for the year 2021 revealed that the Government does not own vessels that can undertake deep-sea fishing. Therefore, most of the commercial vessels undertaking deep-sea fishing in the marine waters are owned by foreign investors, with only two Kenyans having invested in deep sea fishing.</p> <p><b>Paragraph 4.14</b></p>	<p>employed on fishing vessels alone but to also equip them with skills for fishing. The skills they acquire in phase I and II are very much applicable in artisanal fishing activities.</p> <p>The role of the Government is not to engage in fishing but to create an enabling environment for investment in both artisanal and commercial fishing. All the 14 commercial fishing vessels currently operating in our waters are owned by Kenyans and are licensed. Applications for registration from two more fishing vessels have been processed. The vessels are listed below:</p> <table border="1" data-bbox="758 786 1436 1458"> <thead> <tr> <th>Category</th> <th>Name of Vessel</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>Long liners</td> <td>Shang JYI</td> <td></td> </tr> <tr> <td></td> <td>Seamer II</td> <td></td> </tr> <tr> <td></td> <td>Miss Jane</td> <td></td> </tr> <tr> <td></td> <td>Newfoundland Alert</td> <td></td> </tr> <tr> <td></td> <td>Ocean Eagle</td> <td></td> </tr> <tr> <td></td> <td>Ocean Sniper</td> <td></td> </tr> <tr> <td></td> <td>Sea Mfalme (Rahorrakty)</td> <td>Application ongoing</td> </tr> <tr> <td>Crabbers</td> <td>Diamond Ace1</td> <td></td> </tr> <tr> <td></td> <td>Akhnation</td> <td></td> </tr> <tr> <td>Trawlers</td> <td>Roberto</td> <td></td> </tr> <tr> <td></td> <td>Vega</td> <td></td> </tr> <tr> <td></td> <td>Alpha Challenger</td> <td></td> </tr> <tr> <td></td> <td>Jackpot</td> <td></td> </tr> <tr> <td></td> <td>Alpha Manyara</td> <td></td> </tr> </tbody> </table>	Category	Name of Vessel	Remarks	Long liners	Shang JYI			Seamer II			Miss Jane			Newfoundland Alert			Ocean Eagle			Ocean Sniper			Sea Mfalme (Rahorrakty)	Application ongoing	Crabbers	Diamond Ace1			Akhnation		Trawlers	Roberto			Vega			Alpha Challenger			Jackpot			Alpha Manyara		<p>As per records provided by KeFS regarding semi-industrial and industrial fishing vessels licenced during the fiscal year 2019/2020, all the licenses had expired as at the time of the audit. Further, no evidence has been provided to support the response. Therefore, the finding remains as reported.</p>
Category	Name of Vessel	Remarks																																													
Long liners	Shang JYI																																														
	Seamer II																																														
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	Alpha Challenger																																														
	Jackpot																																														
	Alpha Manyara																																														

Section in the Report	KeFS Response		Auditor's Comments
	Jonas		
	Vuna	Ongoing applications	
<p>Document review revealed that 6 long liners and prawn trawlers operate in Kenya but have expired licences. <b>Paragraph 4.15</b></p>	<p>The licenses of fishing vessels above are valid.</p>		<p>The Office acknowledges the information. However, no evidence was provided to qualify the statement. Therefore, the finding remains as reported.</p>
<p><b>Declining Fish Stocks in Inland and Shallow Marine Waters</b> The dominant species are Common carp (<i>Cyprinus carpio</i>), Nile Tilapia (<i>Oreochromis Niloticus</i>) and <i>Clarias garenius</i>. <b>Paragraph 4.46</b></p>	<p>The dominant species is not Nile Tilapia but Common carp.</p>		<p>The Office has taken note of the information and the paragraph has been duly amended.</p>
<p>Interviews with KeFS officials attributed the increase in the fishing effort to COVID 19, which rendered many people jobless, leading to an influx of fishermen in the lake. <b>Paragraph 4.48</b></p>	<p>The reasons for increase in number of fishermen in lake Naivasha are: Using fisherman's licensing as a source of revenue by the Nakuru County Government, thus licensing more than the 50 optimal number. County Government is using Licensing is a tool for controlling access to the fisherman's licensing as a resource. Besides, licensing of fishermen is a source of revenue, hence the national function. COVID-19 also rendered many people jobless from the riparian communities and many ended up in fishing activities.</p>		<p>The Office acknowledges the new information. However, no evidence was provided to substantiate that the Nakuru County Government is using the fisherman's licensing as a source of revenue, hence the new information has not been incorporated in the report. COVID-19 as a cause of influx into the lake is already documented in the report. Hence the finding remains as was reported.</p>

Section in the Report	KeFS Response	Auditor's Comments
<p>The Kenya Fisheries Service did not have recent statistical information of the fishing effort in the Ocean. Further, interviews held with BMU officials established that the Catch Per Unit Effort (CPUE) had reduced.</p> <p><b>Paragraph 4.53</b></p>	<p>It is not correct to say that KeFS did not have statistical information on fishing effort. The annual statistical bulletin KeFS provided contained statistics on number of fishermen and vessels, among other relevant parameters. What KeFS did not have at the time of audit was the frame survey report for 2020. The 2020 frame survey was halted at the eleventh hour due to COVID-19. However, KeFS conducted the 2022 frame survey in September 2022.</p>	<p>The statistical bulletin only contains the quantity landed in metric tonnes and not the number of fishermen and fishing vessels. Hence, the finding remains as reported.</p> <p>The audit takes note of disruption caused by COVID - 19.</p> <p>A copy of the 2022 frame survey report was not provided to substantiate the new information. Hence, the finding remains as was reported.</p>
<p><b>Fishermen were not Engaging in Alternative Sources of Livelihood</b></p> <p>An analysis of data collected from interviews held with BMUs indicated that out of 18 BMU's visited, only 6 had members who had alternative sources of livelihood.</p> <p><b>Paragraph 4.56</b></p>	<p>Each of the BMUs in Busia County is undertaking cage fish farming with financial assistance from the Busia County Government.</p>	<p>The Office appreciates the information provided. However, no evidence was provided to substantiate the new information. In addition, the finding was drawn from interviews with BMU officials and members. The finding remains as reported.</p>
<p><b>The Kenya Fisheries Service had not Imposed Closed Season to Enhance Fish Breeding</b></p> <p>The audit established that closed seasons used to be imposed in the early 2000's for <i>Rastrineobola argentea</i> (Omena) in Lake Victoria. However, there has been no directive from the</p>	<p>Closed Season for Omena was imposed in 2003 up to 2012. KMFRI conducted a survey on the stocks of Omena and the findings showed a significant improvement on Omena stocks. Based on this survey report, the ban was lifted. A closed fishing season cannot be implemented forever. A closed fishing season can be lifted once the fish stocks in question has replenished.</p>	<p>The Office has taken note of the information regarding when closed seasons were imposed, why and when the ban was lifted. However, the finding as reported is factual as no closed season has been imposed. Therefore, the finding remains as reported.</p>

Section in the Report	KeFS Response	Auditor's Comments
<p>Director-General imposing closed seasons.</p> <p><b>Paragraph 4.58</b></p>	<p>Kindly note that to impose a closed season for any fish species, there has to be: Scientific information fish breeding habit and trends. KMFRRI has to undertake stock assessment and advise KeFS and the Cabinet Secretary to issue legal notice.</p>	
<p><b>The Vessel Monitoring System at the Coast Regional Office has not been Fully Operationalized</b></p> <p>The monitoring system runs on a platform known as Themis which has four modules; Vessel Monitoring System (VMS), Automatic Identification System (AIS), Satellite Radar Imagery (SRI) and Oceanographic Module.</p> <p><b>Paragraph 4.67</b></p>	<p>A vessel Monitoring system consist of the four modules captured in the paragraph. It is not a Themis which four modules. Please take note and correct this.</p> <p>It is also very important to note that each module has annual subscription fees. Depending on availability of funds, the service provider can disable a module if the annual subscription fee for that module has not been paid.</p> <p>All the four modules were procured and intact but the service provider can switch off any module for failure to pay subscription fee and switch on the module once the subscription fee is paid.</p>	<p>Themis a platform that integrate multiple sources of marine data; radar, AIS, VMS, catch reports, oceanography, among others.</p> <p>We agree that the vendor can switch on or off any module based on payment of subscription fees. The finding has been amended to incorporate the new information.</p>
<p><b>The Fisheries Management and Development Act, 2016 has not been Fully Operationalized</b></p> <p>A review of the Fisheries Management and Development (FMD) Act, 2016 revealed that the Cabinet Secretary was to develop four regulations to operationalize the Act in relation to MCS.</p> <p><b>Paragraph 4.69</b></p>	<p>The regulations the author mentioned in this paragraph are not four but three. Section 37 is on BMUs and draft BMU regulations are awaiting publication. The rest of the sections have been addressed in draft Marine Fisheries (Access and Development) Regulations, 2022 and Draft Inland Fisheries Regulations, 2021. The two are also awaiting publication.</p>	<p>Paragraph 4.70 acknowledges that the regulations are in draft form. Hence the finding remains as was reported.</p>

Section in the Report	KeFS Response	Auditor's Comments
<p>Upon inauguration of the Constitution of Kenya, 2010, fisheries activities were devolved to county governments, while fishing remained a function of the National Government. In the absence of BMU regulations to operationalize the Act, the roles of BMUs are not clearly defined. For instance, fish catch data collected at landing sites was submitted to county governments instead of KeFS. Therefore, KeFS did not have records of the daily fish catch data from the BMUs for the financial year 2017/18 to 2021/22.</p> <p><b>Paragraph 4.71</b></p>	<p>BMU roles are defined in the BMU Regulations 2007, which are still in force until new ones are developed. Concerning data collections and submission, the BMUs collect raw data on fish landings and submit to KeFS. It is only aquaculture data which the county staff collect from farmers and submit to KeFS because aquaculture is devolved.</p>	<p>The response is not consistent with actual occurrence as the audit team couldn't obtain daily catch data for the audit scope (F/Y 2017/18-2021/2022). Hence the finding remains as observed.</p> <p>The BMU Regulation, 2007 is not in line with the current dispensation as they were established before creation of devolution, hence, do not take into consideration the role of county governments in the fishing sector.</p>
<p>The failure to develop the regulation on marine protected areas has resulted to KeFS suspending the licensing of vessels.</p> <p><b>Paragraph 4.72</b></p>	<p>The Kenya Fisheries Service has not suspended licensing of vessels. Marine environment is captured in the Draft Marine Fisheries (Access and Development) Regulations, 2022.</p>	<p>As per records provided by KeFS regarding semi-industrial and industrial fishing vessels licenced during the fiscal year 2019/2020, all the licenses had expired as at the time of the audit. Further, no evidence was provided to substantiate the response. Therefore, the finding remains as reported.</p>
<p><b>Inadequate Inspection on the Licensing of Fishing Vessels, Fishermen and use of Illegal Gear</b></p> <p><b>Table 9:</b> Number of licensed and unlicensed fishermen and vessels</p>	<p>Please take note that there is no beach in Kisumu called Rare. As for the rest of the landing sites, I had shared with the OAG team the correct record of licensed fishermen and fishing vessels but no changes were made. I will still share with the team.</p>	<p>Rare Beach is one of the beaches that were sampled by the audit team in Kisumu County. Further, the audit has evidence on the existence of the beach. The team physically</p>

Section in the Report	KeFS Response	Auditor's Comments
		<p>visited and interviewed the officials in the presence of KeFS staff. The assertions made are not true. Therefore, the finding remains as reported.</p>
<p><b>Conclusion</b> Despite the Government investing heavily to train fishermen in the Coast region on deep sea fishing, the country has a skill gap as the numbers trained are few and have not undertaken deep sea fishing. <b>Paragraph 5.2</b></p>	<p>The training is ongoing despite having been delayed due to COVID-19.</p>	<p>The audit has taken into consideration that the training is ongoing and has incorporated the recent statistics from the Summary Progress Report Fishermen Training as at 03 November, 2022.</p>
<p>All the fisheries do not have closed seasons; hence, natural breeding of fish is not enhanced. <b>Paragraph 5.4</b></p>	<p>A closed season is NOT the only fisheries management measure that can improve fish stock. Please take note of the comment I have given in paragraph 4.54. Lack of adequate funding for undertaking MCS is the main reason KeFS has never received funding for MCS since establishment and delinking from SDF.</p>	<p>The Office acknowledges that a closed season is NOT the only measure to improve fish stock. However, the audit noted that closed seasons have not been implemented and that is what the audit reported. The conclusion remains as captured in the report.</p>
<p><b>Recommendations</b> The Kenya Fisheries Service should ensure that staff have the required equipment to enhance their monitoring, control and surveillance. <b>Paragraph 6.5</b></p>	<p>Monitoring, Control and Surveillance (MCS) is not a function of the State Department for Blue economy and Fisheries. It is a function of KeFS. As such MCS funds being held by the SDF should be allocated to KeFS.</p>	<p>The audit takes note of the comment and the recommendation has been amended.</p>

<b>Section in the Report</b>	<b>KeFS Response</b>	<b>Auditor's Comments</b>
<p><b>Appendix 2</b> To understand the mandate of the directorate and personnel employed and catch assessment in the region.</p>	<p>It is not a function of the Directorate of Capture to curb post-harvest. This is a function of the Directorate of Fish Safety, Quality and Trade. So please correct the reason for interviewing the Ag. Director Capture Fisheries.</p>	<p>The audit takes note of the correction and the section has been amended.</p>
<p><b>Response from the Directorate of Fish Safety, Quality and Trade</b> The FIQA Annual Report, 2020 indicated that development activities on landing sites were still ongoing at the end of 2020. Paragraph 4.31</p>	<p>However, a review of the Fish Inspection and Quality Assurance (FIQA) Annual Report, 2020, revealed that the State Department of Fisheries, Aquaculture and the Blue Economy (SDFABE) was undertaking development activities in landing sites. This is attributed to the contracts for the works being signed prior to the establishment of the Kenya Fisheries Service. The FIQA Annual Report, 2020 indicated that development activities on landing sites were still ongoing at the end of 2020. I did not see this FIQA report they are quoting during the audit. If it possible they can elaborate more on the same.</p>	<p>The Office referred to the Fish Inspection and Quality Assurance (FIQA) Annual Report, 2020 and has shared the report with the Director FIQA. The finding remains as reported.</p>
<p><b>Recommendations</b> The Kenya Fisheries Service should ensure that landing sites have the required infrastructure.</p>	<p>I have gone through the report and I have the observations below” According to Section 9 (o) of the Fisheries Management and Development Act, 2016, KeFS is to undertake the development of appropriate fisheries infrastructure, that relates to its mandate under the Act and the Constitution of Kenya, 2010. A review of KeFS budgets for the financial years 2017/18 to</p>	<p>The audit takes note of the suggestion and the recommendation has been amended.</p>

Section in the Report	KeFS Response	Auditor's Comments
	<p>2021/22 revealed that there was no allocation of funds for development of landing sites. The recommendations should change to read KeFS not State department from above observation.</p> <p>The State department of Fisheries, Aquaculture and the Blue Economy should ensure that landing sites have required infrastructure.</p>	
<p>The Kenya Fisheries Service should facilitate staff to carry out enforcement for compliance with regulations and standards.</p>	<p>I suggest they include a recommendation on post-harvest losses. That there is need for KeFS to facilitate staff to carry out enforcement for compliance with regulations and standards.</p>	<p>The recommendation has been fully included.</p>

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