

# THE UNITED REPUBLIC OF TANZANIA NATIONAL AUDIT OFFICE



# PERFORMANCE AUDIT REPORT ON THE MANAGEMENT OF INVASIVE ALIEN SPECIES IN TERRESTRIAL ENVIRONMENT





#### **About National Audit Office**

The statutory mandate and responsibilities of the Controller and Auditor General are provided for under Article 143 of the Constitution of the United Republic of Tanzania, 1977 and in Section 10 (1) of the Public Audit Act, Cap. 418.



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#### **PREFACE**



Section 28 of the Public Audit Act, CAP 418 [R.E. 2021] gives mandate to the Controller and Auditor General to carry out Performance Audit (Value-for-Money Audit) to establish the economy, efficiency and effectiveness of any expenditure or use of resources in the Ministries, Departments and Agencies (MDAs), Local Government Authorities (LGAs) and Public Authorities and Other Bodies which involves enquiring, examining, investigating and

reporting, as deemed necessary under the circumstances.

I have the honour to submit to Her Excellency, the President of the United Republic of Tanzania, Hon. Dr. Samia Suluhu Hassan, and through her to the Parliament of the United Republic of Tanzania, the Performance Audit Report on the Management of Invasive Alien Species in Terrestrial Environment.

The report contains findings, conclusions, and recommendations that are directed to the Vice President's Office - Division of Environment (VPO-DoE).

The Vice President's Office - Division of Environment (VPO-DoE) had the opportunity to scrutinize the factual contents of the report and comment on it. I wish to acknowledge that discussions with the Vice President's Office - Division of Environment (VPO-DoE) have been useful and constructive.

My Office will carry out a follow-up audit at an appropriate time regarding actions taken by the Vice President's Office - Division of Environment (VPO-DoE) in implementing the recommendations given in this report.

In completing the audit assignment, I subjected the draft report to a critical review of subject matter experts, namely Prof. Japhet Kashaigili from Sokoine University of Agriculture and Dr. Catherine A. Masao form the University of Dar es Salaam who came up with useful inputs for the improvement of this report.

The report was prepared by Mr. Joseph Nkengele (Team Leader), Mr. Alfa Tandise and Mr. Frank Mwalupale (Team Members) under the supervision and guidance of Mr. Michael Malabeja (Chief External Auditor), Mr. James Pilly (Assistant Auditor General) and Mr. George Haule (Deputy Auditor General).

I would like to thank my staff for their commitment in preparing this report. I also acknowledge the audited entities for their cooperation with my Office, which facilitated the timely completion of the audit.

Charles E. Kichere

Controller and Auditor General United Republic of Tanzania March, 2023

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#### LIST OF ACRONYMS AND ABBREVIATIONS

AEWA Agreement of the Conservation of African-Eurasian Migratory

Water Birds

CoESE College of Earth Sciences and Engineering (UDOM)

DoE Division of Environment

EIA Environmental Impact Assessment

EMA Environmental Management Act

GPD Gross Domestic Product

GISP Global Invasive Species Programme

GMOs Genetically Modified Organisms

IASs Invasive Alien Species

ISPMs International Standards for Phytol-sanitary Measures

IUCN International Union for Conservation of Nature

LGAs Local Government Authorities

LVBWB Lake Victoria Basin Water Board

LVEMP Lake Victoria Environment Management Project

MDAs Ministries, Departments and Agencies

MoA Ministry of Agriculture

MoU Memorandum of Understanding

MoW Ministry of Water

NBSAP National Biodiversity Strategy and Action Plan

NCAA Ngorongoro Conservation Area Authority

NEAP National Environmental Action Plan

NGOs Non-Governmental Organizations

NISSAP National Invasive Species Strategy and Action Plan

PO-RALG President's Office - Regional Administration and Local

Government

SDG Sustainable Development Goals

SPs Sanitary and Phyto-sanitary measures

TAFIRI Tanzania Fisheries Research Institute

TANAPA Tanzania National Parks Authority

TARI Tanzania Agriculture Research Institute

TAWA Tanzania Wildlife Management Authority

TAWIRI Tanzania Wildlife Research Institute

TEEA Tanzania Environment Experts Association

TFS Tanzania Forest Service Agency

TOSCI Tanzania Official Seed Certification Institute

TPHPA Tanzania Plant Health and Pesticides Authority

URT United Republic of Tanzania

VPO Vice President's Office

WWF World Wildlife Fund for Nature

#### **DEFINITION OF TERMS**

# Biological diversity (Biodiversity)

Variability among living organisms and the ecological complexes of which they are part. This includes diversity within species, between species and of ecosystems.

#### **Escape**

Invasive Species pathways whereby species are introduced through activities in agriculture, aquaculture/mariculture, botanical garden/zoo/aquaria, farmed animals, forestry, fur farms, horticulture, ornamental purpose, pet/aquarium species, research (in facilities), live food and live baits, later escape boundaries of introduction to other areas.

#### **Ecosystem**

A community of organisms interacting with one another and with the environment in which they live.

# Invasive Alien Species

Species introduced intentionally or unintentionally outside their natural habitats where they have the ability to establish themselves, invade, out-compete natives and take over the new environments.

#### **Pathways**

The manner in which the Invasive Species are transported, intentionally or unintentionally outside their natural geographical range.

#### Release

Invasive Species pathways whereby species introduced as a result of biological control, conservation activities, erosion control/ dune stabilization, fishery in the wild, hunting in the wild, landscape/flora/fauna improvement, other Intentional release, release in nature for use.

#### Surveillance

Monitoring for the purpose of detecting the arrival of new Invasive Alien Species.

# Transport Contaminant

Invasive Species pathways whereby species are introduced as contaminants in nursery material, contaminants on animals, contaminant on plants, contaminated bait, food contaminants, parasites on animals, parasites on plants, seed contaminant, timber trade, transportation of habitat material.

Transport stowaway

Invasive Species pathways whereby species are introduced due to importation/transportation of angling/ fishing aquaculture equipment, container/bulk, hitchhikers in or on plane, hitchhikers on ship/boat, machinery/equipment, organic packing material, people and their luggage, ship/boat ballast water and vehicles.

Terrestrial Environment

Refers to an environment that is mainly made up of landforms.

Unaided

Invasive Species pathways whereby species are introduced/spread through natural dispersal across borders.



#### **EXECUTIVE SUMMARY**

Like many other developing countries in the world, Tanzania's development largely depends on the use of its natural resources for ecosystem services. For example, the livelihoods of about 80% of rural population depend on land for agriculture and livestock grazing. The country's economy mostly depends on agriculture, which accounts for more than one quarter of GDP and provides 85% of exports. The major feed resources (90%) come from the rangelands of about 50 million hectares (ha), of which the land for grazing is about 10.5% (NISSAP, 2019-2029).

While Tanzania's development depends much on the use of natural resources, the country is threatened by invasion of alien species. Invasive Alien Species are plants, animals (including fish), and micro-organisms that are introduced outside their natural habitats and that can harm the environment, the economy, or society. Many Invasive Alien Species change ecosystem functioning and the delivery of ecosystem services by altering nutrient and contaminant cycling, hydrology, habitat structure, and disturbance regimes.

Cedrella odorata in Kimboza Catchment Forest (Morogoro Region) have colonised a large part of the forest, crowding out native species and almost replacing the indigenous tree species<sup>1</sup>. In Kongwa District, a noxious weed known as *Astripomoea Hyoscyamoides* (Kongwa weed) has invaded the area and threatened land productivity in crops and pasture. Kongwa weed is currently invading some other areas such as Handeni, Kiteto, Singida, Kondoa, Chamwino, Bahi, Gairo, Morogoro, Korogwe, Mwanga, Manyoni, Ruvu-Pwani and Nkasi districts of Tanzania<sup>2</sup>.

<sup>1</sup> The National Biodiversity Strategy and Action Plan (NBSAP) 2015 - 2020

<sup>&</sup>lt;sup>2</sup> Research on Enhancing Rangeland Productivity and Community Livelihoods through Integrated Management of Noxious Weeds in Kongwa District prepared by SUA, 2019

Due to the spread of invasive species in the protected areas and the national parks, it has led to significant cost for controlling the invasive species in those areas. For example, TANAPA annually spends more than TZS 1 billion to control Invasive Alien Species<sup>3</sup>.

Based on the above situation, the Controller and Auditor General decided to conduct a performance audit on the management of the Invasive Alien Species in the country. The objective was to assess whether the VPO has adequately managed the Invasive Alien Species in terrestrial environments in order to prevent and control the negative impacts to biodiversity, ecosystems and economic loss in the country.

The audit focused on four aspects namely; prevention measures, control measures; coordination with the Sectoral Ministries and the aspect of monitoring and evaluation in the management of Invasive Alien Species in Terrestrial Environment. The terrestrial environment was selected because it is invaded by a larger number of invasive species than the aquatic environment.

Moreover, the audit covered a period of four (4) financial years, from 2018/19 to 2021/22. This period of time was selected in order to establish the performance trend towards the implementation of National Invasive Species Strategy and Action Plan (NISSAP, 2019 - 2029).

The main audited entity was the Vice President's Office-Division of Environment (VPO-DoE), because it was the parent ministry at the time of this report responsible for coordinating the management of Invasive Alien Species in the country.

Three main methods were used for the collection of evidence in a more concrete and reliable manner. The methods used were: interviews, document reviews and physical observations. Through these methods, the audit came up with following findings, conclusion and recommendations.

<sup>&</sup>lt;sup>3</sup> Report on Invasive Alien Organisms prepared by TANAPA, 2019

### Main Findings

### Extent of Invasion by Alien Species in Terrestrial Environment

The Invasive Alien Species have occupied potential area in Agriculture, Wildlife, and Forestry sectors of economy. TANAPA was invaded by 70 different types of invasive plants covering an estimated area of 541.94 km² that is equivalent to 0.52 % of the total area coverage of all National Parks in the country. It was further noted that out of 286.8 km², 21.34 km² of the covered forestry area targeted in this audit were invaded. This makes 7.4 % of the total forestry area invaded by different types of Invasive Alien Species, especially the *lantana camara* species.

# Inadequate Prevention of the Invasive Alien Species at the International Borders (Ports of Entry)

It was noted that, the VPO in collaboration with MoA through TPHPA did not manage to inspect intentionally or unintentionally the introduction of the Invasive Alien Species through the ports of entry. This was due to inadequate number of human resources to serve the border entries, incompleteness of the inspection of the imported plant products and inadequate amount of equipment for inspection at the border entries.

# Absence of National Database of Information for Invasive Alien Species

It was found that the VPO in collaboration with other key actors in the management of Invasive Alien Species did not develop National Invasive Species Database. Due to this, it was noted that, the country was only reactive since it did not have enough information on the Invasive Alien Species. In most cases, the information on invasive species is obtained after the introduction and notable spread of such species.

# Inappropriate Methods to Control the Negative Impacts of Invasive Alien Species

Out of three (3) selected sectors of economy (Wildlife, Agriculture and Forestry), only one (1) sector that is agricultural sector was noted to use method of controlling Invasive Alien Species, especially through chemical control that had positive results.

It was also noted that Kongwa DC did not establish any measures to control the abundance and spread of the *Kongwa Weed*. The issue of control of that weed was left to the individuals to utilize their own local measures to control the weeds.

# VPO has not adequately facilitated Coordination among the Key Players

The management practice of Invasive Alien Species is fragmented, that is each sector is carrying out the management at its own interest. It was noted that, division meetings within VPO, Sector Directors' meetings, National Steering Committee meetings, Sector Ministers' Meetings and Stakeholders' meetings were not done as planned. It was noted that, there were no reports or information sharing among them on the issues regarding the management of Invasive Alien Species availed to auditors for scrutiny.

Due to isolated efforts as well as insufficient sharing of information and cooperation among sectors, there was the likelihood for be the extension and magnification of the problem to the highest levels of impacts resulting from Invasive Alien Species.

# Ineffective implementation of Reporting Systems

Despite the fact that the NISSAP had set reporting system, the Audit noted that the system was not functioning effectively. This was reflected by lack of implementation reports on the management of Invasive Alien Species from sectoral ministries and LGAs to VPO.

# Inadequate use of the Developed Performance Indicators by the VPO

Despite the fact that VPO had developed the indicators for measuring the performance towards implementing NISSAP, VPO did not use those performance indicators for assessing the performance towards addressing national strategy for the management of invasive species. This was attributed to inadequate prioritization of the management of Invasive Alien Species by VPO.

#### **Audit Conclusion**

Despite the fact that the Government of Tanzania has undertaken some initiatives, such as the establishment of NISSAP (2019-2029) in order to manage the occurrence of Invasive Alien Species in terrestrial environment, it was observed that the Invasive Alien Species were not adequately managed.

The prevention measures against the Invasive Alien Species in Terrestrial Environment were noted to be inadequate. This was indicated by the fact that, VPO did not identify and manage the priority pathways and vectors of the Invasive Alien Species, inadequate prevention of the Invasive Alien Species at the Ports of Entry. Moreover, the VPO in collaboration with the Sectoral Ministries did not manage to conduct Risk and Environmental Impact Assessment of Potential Invasive Alien Species to enable effective prevention of the introduction and spread of Invasive Alien Species.

Furthermore, there were weaknesses in the control measures used by the VPO and Sectoral Ministries in controlling the Invasive Alien Species in the country. This was manifested by the absence of national database for Invasive Alien Species, inadequate research on Invasive Species, inadequate development of goals to control the Invasive Alien Species and inadequate enforcement of plans to control these species. It was also noted that, there was minimum utilization of resources to control the Invasive Alien Species as well as ineffective methods to control the negative impacts of the Invasive Alien Species.

It was further revealed that, there was no combined effort and coordination to ensure adequate management of Invasive Alien Species in the country. This was reflected by absence of combined efforts for implementation of NISSAP (2019-2029) by all responsible agencies, inadequate sharing of information across the sectors and all stakeholders, and inadequate trans-boundary cooperation.

The monitoring and evaluation of the management of Invasive Alien Species in the country was not adequately done. This was due to the absence annual program for monitoring and evaluation, ineffective reporting system, inadequate application of developed targets and performance indicators on the management of Invasive Alien Species and lack of follow ups and performance review meetings to establish the status of implementation of plans to manage the Invasive Alien Species.

#### **Audit Recommendations**

The audit recommends as follows:

The VPO in collaboration with the relevant Sectoral Ministries is urged to:

- Establish mechanism that will ensure effective preventive measures of the Invasive Alien Species at the Ports of Entry and the entrance of the protected areas and national parks;
- (ii) Strengthen the strategies to ensure that researches are conducted on introduction, spread and impacts of Invasive Alien Species in the country;
- (iii) Strengthen the capability of its workforce with expertise in invasive alien prevention and control measures;
- (iv) Establish a mechanism that will ensure short and long-term plans are aligned with the emergency response procedures for early detection of Invasive Alien Species;

- (v) Develop and strengthen a centralized National Invasive Species Database to be used to record and track invasive species occurrences and control efforts across the country;
- (vi) Improve advocacy, public awareness and sensitization on Invasive Alien Species and their control measures;
- (vii) Establish a mechanism to ensure that measures for effective collaboration and coordination in the management of Invasive Alien Species are adopted by all key actors;
- (viii) Develop a system to facilitate trans-boundary cooperation between the country (Tanzania) and all neighbouring countries in the Management of Invasive Alien Species; and
  - (ix) Develop and implement monitoring and evaluation program for the management of Invasive Alien Species in the country.

#### **CHAPTER ONE**

#### INTRODUCTION

## 1.1 Background of the Audit Area

Proper use and efficient management of natural resources are critical to shaping a sustainable future in many resource-rich countries in Africa. Tanzania's economy, like in any other developing country, depends much on using natural resources. For example, 80% of rural population depends on land for agriculture and livestock keeping<sup>4</sup>. The contribution of agriculture for export is 85% while it contributes to about 25% into the National GDP.

While Tanzania's development depends much on the natural resources, the latter are threatened by invasion of alien species. Invasive species are plants, animals (including fish), and micro-organisms that are introduced outside their natural habitats and that can harm the environment, the economy, or society. Many Invasive Alien Species change ecosystem functioning and the delivery of ecosystem services by altering nutrient and contaminant cycling, hydrology, habitat structure, and disturbance regimes.

For example, invasion of the alien trees known as *Cedrella odorata* in Kimboza Catchment Forest (Morogoro Region) has affected a large part of the forest, crowding out native species and almost replacing the indigenous tree species<sup>5</sup>.

The management of Invasive Alien Species is expensive and can result to economic loss. The National Invasive Species Strategy and Action Plan (2019-2029) estimated that, the invasion of alien species in mixed maize farming system costs about US\$ 156-190 million per annum<sup>6</sup>. It was further reported that, the Tanzania National Parks Authority (TANAPA) and the

<sup>&</sup>lt;sup>4</sup> National Invasive Species Strategy and Action Plan (2019-2029)

<sup>&</sup>lt;sup>5</sup> The National Biodiversity Strategy and Action Plan (NBSAP) 2015 - 2020

<sup>&</sup>lt;sup>6</sup> Pratt et al. 2017

Ngorongoro Conservation Area Authority had spent more than TZS 1 billion for managing the Invasive Alien Species in the financial year 2018/19.

#### 1.2 Motivation of the Audit

The presence of exotic plant and animal species in Tanzania's ecosystem is a growing problem. Some of these species have the ability to harm livestock and crops, degrade habitats, wipe out native species, and pose a health risk to humans. These alien species out-compete native species and can devastate biodiversity and ecosystem functions.

The motivation to carry out this audit came from the fact that, there has been public concerns on the lack of strong commitment by Government Agencies responsible for managing invasive species. These Government Agencies did not adequately take measures to prevent and mitigate the negative effects of the spread of invasive species in the country.

On the other hand, Tanzania has committed to achieving the United Nations' 2030 Agenda for Sustainable Development. The proposed audit supports to assess the implementation of Goal 15 of Sustainable Development Goals (SDGs) of life on land. This goal sets a target to introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems.

The indication of performance problems related to the management of Invasive Alien Species is briefly presented as follows:

### a) Existence of Invasive Plant Species in the National Parks

According to the report on Scaling Out and Assessing Efficacy of the Nature-Based Approaches for Controlling and Restoring Areas Invaded by Invasive Alien Species in Ngorongoro Conservation Area (NCAA) of 2022, it was reported that the Ngorongoro Conservation Area has faced invasive species covering 8,292 squares kilometres and has been detrimental to the survival of livestock and wildlife in the area. These species include but not limited to *Tagetes minuta*, *Bidens schimperi* and *Gutenbergia cordifolia*.

These plants have threatened the survival of the flora and fauna in the Ngorongoro Conservation Area.

Furthermore, the report on existence of exotic plants in Tanzania by Emily Kopania (2019)<sup>7</sup> indicated the existence of different newly emerged exotic grasses in five different National Parks in the country, including the Ngorongoro Crater, Serengeti National Park, Tarangire and Arusha National Parks. These invasive species are growing at higher rates than the native grasses. This implies that, they displace native grass species and alter the natural systems.

In addition, the report on the Extent and Severity of Invasive Alien Species in National Parks prepared by TANAPA in April 2022 for submission to the Law Enforcement and Management of Parks Committee (LEMPC) of the Board of Trustees by TANAPA provides that, the national parks have been invaded by various invasive species such as *Acacia mearnsii*, *Acacia melanoxylon* and others. These impacts may extend to significant changes in the structure and natural or normal functioning of the ecosystem of the area that has been invaded<sup>8</sup>.

# b) Colonization of the Terrestrial Habitats by Invasive Alien Plants

The National Biodiversity Strategy and Action Plan (NBSAP) 2015 - 2020 reported that, in Kimboza Catchment Forest (Dar es Salaam Region), the invasive alien trees known as *Cedrella odorata* has affected more that 75% of the native forest, crowding out native species and almost replacing the indigenous tree species.

7 Exotic Plants in Tanzania. September 22, 2019 (https://www.youtube.com/watch?v=5NjFKe1cptQ)

<sup>&</sup>lt;sup>8</sup> Report on Extent and Severity of Invasive Alien Species in National Parks prepared by TANAPA in April 2022 for submission to the Law Enforcement and Management of Parks Committee (LEMPC) of the Board of Trustees by TANAPA

Moreover, the National Biodiversity Strategy and Action Plan (NBSAP) 2015 - 2020 reported that, *parthenium weed*<sup>9</sup> has been accidentally introduced in Tanzania. The weed is reported to cause up to a 40% reduction in crop yields, and it reduces the grazing areas by displacing pasture species in areas it has invaded. It also recognizes the *Prosopis juliflora* species, which are found throughout same district and can seriously harm livestock and agricultural land in the northern dry lands if left managed.

In addition, a research project on enhancing rangeland productivity and community livelihoods through integrated management of noxious weeds in Kongwa District conducted by Mwalongo *et al.* (2020) indicated that, a noxious weed known as *Astripomoea hyoscyamoides* has invaded the area and led to decline of land productivity in crops and pasture. *Kongwa weed* is now invading various areas in Tanzania including Handeni, Kiteto, Singida, Kondoa, Chamwino, Bahi, Gairo, Morogoro, Korogwe, Mwanga, Manyoni, Ruvu-Ruvu, Nkasi and other districts of Tanzania<sup>10</sup>. **Photo 1.3** indicates invasion of noxious weeds in Kongwa District.



Photo 1.1: Invasion of noxious weeds in Kongwa District, source: Kongwa weed research project published on 13<sup>th</sup> December 2019 by Sokoine University of Agriculture

<sup>9 (</sup>Actual report from NEAP)

<sup>&</sup>lt;sup>10</sup> https://www.sua.ac.tz/news/kongwa-weed-research-project-launched

# c) Invasion by the Indian House Crow in the Indian Coastal Areas

The National Invasive Species Strategy and Action Plan (NISSAP) (2019-2029) indicates that the Indian House Crows were introduced in Tanzania through the Islands in 1980s. The species spread rapidly onto the mainland along the coast from Malindi (Kenya) to Mtwara (Tanzania).

It has been observed that these species have occupied the whole coastal areas in the mainland of Tanzania, including neighbouring countries of Kenya, Somalia and Ethiopia.

The recently statistics indicates that the specie has further occupied the mainland regions of Morogoro, Tanga, Pwani, Dodoma and some parts of Tabora (Nzega District). **Photo 1.4** indicates the Indian House Crow that has invaded most of the coastal regions in Tanzania.



Therefore, using its legal mandate, the National Audit Office of Tanzania decided to carry out performance audit on the management of the Invasive Alien Species in the country.

### 1.3 Audit Design

# 1.3.1 Main Objective

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The main objective of the audit was to assess whether the VPO has adequately Coordinate the management of Invasive Alien Species in terrestrial environments in order to prevent and control the negative impacts to biodiversity, ecosystems and economic loss in the country.

In order to achieve this audit objective, the audit assessed whether:

- (i) The management of the prevention measures against the Invasive Alien Species in Terrestrial Environment was adequate;
   (ii) The control measures for management of Invasive Alien Species in Terrestrial Environment were effective:
  - (iii) The VPO adequately coordinated with the Sectoral Ministries in the management of Invasive Alien Species in Terrestrial Environment; and
  - (iv) The VPO and the Sectoral Ministries adequately monitors and evaluates the effectiveness of strategies to manage the Invasive Alien Species in Terrestrial Environment.

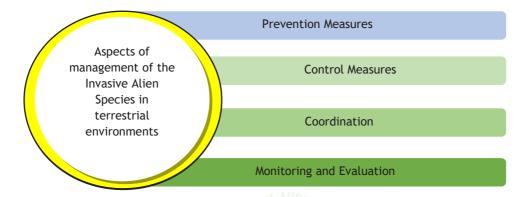
In order to address the specific audit objectives above, the Audit Team developed four (4) main audit questions and sub audit questions presented in *Appendix 2*.

### 1.3.2 Audit Scope

The main audited entity was the Vice President Office - Division of Environment (VPO-DoE). The VPO was selected as it is mandated to formulate policies, guidelines and standards for the management of the Invasive Alien Species in the country. Further, the VPO-Division of

Environment is the overall overseer of environmental conservation matters in the country, including the management of Invasive Alien Species.

In order to address the issue of management of Invasive Alien Species, the following aspects were covered:



On the prevention measures, the audit assessed the identification and classification of Invasive Alien Species, management of priority pathways and vectors of invasive species, risk and environmental impact assessment of potential Invasive Alien Species as well as the effectiveness of measures to prevent the Invasive Alien Species.

With regards to control measures, the audit focused on assessment of the reliability of database for Invasive Alien Species, development of realistic goals towards control of Invasive Alien Species, effective enforcement of the planned control measures for the Invasive Alien Species and capacity building campaigns to ensure that the Invasive Alien Species are controlled.

Furthermore, the Audit assessed the use of the available resources to ensure effective control of Invasive Alien Species as well as the effectiveness of measures taken to control the negative impacts of Invasive Alien Species.

On coordination, the audit assessed the availability of clearly defined roles and responsibilities of key actors in the management of Invasive Alien Species, the capacity and resources of responsible key actors and functionality of the existing system of reporting between the VPO and the Sectoral Ministries on the management of Invasive Alien Species. Further, the audit assessed the effectiveness of the mechanism (system) for coordination and communication of management of Invasive Alien Species.

With regards to monitoring and evaluation, the Audit Team assessed plans to monitor and evaluate the implementation of strategies to manage the Invasive Alien Species as well as the development of targets and/or indicators for measuring the efficiency, effectiveness, and impact of the strategies on the management of the Invasive Alien Species in terrestrial environment. Moreover, the audit assessed regularity of reporting on the performance of the management of Invasive Alien Species, usability of results from monitoring and evaluation and effectiveness of follow up on the implementation of recommendations from monitoring and evaluation reports.

The audit mainly focused on the management of Invasive Alien Species in *Terrestrial Environment*. The terrestrial environment was selected because it is invaded by a larger number of invasive species than other types of environments such as the aquatic environment. This audit, therefore, covered alien species that might or have invaded terrestrial environment.

Ten types of species which have a significant impact on terrestrial in environment are shown hereunder:

#### Invasive Alien Species Covered

Spodoptera frugiperda; Indian house Crow; Tuta absoluta; Astripomoea hyoscyamoides; Chromolaena odorata; Gutenbergia cordifolia; Parthenium hysterophorus; Caesalpinia decapetala; Leptocybe invasa and This audit covered four financial years from 2018/19 to 2021/22 in order to establish the performance trend. The rationale was enabling the Audit to come-up with reasonable analysis for the purpose of drawing a sound conclusion based on the performance trend.

#### 1.3.3 Assessment Criteria

The following are the assessment criteria for each of the specific audit objectives that were used to assess the performance of the audited entities regarding the management of Invasive Alien Species in Terrestrial Environment.

# (a)The management of the prevention measures against the Invasive Alien Species in Terrestrial Environment

- Objective 1 of the National Invasive Species Strategy and Action Plan (NISSAP) (2019 - 2029) requires the sectorial ministries to set targets of identifying and managing priority pathways and vectors of invasive species introduction and spread.
- Section 8(2) of the Plant Protection Act of 1997, revealed that, plant or plant product, harmful organism, beneficial organism, or soil imported into Tanzania, shall be clearly identified, declared to an inspector and be made available for an inspection or any subsequent action.
- ❖ Section 32(2) (b) of the Plant Protection Act, 1997 directs the Minister to define duties and rights of the Research Institute which shall include, but not limited to perform plant quarantine, investigation, research and coordination.
- Objective 1.1.2 of the National Invasive Species Strategy and Action Plan (NISSAP) (2019 - 2029) requires the sectorial Ministries to conduct risk assessment of potential Invasive Alien Species.

- ❖ Goal 15.8 of the 2030 Agenda for Sustainable Development Goals (SDGs) suggests that by 2020, measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority species should be introduced.
- (b) The effectiveness of the control measures for management of Invasive Alien Species in Terrestrial Environment
- ❖ Section 3.10.3 (i) of the National Agricultural Policy, October 2013 requires the Ministry of Agriculture to monitor and evaluate pest and disease surveillance system, and ensure that control mechanisms are strengthened.
- ❖ Section 4.4 (a) of the Agricultural Sector Development Strategy (2016-2025) requires the Ministry of Agriculture to state on early warning system and pest and disease surveillance system for early detection of disaster.
- Section 29(4) of the National Parks Act No. 11, 2003, directs the Ministry of the Natural Resource and Tourism to inform on the introduced vegetation to be destroyed or dealt with accordingly.
- Regulation 51 of the Wildlife Conservation (Wildlife Management Areas) Regulations (2018), prohibit introduction or re-introduction of non-indigenous of wildlife, bees, trees or fish in wildlife management areas unless a written approval of a competent authority in accordance with written laws is obtained.
- ❖ Section 37 (c) of the Grazing Land and Animal Feeding Resources Act No. 13 of 2010 mandates the Local Government Authority to introduce or remove flora or fauna for the purpose of prevention or improvement of the grazing-land.
- Section 4.3.7 (iv) of the National Environmental Research Agenda, 2017-2022 mentions the Terrestrial Ecosystem and Biodiversity

especially the Invasive and Alien species as one of the priority research areas.

#### (c) Coordination between the VPO and Sectorial Ministries

- ❖ Section 15 (a) of the EMA Act No. 20 of 2004 insists the Director of Environment to coordinate various environment management activities being undertaken by other agencies and promote the integration of environment considerations into development policies, plans, programmes, strategies, projects and undertake strategic environmental risk assessment with a view to ensuring the proper management and rational utilization of environmental resources on a sustainable basis for the improvement of the quality of human life in Tanzania.
- Section 4.1.2 of the National Invasive Species Strategy and Action Plan (NISSAP) (2019 - 2029) entitles the VPO to coordinate the implementation of strategies to deal with Invasive Alien Species. The VPO through Biodiversity Section shall work in collaboration with Sectoral Ministries for implementation of the strategies to manage the Invasive Alien Species.
- Objective 5, Action 5.2.3 of the NISSAP (2019-2029) insists on establishment of roles and responsibilities of all organizations, groups, agencies and individuals involved in the management of Invasive Species in the country.
- ❖ Section 9.7 of the National Biodiversity Strategy and Action Plan (NBSAP) (2015-2020) targets at establishment and promotion of national, regional and international cooperation/agreements among key actors on the management of IAS by 2020.

# (d) Monitoring and evaluation of performance of strategies to manage the Invasive Alien Species

- ❖ Section 32 (1, a) of the EMA, 2004 requires the sectoral ministries through the Sector Environmental Coordinator to submit to the Director of Environment a bi-annual report concerning the state of that segment of the environment and the measures taken by that sector Ministry to maintain or improve the environment.
- ❖ Section 15 (d) of the EMA Act, 2004 requires the Director of Environment to monitor and assess the activities being carried out by relevant agencies in order to ensure that the environment is not degraded by such activities, environmental management objectives are adhered to and adequate early warning on impending environmental emergency is given.
- Section 4.2 of the National Invasive Species Strategy and Action Plan (NISSAP) (2019 - 2029) requires the VPO in collaboration with Sectoral Ministries to ensure effective monitoring and evaluation of all undertakings for management of Invasive Alien Species.
- ❖ Section 3.10.3 (i) of the National Agriculture Policy, 2013 requires the Ministry of Agriculture to monitor and evaluate Pest and disease surveillance system, and ensure that control mechanisms are strengthened.

### 1.4 Sampling, Data Collection and Analysis Methods

Various methods for sampling, data collection and analysis were used as presented below:

### 1.4.1 Sampling Methods

Purposive and random sampling methods were used to select types of Invasive Alien Species, sectors affected, and key actors to be covered during the audit. This audit covered 10 types of Invasive Alien Species namely: Spodoptera Indian house Crow; Tuta absoluta; Astripomoea frugiperda; hyoscyamoides; Chromolaena odorata; Gutenbergia cordifolia; Parthenium hysterophorus; Caesalpinia decapetala; Leptocybe invasa and Lantana camara. These species were selected because of their higher rates of spread than that of others, and they have greater negative impacts to the economy, health and environment than others. Appendix 3 provides details of the selected Invasive Alien Species and reason(s) for their selection.

The sampled sectors were Wildlife, Agriculture and Forestry because these are sectors highly affected by the Invasive Alien Species than other sectors as indicated in **Figure 1.1**.

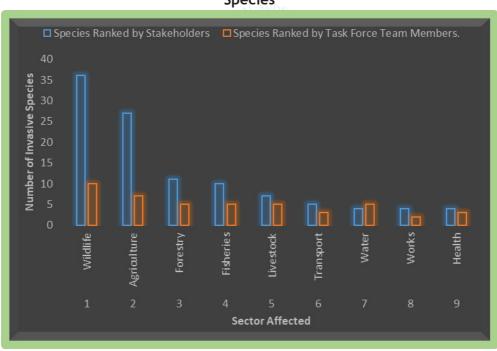


Figure 1.1: Ranking of Sectors Based on the Effects of Invasive Alien Species

**Source:** Analysis of the Stakeholders' and Task Force Team Member's ranking from the National Invasive Species Strategy and Action Plan (NISSAP) (2019 - 2029).

Selection of regions covered during the audit was done by first clustering the regions into five geographical zones namely Central Zone, Northern Zone, Lake (West) Zone, Southern Highlands Zone and Eastern Zone. One region was selected to represent each geographical zone. The selection was based on the type, number and level of impacts of invasion by alien species. Therefore, five (5) regions namely Dodoma, Morogoro, Arusha, Mara and Mbeya were selected.

**Table 1.1** provides a summary of the selected regions, along with the type of Invasive Alien Species selected, and the sectors that are mostly affected. Further details of the sampled Invasive Alien Species, regions and reasons for selection are provided in *Appendix 3*.

Table 1.1: Selected Regions and Predominant Invasive Alien Species covered during the Audit

Zones	Region Selected	Type of Invasive Species	Sector Affected
Central Zone	Dodoma	Astropomoea hyscamoedes (Kongwa Weed)	Agriculture
Eastern Zone	Morogoro	Tuta absoluta (Tomato Leaf Miner), Spodoptera frugiperda (Fall armyworm) and Corvus splendens (Indian House Crow)	Wildlife and Agriculture
Northern Zone	Arusha	Parthenium hysterophorus (Carrot Weed and Gutenbergia)	Agriculture and Wildlife
Lake (West) Zone	Mara	Chromolaena odorata (Siam Weed)	Agriculture and Wildlife
Southern Highlands Zone	Mbeya	Tuta absoluta (Tomato Leaf Miner), Spodoptera frugiperda (Fall armyworm), Lantana camara (Tickberry, Lantana) and Leptocybe invasa (Blue gum chalcid)	Agriculture and Forest

**Source:** Auditors' Analysis on the List of Predominant Invasive Species (2022)

Furthermore, purposive sampling technique was used to select Ports of Entry for assessing the effectiveness of preventive measures for managing the Invasive Alien Species. The selected Ports of Entry are; the borders of Namanga, Sirari and Kasumulu, and Kilimanjaro International Airport. The selection was done to ensure that each Port of Entry falls within the selected geographical zones. Moreover, potentiality of the Ports of Entry towards entry of Invasive Alien Species in the country was also used to sample the Ports of Entry. *Appendix 4* presents the detailed analysis of the selected Ports of Entry.

In addition, the Audit Team visited some of the key actors on the management of Invasive Alien Species for verification purposes. The selected stakeholders are; the President's Office-Regional Administration and Local Government (PO-RALG), the Ministry of Agriculture (MoA), the Ministry of the Natural Resource and Tourism, TARI, TAWIRI, TPHPA, TFS, TANAPA, Regional Secretariats and Local Government Authorities.

### 1.4.2 Methods Used for Data Collection

Both qualitative and quantitative data were collected to provide evidence on the Management of the Invasive Alien Species by VPO-DoE, PO-RALG, Ministry of Agriculture (MoA) and Ministry of the Natural Resource and Tourism. Three methods were used to collect the required data. These were *interview*, *document reviews* and *physical verification* as detailed below:

### (a) Documents Review

Documents were reviewed in order to obtain appropriate and sufficient information to enable the Audit Team to come up with clear findings which are supported by sufficient and appropriate evidences.

The reviewed documents from the audited entities were those falling within the period under the audit (2018/19 to 2021/22). The documents included Planning Documents, Performance and Progress reports,

Monitoring and Evaluation Reports. The details of the documents reviewed and reasons for the interview are provided in **Appendix 5**.

### (b) Interviews

To be able to respond to the audit questions and provide adequate conclusions against the audit objective, interviews were used to collect information during the audit so as to get a broader understanding of the audit areas and identify existing challenges, root causes and eventually the consequences to those problems and challenges. **Appendix 6** provides a list of officials that were interviewed during the audit and the reasons for interviewing them.

## (c) Physical Verification

The Audit Team conducted site visits in five regions namely Dodoma, Morogoro, Arusha, Mara and Mbeya. This method assisted the Audit Team to observe the state of prevention and control of the Invasive Alien Species in the respective areas.

At Ports of Entry, the Audit verified the availability of the inspection facilities, personel, quaranteen equipment and other prevention measures put in place.

Furthemore, Audit observed the effectiveness of control measures put in places (mechanical, biological, physical, manual or chemical). This observation was undertaken at the Serengeti National Park, Kongwa National Ranch, plantation areas and Rungwe Forest Reserve.

In all visited sites, auditors were taking notes and pictures as evidence of what have been observed.

## 1.4.3 Methods for Data Analysis

Data analysis consisted of examining, categorizing, tabulating, or/otherwise recombining both quantitative and qualitative evidence to

address the audit objective, **Figure 1.2** shows the methods used for data analysis.

A. Qualitative Analysis extracted The quantified **Analysis** recurring techniques used to concepts or facts concepts or facts information analyse qualitative either quantified were (concepts/facts) data by identifying tabulated depending on the was then summeddifferent concepts presented as they nature of data up or averaged in are to explain or portrayed; and spreadsheets to establish originating from explain or relationship establish the interviews between document reviews relationship different between different categorise them based on its variables variables. assertion; originating from the audit **Quantitative Analysis** The data was Also, the qualitative Other quantitative quantitatively, analysis employed to information/data with analysed and analyse some of the single occurrence were compiled using interview questions presented as they are in Microsoft Excel. the reports by Then, the analysed explaining the facts data was presented through different they assert. ways including tables, histograms, line graphs and percentage distribution.

Figure 1.2: Methods of Data Analysis

#### 1.5 Data Validation Process

The Vice President's Office was given the opportunity to go through the draft report and comment on the figures and presented information. The VPO confirmed on the accuracy of the figures used and information presented in the report.

In the same way, the draft report was also submitted to the subject matter experts in the field of Invasive Species to get their independent opinions and authenticate factual contents of the details presented in the report.

### 1.6 Standards Used for the Audit

The Audit was conducted in accordance with the International Standards of Supreme Audit Institutions (ISSAIs) issued by the International Organization of Supreme Audit Institutions (INTOSAI). These standards require the Audit to be planned and performed in order to obtain sufficient and appropriate evidence to provide a reasonable basis for findings and conclusions based on the Audit objective.

## 1.7 Structure of the Audit Report

The remaining part of the report covers the following:

System for managing the Invasive Alien species in Chapter Terrestrial Environment Two Findings on the Extent of Invasion by the Invasive Alien Chapter Species in the Country Three Findings on the Implementation of Preventive Measures Chapter of the Invasive Alien Species Four Findings on the Implementation of the Control Measures Chapter of the Invasive Alien Species Five Findings on Coordination, Monitoring and Evaluation Chapter Six **Audit Conclusions** Chapter Seven Audit Recommendations Chapter Eight

### **CHAPTER TWO**

## SYSTEM FOR MANAGING THE INVASIVE ALIEN SPECIES IN TERRESTRIAL ENVIRONMENT

#### 2.1 Introduction

This chapter describes the policy and legal framework governing the system for the management of Invasive Alien Species in the country. It further presents the roles, and responsibilities of key actors involved. The chapter also describes the processes for the management of Invasive Alien Species.

## 2.2 Legal Frameworks

Tanzania does not have a stand-alone policy to guide Sectoral Ministries in the management of Invasive Alien Species. The Sectoral Ministries address Invasive Alien Species management issues implicitly through their sectoral policies, acts, regulations, and guidelines. However, Invasive Alien Species were identified as one of the country's environmental issues or impacts in the National Environmental Policy of 2021.

#### 2.2.1 Policies

There are a number of policies which are related to the Management of Invasive Alien Species in Tanzania. The most relevant policies are summarized in **Table 2.1** below:

Table 2.1: Policies Related to the Management of Invasive Alien Species in the Country

National Environmental Policy (2021)	Section 3.3 (vii) of the National Environmental Policy of 2021 emphasizes on promotion of preventive and management measures against invasive species. This should be done by strengthening sustainable regimes for biodiversity protection, conservation and utilization, and enhance regional and international cooperation in building capacity to address the management of Invasive Alien Species.	
National Agriculture Policy (2013)	National Agriculture Policy (2013) insists on the provision of support for any:  (a) Initiatives that aim at addressing agrobiodiversity deterioration; (b) Protection in a sustainable way such that, the productivity potential of crop germ-plasm and related biodiversity in the existing agroecosystem is not endangered by the introduction of genetically engineered plants; (c) State general control of pest and diseases; and (d) State on strengthening surveillance system and sanitary and phyto-sanitary and plant inspectorate services.	
National Wildlife Policy (1998)	Section 3.3.3 (vii) of the National Wildlife Policy of 1998 informs on regulating the importation of exotic/alien species and re-introduction of a species known to be indigenous to the area in order to safeguard against negative effects resulting from their introduction and re-introduction into the wild.	
National Policy for Tanzania National Parks (2011)	Section 3.7.7 of the National Policy for Tanzania National Parks, 2011 prohibits introduction of new exotic species. It provides for control including eradication of exotic species wherever such species threaten/impacts on park resources or public health and when control is feasible.	

**Source:** Auditors Analysis on the Policies related to the Management of Invasive Species in the Country (2022)

## 2.2.2 Legal and Institutional Frameworks

There are different acts and guidelines that form the backbone of the legal frameworks for the management of Invasive Alien Species in Tanzania; these are:

#### I. Acts

## National Environmental Management Act No. 20 (2004)

The National Environmental Management Act No. 20 of 2004 addresses the issue of invasive species in the sense that; it insists on conservation of biodiversity. Section 67 (2) (h) informs on the prevention and eradication of alien species that threatens ecosystem, whereas section 229 (1) (d) informs on the preparation of guidelines for addressing natural disasters such as floods, droughts and major pest infestations or other intrusions of alien species of fauna and flora.

## Animal Disease Act (2003)

The Animal Disease Act of 2003 prohibits movement of animals or animal products or animal wastes from outside of the country or introduce animals into any area without a permit. Furthermore, the Act insists on control over migrating herds at obligatory border post and internal check points by carrying out veterinary inspection.

This act gives power to the responsible minister(s) to make regulations relating to the introduction and spread of exotic and natural bee diseases.

## Tanzania Agricultural Research Institute Act (2016)

This Act provides for mandated to conduct research in agricultural sector. 3<sup>rd</sup> Schedule (a-d) directs that, research should focus on: - Integrated Pest Management; Weeds and invasive species management and any other emerging issues.

## Plant Protection Act (1997)

This act gives mandate to the responsible minister to make rules for the purposes of preventing and controlling attacks by or the spread of harmful organisms or diseases in Tanzania.

Section 8.2 of this Act provides for identification of any plant or plant product, harmful organism, beneficial organism, or soil imported into the country. Furthermore, section 13 subject to sub-section 2 of this section directs that, anything imported contrary to this Act shall be seized by an inspector, and, at the importer's expense, be treated, destroyed; or may be taken to a post-entry quarantine station for such further inspection, treatment and disposal as may be required.

## Wildlife Conservation Act (2009)

This Act insists on preparation of Environmental Impact Assessment (EIA). The EIA shall provide a statement of the existing or anticipated economic impacts to the conservation of wildlife, including an account of the species, communities and habitats affected and the extent to which they are or may be threatened.

## National Parks Act (2003)

Section 29 (4) of the National Parks Act, 2003 addresses the General penalty following introduction of vegetation in the National Parks. The Act further suggest that, introduced vegetation should be destroyed or dealt with accordingly.

## II. Regulations

## The Environmental Impact Assessment and Audit Regulations (2005)

Regulation (1) (v. vi. vii) of the Environmental Impact Assessment and Regulation 13 (1) of the Plant Protection Regulations, 1998 requires declaration on arrival to an inspector of any plant, plant products, soil, or plant protection substance imported into Tanzania. Furthermore, regulation 48 (1) prohibits any person to import plant or plant products except in accordance with the conditions on a plant importation permit previously obtained from and signed by the Inspector in-charge.

## The Seeds Regulations (2007)

Regulation 33(4) of the Seeds Regulations, 2007 provides for examination and approval of any seed imported, by ensuring that its quality is been examined and approved by TOSCI or any other certification agency which is in bilateral agreement with Tanzania as regard to seed certification. In addition, Regulation 33 (5) directs that, any imported seed shall be accompanied by certificate of quality issued by a Recognized Certification Agency, phyto-sanitary certificate and shall meet Tanzanian quarantine requirements as provided in the

## Wildlife Conservation (Wildlife Management Areas) Regulation (2018)

Regulation 51 of the Wildlife Conservation (Wildlife Management Areas) Regulation, 2018 prohibits introduction or re-introduction of non-indigenous of wildlife, bees, trees or fish in wildlife management areas unless a written approval of a competent authority in accordance with written laws is obtained.

## 2.3 Goals and Objectives of the Government on the Management of Invasive Alien Species

In order to prevent or minimize impacts on wildlife habitats and biodiversity, the Government through the National Environmental Policy, 2021 has the objective to strengthen conservation of wildlife habitats and biodiversity by promoting preventive and management measures against Invasive Alien Species.

Moreover, through the
National Invasive Species
Strategic and Action Plan
(2019-2029), the
Government has the main
goal to protect
biodiversity, ecosystem
services and livelihood
assets from Invasive Alien
Species and their
negative impacts

## 2.4 Strategies and International Conventions on the Management of Invasive Alien Species

In order to ensure adequacy of conservational of regional biodiversity, the country has adopted various national and international strategies and conventions as explained below.

## 2.4.1 National Strategies

National Invasive Species Strategy and Action Plan (NISSAP) (2019 - 2029)

Under this strategy, the country is aimed at reducing negative impacts of invasive species by establishing efficient and effective legal and institution framework; communication, education and public awareness system and technologies for prevention, eradication and control of the species.

## National Biodiversity Strategy and Action Plan (2015-2020)

This is a national strategy whose focus was on conservation of biodiversity. Under this strategy, the country targeted at reviewing and enforcement of legislations that govern exploitation of aquatic and terrestrial resources. Moreover, the strategy had aimed at identification and prioritization of invasive alien species, priority species are controlled or eradicated, and measures are in place to prevent their introduction and establishment.

# National Environmental Master Plan for Strategic Interventions (2022 - 2032)

The national environmental master plan (2022-2032) mentions the issue of invasive species as one of the environmental priority areas. The plan has set some initiatives to deal with the issue of invasive species, one of the enhancements of protection of biodiversity, ecosystem services and livelihood assets from invasive species and their negative impacts.

## 2.4.2 Regional Strategies

## SADC Regional Biodiversity Strategy (2008)

To enhance and/or establish capacity and institutional mechanisms that enable Member States to collaborate in regional biodiversity conservation; and

This is an international strategy that requires the member states to ensure effective conservation of biodiversity through the following objectives.

To prevent and control the spread of Invasive Alien Species

Strategy on Urgent Actions for the Conservation of Marine and Coastal Environment, Lakes and Rivers Ecosystems and Dams, (2008)

This is a national strategy that informs on; prevention of introduction, control or eradication of alien species which threaten aquatic ecosystems and habitats in marine, coastal, lakes, rivers and dams.

The Agreement of the Conservation of African-Eurasian Migratory Water Birds (AEWA) (1999)

Under this agreement, the parties are supposed to take measures to tackle threats to migratory water birds. Moreover, the parties are supposed to conduct environmental assessment on introduction of non-native and potentially invasive species.

### 2.4.3 International Strategies

### Convention on Biological Diversity (1996)

•Under this convention an international framework on conservation of biodiversity. Article 8 (h), of the convention requires the contracting part to prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species.

## International Plant Protection Convention (1951)

•This convention provides an international tool for plant protection that includes; developing International Standards for Phyto-sanitary Measures (ISPMs) for safeguarding plant resources. The purpose of this convention is to secure common and effective action to prevent the spread and introduction of pests of plants and plant products, and to promote appropriate measures for their control.

#### Sustainable Development Goals Agenda (2030)

•Goal 15 of the SDGs 2030 insists to protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss. Sub-goal 15.8 directs to introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority species, by 2020.

## 2.5 Roles and Responsibilities of Key Actors

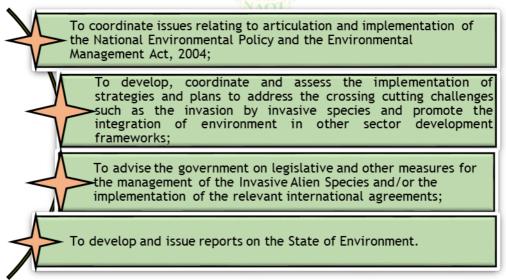
The management of Invasive Alien Species is a cooperative responsibility that involves all government and non-government actors from local to international scale. The government key actors that are directly required to ensure effective management of Invasion Alien Species in terrestrial environment are:

### 2.5.1 The Vice President's Office (Environmental Matters)

The VPO has the objective to provide overall policy guidance, coordination, expertise and services for sustainable environmental management and development in the country. The management of Invasive Alien Species at the VPO is under the Environmental Division and the Biodiversity Conservation Section.

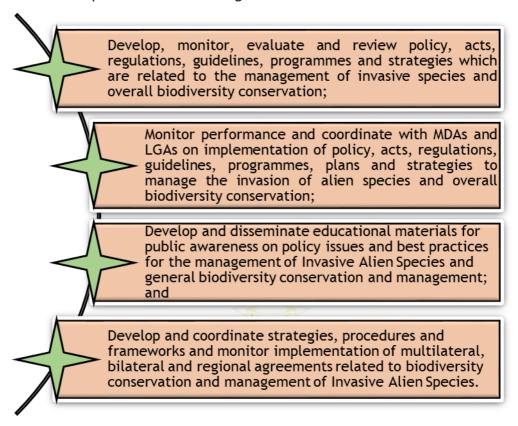
#### The Environmental Division

This section performs the following responsibilities:



## **Biodiversity Conservation Section**

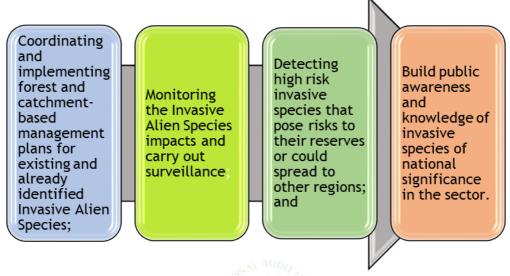
This section performs the following activities:



## 2.5.2 The Ministry of Natural Resources and Tourism

In ensuring management of Invasive Alien Species, the Ministry of Natural Resources and Tourism has the roles as indicated in **Figure 2.1** below:

Figure 2.1: Roles of the Ministry of Natural Resources and Tourism in the Management of Invasive Alien Species



## 2.5.3 The Ministry of Agriculture

The Ministry of Agriculture works to provide a legislative framework, especially biosecurity legislations, to minimize the risk pre-border and at the border of invasive Alien Species incursions, including undertaking enforcement actions and regulatory interventions.

## 2.5.4 The President's Office - Regional Administration and Local Government

The President's Office - Regional Administration and Local Governments (PO-RALG) is responsible for coordinating and monitoring the implementation of the National Environmental Policy through the Regional Secretariats and the Local Government Authorities. The Regional Secretariats (RSs) and Local Government Authorities (LGAs) have the following roles and responsibilities summarized in **Figure 2.2** below:

Figure 2.2: Roles of the President's Office - Regional Administration and Local Government in the Management of Invasive Alien Species

Lead and coordinate emergency responses to priority Invasive Alien Species incursions and eradication;

Contain an established invasive species;

Undertake enforcement actions and regulatory interventions with respect to individual landholders to support sustained management of widely established invasive species; and

Support the activities of local groups undertaking the management of Invasive Alien Species.

**Source:** PO-RALG Organizational Structure

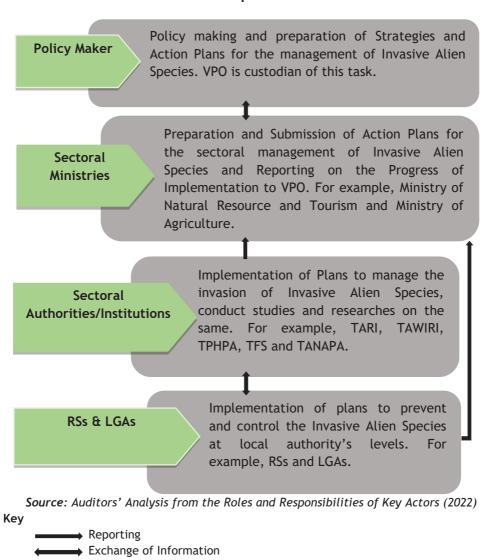
#### 2.5.5 Sectoral Authorities/Institutions

The sectoral authorities/institutions such as TAWIRI, TALIRI, NCAA and TFS have the role to implement policies and strategies related to the management of Invasive Alien Species. This is through conducting researches, survey studies and share information with the Government, Vice President's Office - Division of Environment, Ministry of Agriculture, Ministry of the Natural Resource and Tourism, President's Office - Regional Administration and Local Government, Regional Secretariats and Local Government Authorities and the general public for sustainable management of Invasive Alien Species in Tanzania.

## 2.6 Relationship between Key Stakeholders

The functional relationship between stakeholders involved in the Management of Invasive Alien Species in Terrestrial Environment is presented in Figure 2.3.

Figure 2.3: Relationship among Key Actors in the Management of Invasive Alien Species in Tanzania



Referring to **Figure 2.1**, there is a close inter-relationship and flow of information as indicated by the arrows in the figure. The Ministries have the role to manage the Invasive Alien Species by formulating adequate policy, acts, regulations, strategies and guidelines. The Sectoral Authorities/Institutions are there to make effective implementation of the laid down policy, acts, regulations, strategies and guidelines. Moreover, the Regional Secretariats (RSs) and the Local Government Authorities (LGAs) are responsible to undertake management of Invasive Alien Species at their specific areas.

## 2.7 Resources for the Management of Invasive Alien Species

The management of Invasive Alien Species is enhanced by the sufficient availability of both financial and human resources. Since the VPO is the main actor in the management of environmental issues in the country, the resources presented are specifically for the management of IASs from within the VPO. The description of the resources and their allocation is as follows:

#### 2.7.1 Financial Resources

This elaborates the funding arrangements to address the issue of Invasive Alien Species by the VPO. **Table 2.2** indicates fund allocated and disbursed from the financial year 2018/19 to 2021/22.

Table 2.2: Allocated Fund to Manage Invasive Alien Species at the VPO

Item	Financial Year			
iteili	2018/19	2019/20	2020/21	2021/22
Indicative Budget (TZS Million)	-	1,040	1,095	700
Disbursed (TZS Million)	-	-	-	-

**Source**: National Invasive Species Strategic and Action Plan (2019 to 2029)

Analysis from **Table 2.2** indicates that in the financial year 2018/19 there was no budget that was set aside to address the issue of Invasive Alien Species by the VPO. However, from the financial years 2019/20 to 2021/22 the budget was set aside but there was no any amount of fund that was

disbursed. Less priority to management of the invasive species was the reasons for non - disbursement of budgeted funds.

### 2.7.2 Human Resources

The management of Invasive Alien Species by the VPO is conducted through the Division of Environment. The Division has a total number of 39 staff to facilitate the management of Invasive Alien Species at the VPO. The distribution of staff in the Division of Environment is indicated in Table 2.3.

Table 2.3: Human Resource for the Management of Invasive Alien Species at the VPO

DESIGNATION	Required Number	Available Number	Deficit
Director of Environment	1	1	0
Assistant Directors	ANL ASIDIT	3	0
Environmental Officers	18	10	8
Town Planners	5	4	1
Fisheries Officers	3	2	1
Livestock Officers	NAOT	1	0
Engineers	7	4	3
Agricultural Officers	2	2	0
Economists	2	2	0
Forest Officers	5	4	1
Game Officers	1	1	0
Community Development Officers	2	1	1
Teachers	6	4	2
Total	56	39	17

**Source**: Ikama of the Office of the Vice President - Environment Department (2022)

From **Table 2.2**, it has been indicated that, the Division of Environment lacks 17 staff, 8 of the staff that are required are the environmental officers. This implies that the environmental officers accounted for more than 50 percent of the total number of staff deficit in the Directorate.

## 2.8 Process for the Management of Invasive Alien Species in the Country

The Invasive Alien Species can be managed by either preventive approach or control approach depending on the stage of invasion by invasive species. The preventive approach is normally applied during introduction stage of the invasive species while the control approach is used when the invasive species has established, reproduced and spread over the invaded area. **Figure 2.4** indicates the summarized process for the management of invasive species.



Management of Invasive Alien **Species** Control Approach Preventive Approach 1. Development 1. Identification Invasive Alien Priority Pathways of **Species Database** Invasive Alien Species 2. Development and 2. Risk Assessment of the Implementation Potential Invasive Alien **EDRR Procedures for Species** Control of Invasive 3. Capacitation of Border Alien Species **Posts** 3. Capacity Building 4. Enforcement 4. Enforcement of Strategies to set Strategies set to prevent the Invasive Control the Invasive Species Alien Species M&E of the Management Approaches

Figure 2.4: Summarized Process of the Management of Invasive Alien Species

**Source:** Auditors' Analysis of the Information from the NISSAP (2019-2029)

## 2.8.1 Preventive Approach

This is the preliminary approach used to avoid the arrival, entry and spread of the Invasive Alien Species. It works against intentional or unintentional introductions, involving measures such as border controls, quarantine, ballast water treatment, and so forth. Preventive approach of management of invasive species is far cheaper and environmentally friendly approach compared to control approach.

The preventive approach consists of the following processes:

## (i) Identification of Priority Pathways Vectors of Introduction of Invasive Alien Species

The VPO and all responsible key actors works to analyse the pathways and vector of introduction and spread of invasive species. This analysis is important in order to provide information that will guide the choice of appropriate prevention method. It involves a close cooperation between the national and international agencies to ensure that mandatory inspections for vectors such as movement of animals, all-terrain vehicles, boats, ballast water and other modes of transportation of invasive species are adhered based on existing local and international legal frameworks.

## (ii) Risk Assessment of the Invasive Alien Species

The VPO and all key actors in preventing the invasion of invasive species should develop early warning system in order to help determine which invasive species are most likely to intrude, establish and spread in Tanzania. This should be done by conducting risk assessment which must consider types of invasive species, pathways of introduction and vectors of spread.

## (iii) Capacitation of Entry Points

In order to improve and make effective prevention of entrance of invasive species, the VPO and key actors especially the MoA and the MNRT should ensure that the entry points such as border posts are capacitated with necessary and required human resources and equipment.

# (iv) Enforcement of Strategies set to Prevent the Invasive Alien Species

The VPO and key actors are obliged to strengthen and enforce all strategies adopted to ensure effective prevention of Invasive Alien Species. This may include but not limited to enforcement of regulations

dealing with importation and movements of live materials across the entry points of the country.

## 2.8.2 Control Approach for the Management of Invasive Alien Species

Control of Invasive Alien Species is a recommended management practice when prevention is not effective. This stage increases the likelihoods that small and localised invasions are fully eradicated when controlled at early stage of invasion.

The preventive approach consists of the following processes:

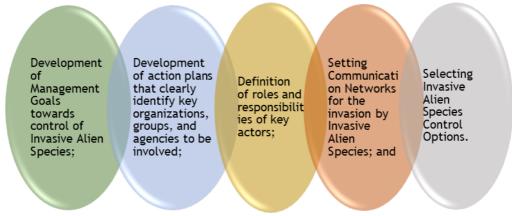
## (i) Development Invasive Alien Species Database

The VPO and Sectoral Ministries are supposed to prepare a list of potential invasive species in order to alert the public about a new invasion or new behaviour of existing invasive species for enhancing their participation in Invasive Alien Species management.

# (ii) Development and Implementation EDRR Procedures for Control of Invasive Alien Species

In order to successfully control new invasions and minimize control costs, the VPO and the Sectoral Ministries are required to develop and implement an Early Detection and Rapid Response (EDRR) of Invasive Alien Species. This should include but not limited to the following items presented in Figure 2.5.

Figure 2.5: Development and Implementation Procedures for Control of Invasive Alien Species



**Source:** Auditors' Analysis of Global Strategy on Invasive Alien Species (2000)

## (iii) Capacity Building

The effective management of Invasive Alien Species depends on the national capacity on management measures, financial resources, specialists in invasive species, research and monitoring human resources, technology, and infrastructure. The VPO and Sectoral Ministries are, therefore, required to ensure adequate investments in the national capacity on control measures in order to reduce the negative impacts and increase efficiency and effectiveness of the management of Invasive Alien Species in the country.

# (iv) Enforcement of Strategies set to Control the Invasive Alien Species

The VPO and key actors are obliged to strengthen and enforce all strategies adopted to ensure effective control of Invasive Alien Species.

## 2.8.3 Monitoring and Evaluation of the Invasive Alien Species Management Approaches

This involves a regular check-up of the functionality of both preventive and control measures in place. This will assist to evaluate the effectiveness and efficiency of such measures and to ensure achievement of the anticipated goals to manage the Invasive Alien Species. Under this stage, the VPO and the Sectoral Ministries are required to undertake activities summarized in **Figure 2.6** below:

Reporting of the Performance of the IAS management Measures

Reporting of the Performance of the IAS management Measures

Figure 2.6: Monitoring and Evaluation Activities of the Invasive Alien Species

#### CHAPTER THREE

## FINDINGS ON THE EXTENT OF INVASION BY INVASIVE ALIEN SPECIES IN THE COUNTRY

### 3.1 Introduction

This chapter explains the prevailing situation regarding the Invasive Alien Species in the country. It describes the commonly available types of Invasive Alien Species (IASs) in the country as well as their level of invasion especially in terrestrial environment. Furthermore, the chapter narrates on the actions taken by the Government in the management of Invasive Alien Species.

## 3.2 Existence of Invasive Alien Species in the Country

There is no exhaustive information on the list of invasive species in Tanzania. This is attributed to insufficient research on these species by the responsible entities such as the research and academic institutions. However, the analyses by the Audit Team from the information presented in the National Invasive Species Strategy and Action Plan (NISSAP 2019-2029) indicate that, Tanzania has a total of 220 identified invasive species, 92% of these species are Invasive Alien Species while 8% are Invasive Native Species.

The identified Invasive Alien Species fall under three main groups (kingdoms) of living organisms namely plantae, animalia and fungi kingdoms. **Figure 3.1** indicates the number of identified Invasive Alien Species based on their groups.

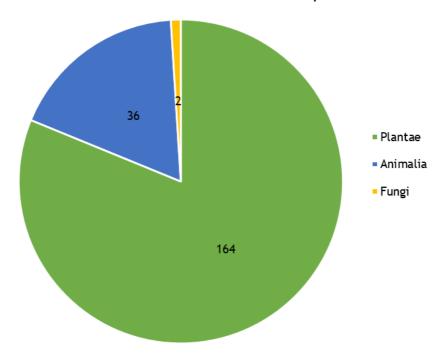


Figure 3.1: Number of Identified Invasive Alien Species in the Country

**Source:** Auditors' Analysis of Information presented in the NISSAP (2019-2029)

From Figure 3.1, it can be noted that, 81% of the identified Invasive Alien Species in the country belong to the plantae group of living organism. This implies that the country is largely invaded by plants compared to other groups of living organisms.

Moreover, review of NISSAP 2019-2029 noted that, the Invasive Alien Species are available in almost all sectors of economy. **Figure 3.2** presents the number of commonly found Invasive Alien Species in the most invaded sectors of economy as presented in the NISSAP (2019-2029).

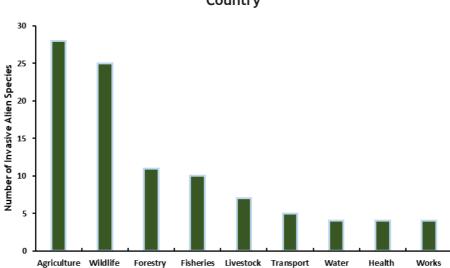


Figure 3.2: Number of Commonly Found Invasive Alien Species in the Country

**Source:** Auditors' Analysis of the Information from the NISSAP (2019-2029)

Invaded Sector

**Figure 3.2** indicates that, 65% of the identified potential and priority Invasive Alien Species in the country are found in Agriculture, Wildlife, and Forestry sectors of economy. This indicates that, these sectors are at higher risk of being affected by the Invasive Alien Species than other sectors of economy.

Furthermore, the review of the report on Distribution of Ten Priority Invasive Species in Tanzania published by Bukombe and Mrosso(2019), noted the invasive species are scattered across almost all over the country. Based on this report, the commonly found Invasive species are fall army worms, carrot weeds, gutebergia, Indian house crow, kongwa weeds, prosopis, rubber brush, siam weed, tomato leaf miner and water hyacinth. Figure 3.3 shows the distribution of these species in the respective regions.

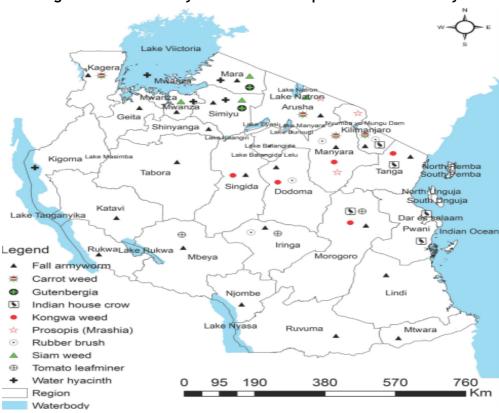


Figure 3.3: Commonly Found Invasive Species in the Country

**Source:** Report on Distribution of Ten Priority Invasive Species in Tanzania by Bukombe and Mrosso (2019)

**Figure 3.3** indicates that the *fall armyworm* is found almost in every region of Tanzania. The *Kongwa weed* is found in Dodoma, Morogoro, Tanga, Manyara, and Singida regions. Furthermore, the *tomato leaf miner* is common in Rukwa, Mbeya, Iringa and Morogoro regions. The *Indian house crow* is commonly found in Dar es Salaam, Pwani, Tanga, Morogoro and Kilimanjaro regions. The *carrot weed* has invaded mostly in Arusha, Manyara and Kilimanjaro regions. The **Photos** below show the commonly found Invasive Alien Species in the country.



**Photo 3.1:** Fall armyworm, photo by A.S. Botha; H. du Plessis, 2020



**Photo 3.2:** Indian House Crow, the photo by Andrea Teagle, 2018



**Photo 3.3:** Chromolaena odorata as observed in Ngorongoro Conservation Area, the photo was taken by the Auditors, June, 2022



**Photo 3.4:** Gutenbergia cordifolia as observed in Ngorongoro Conservation Area, the photo was taken by the Auditors as of June, 2022





in Kongwa Ranch, the photo was taken by the Auditors as of June, 2022

Photo 3.5: Kongwa Weeds as observed Photo 3.6: Tomatoes Invaded by Tomato Leaf miner, photo by Tropical Pesticides Research Institute, 2016

#### 3.3 Extent of Invasion by Alien Species in Terrestrial Environment

The Audit found that, the invasive species invaded potential areas allocated for Agriculture, Wildlife and Forestry sectors of economy as discussed below.

Review of a report on the Extent and Severity of Invasive Alien Species in National Parks by TANAPA, 2022, revealed that, the National Parks are invaded by 70 different types of invasive plants covering an estimated area of 541.94 km<sup>2</sup> that is equivalent to 0.52 % of the total area coverage of all National Parks in the country. Table 3.1 shows the extent of invasion by invasive species in some of the National Parks.

Table 3.1: Identified Invasive Alien Species in the National Parks

Name of the Area Invaded	Total Area (Km²)	Area Invaded (Km²)	Percentage Invasion (%)
Ngorongoro Conservation Area-Crater	260	57.2	22
Kitulo National Park	413	150	36
Saanane National Park	3	1	33
Arusha National Park	552	55	10
Rubondo National Park	457	32	7

**Source:** Report on the Extent and Severity of Invasive Alien Species in National Parks by TANAPA (2022)

**Table 3.1** portrays that the National Parks are invaded by the invasive species. Kitulo National Park was observed to be highly invaded, whereby 36% of its area has been covered by the Invasive Alien Species. This was caused by the absence of effective measures to manage the Invasive Alien Species in the National Parks.

Moreover, through the review of the implementation reports on Annual Invasion Report for the financial year 2018/19 to 2021/22 in Mvomero DC, and interviews held with officials from Mvomero DC, revealed that, the council was experiencing the invasion by Invasive Alien Species in every season of agriculture. The Invasive Alien Species such as *fall armyworms* had been affecting maize plantations in every season. **Table 3.2** indicates the extent of invasion by these species in Mvomero DC from the financial year 2018/19 to 2021/22.

Table 3.2: Extent of Invasion in the Agriculture Sector-Myomero DC

•				
Financial	Total Area Planted	Total Area Invaded	Invasion	
Year	(Ha)	(Ha)	(%)	
2018/19	23,763	7,940	33	
2019/20	19,356	12,088	62	
2020/21	35,331	9,703	27	
2021/22	41,294	7,340	18	

**Source**: Auditors' Analysis of the Information from the Annual Invasion Report 2018/19 to 2021/22-Mvomero DC

**Table 3.2** shows that the highest level of invasion in Mvomero DC was observed in the financial year 2019/20, whereas the lowest level of invasion was observed in the financial year 2012/22. However, the general trend of invasion indicates that, the level of invasion increased from the financial year 2018/19 to 2019/20, whereas in the financial years 2020/21 and 2021/22 the level of invasion was noted to decrease due to Government interventions including the use of chemicals to control the Invasive Alien Species.

In addition, interviews held with officials from TFS revealed that, the forestry is currently invaded by different types of invasive species especially the *Lantana camara* species. Review of the Natural Forest Management Plans from four forest reserves, shows that the forestry sector was invaded by the Invasive Alien Species. **Table 3.3** gives the status of invasion in this sector of economy.

Table 3.3: Extent of Invasion by Alien Species in the Forestry Sector

Name of the Area Invaded	Total Area (Km²)	Area Invaded (Km²)	Percentage Invaded (%)
Kimboza Catchment Forest Reserve	4.05	0.61	15
Chome Nature Forest Reserve	142.83	2.10	2
Amani Nature Forest Reserve	3.40	0.20	6
Mount Rungwe Nature Forest Reserve	136.52	18.43	14

**Source**: Auditors' Analysis from the Natural Forest Management Plans

From **Table 3.3**, the levels of invasion at Kimboza Catchment Forest Reserve and Mount Rungwe Nature Forest Reserves were found to be greater as compared to other forest reserves.

# 3.4 Action(s) taken by the Government to Manage Invasive Alien Species

The issue of management of Invasive Alien Species was initially implemented individually by the responsible Sectoral Ministries particularly the MNRT, MoA, and PORALG. Thereafter, the VPO in the National Biodiversity Strategy and Action Plan (2015-2020) targeted at identification and prioritization of Invasive Alien Species, control or eradication of priority Invasive Alien Species and establishing measures to prevent the introduction, spread and establishment of Invasive Alien Species.

This National Biodiversity Strategy and Action Plan did not cover the issue of Invasive Alien Species to a great extent. This was due to the fact that, the strategy did not identify the measures to control the introduction, spread and impacts of the Invasive Alien Species in the country. Therefore, the Government through the VPO decided to formulate a tenyear National Invasive Species Strategy and Action Plan (NISSAP) which was published in June 2019.

Under the NISSAP, the country aimed at reducing negative impacts of invasive species by establishing efficient and effective legal and institutional framework; communication, education and public awareness system and technologies for prevention, eradication and control of the species. Moreover, this strategy is to be used as the guiding tool in setting plans and goals to manage the Invasive Alien Species by either Sectoral Ministries, Sectoral Institutions, or Local Government Authorities.

However, it was found that, the plans and targets presented in the NISSAP (2019-2029) were not implemented by either the VPO or the responsible key actors due to inadequate prioritization of the management of Invasive Alien Species during planning and budgeting. Review of the progress reports from the VPO, revealed that the plans and targets set by VPO to control the abundance and spread of the Invasive Alien Species were not implemented at all as indicated in **Table 3.4**. Since the publication of the NISSAP in 2019, there was no any report to address the progress of the

intended plans and targets of control of Invasive Alien Species in the country.

Table 3.4: Status of the Implementation of Plans to Manage the Invasive Alien Species in the Country

Target	Implementation	Remarks
At least 90% of all biological materials introduced to are inspected against Invasive Species threats by 2024	Partially Implemented. This was reflected by inadequate inspection of all biological materials introduced through the ports of entry	There were no collaborative plans between VPO and sectoral Ministries to address this target.
At least 95% of emerging invasive species are detected and eradicated by 2029	Partially Implemented. This resulted from inadequate measures to detect and eradicate emerging invasive species	Absence of accepted methods for detection and eradication of IASs in the country.
The abundance and spread of all national priority invasive species are reduced by at least 50% by 2029	Not Implemented there were no any implementation strategies to address this target	There were no measures taken to address this target
At least 50% of critical ecosystems impacted by invasive species are restored by 2029	Not Implemented, this was due to the absence of measures to restore the impacted areas	Absence of measures adopted by VPO and other key actors to restore impacted ecosystem
At least 50% invasive species management efforts are monitored and evaluated by 2029	Not Implemented. This was evidenced by lack of reports to address the plans on monitoring and evaluation of activities to manage the Invasive Alien Species in the country	Absence of monitoring and evaluation reports to address the invasive species management efforts
At least 70% of funds proposed for management of	Not Implemented. This was due to	Absence of allocation and disbursement of

Target	Implementation Status in 2022	Remarks
invasive species is secured and implemented by 2024	absence of fund that was disbursed to cater for the activities related to the management of Invasive Aline Species in the country	fund by VPO to specifically deal with IASs
By 2025, research on invasive species increased by 50%	Not Implemented. Since the establishment of NISSAP in 2019, there was no any research that was conducted as per plans adopted in it (the NISSAP)	There were not any initiatives to address this target

**Source:** Auditors Analysis of Information Extracted from the NISSAP (2019-2029)

**Table 3.4** shows that, none of the targets to control invasive alien species was fully implemented despite the fact that the NISSAP was prepared and published in 2019.

The plans and targets presented in the NISSAP (2019-2029) were not implemented by either the VPO or the responsible key actors due to absence of measures to enforce the implementation of the plans in the NISSAP. Furthermore, interviews held with officials from VPO revealed that, the plans in the NISSAP were hardly implemented due to inadequate inter sectoral collaboration and coordination, and inadequate financial and technical capacity to manage invasive species.

Inadequate implementation of the National Invasive Species Strategy and Action Plan increases the risk of new introductions, spread and increased impacts of the IASs, thus reduced environmental sustainability for the present and future generations.

#### **CHAPTER FOUR**

### FINDINGS ON THE PREVENTIVE MEASURES FOR THE INVASIVE ALIEN SPECIES

#### 4.1 Introduction

This chapter explains the manner that the VPO and the Sectorial Ministries used as the prevention approach for the first line of defence against the Invasive Alien Species. The Audit noted the following:

# 4.2 VPO did not coordinate the Identification and Management of the Priority Pathways and Vectors of the Invasive Alien Species

Objective 1, Action 1.1.1 of the National Invasive Species Strategy and Action Plan (NISSAP) (2019 - 2029) directs the VPO, Sectorial Ministries, Research and Academic Institutions to set targets for identification and management of priority pathways and vectors of invasive species introduction and spread.

Review of the Performance Reports and Research Reports from the Ministry of Agriculture and Ministry of Mineral Resource and Tourism noted that, up to time of this audit, VPO and the Sectoral Ministries did not conduct analysis of pathways that affected their sectors for managing invasive species.

According to the review of the research reports, this situation was caused by the inadequate researches conducted by Higher Learning Institutions, Research and Development Institutes such as TAWIRI, TARI, TPHPA and TAFORI on areas of the priority pathways. The research on areas of the priority pathways expands knowledge base and the latest information on whether Alien Species invaded through pathway like release, escape, transport contaminant, transport stowaway, corridors and/or unaided. Overreliance on the Global Invasive Species Database<sup>11</sup> and inadequate

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<sup>&</sup>lt;sup>11</sup> The Invasive Species Specialist Group (ISSG-IUCN) (2018).

budgets of the said research institutes have hindered provision of information that would guide on the choice of appropriate intervention approaches against the Invasive Alien Species through identified pathway. It would, moreover, hamper the identification of sectoral linkages among pathways, and thus impede designing of feasible strategies for the management of invasive species.

## 4.3 Inadequate Prevention of the Invasive Alien Species at the International Borders (Ports of Entry)

Section 8(2) Plant Protection Act, 1997 points out that, plant or plant product, harmful organism, beneficial organism, or soil imported in Tanzania, shall be clearly identified, declared to an inspector and be made available for an inspection or any subsequent action.

Based on the review of the inspection reports (2018/19-2021/22) from the ports of entry, it was noted that, Ministry of Agriculture through Tanzania Plant Health and Pesticides Authority did not manage to inspect intentionally or unintentionally introduction of the Invasive Alien Species through the ports of entry.

The factors which contributed to inadequate prevention of Invasive Alien Species at the International Borders (ports of entry) are described hereunder;

#### 4.3.1 Nine Ports of Entry did not have Inspectors

The Audit Team visited borders and found that TPHPA did not have inspectors at nine (9) ports of entry contrary to Section 12(1) of the Plant Protection Regulations of 1998. The analysis of ports of entry without inspections is as shown in **Table 4.1** and its details presented in **Appendix 6.** 

Table 4.1: Allocation of Inspectors at the Ports of Entry

Category of ports of entry	Total Number of Inspectors Required	Number of Inspectors Allocated	Percentage deficiency (%)
Airports	5	5	0
Harbours	10	7	30
Borders	25	19	24
Total	40	31	22.5

**Source:** Auditor's Analysis of Information from the Ports of Entry in Tanzania (2022)

**Table 4.1** indicates that, nine (9) out of forty (40) ports of entry, equivalent to 22.5%, were observed to be operating without inspectors. It also shows that, all the airports had inspectors, and that 30% of the harbours and 24% border posts lacked inspectors at the ports of entry.

Based on the interviews held with officials from the ports of entry, it was noted that, 22.5% of the ports of entry did not have inspectors due to the fact that, some ports of entry were too small to allocate an inspector. However, TPHPA was not able to hire enough inspectors due to the lack of budget. As a results, this led to potential loopholes for introduction of Invasive Alien Species in the country.

# 4.3.2 Inadequate Number of Human Resources to Serve at the Ports of Entry

Visits made at Border posts revealed that there was a gap between the needed number of officials and those available. The information on staffing level at each visited Border posts that were responsible for inspection to prevent and control introduction of invasive species in the country is presented in **Table 4.2**.

Table 4.2: Human Resources on the Visited Border of Entry

Border	Number of Staff Required	Number of staff Available	Deficiency
Silali	6	3	3
KIA	10	6	4
Kasumulo	6	4	2
Namanga	7	5	2

**Source:** The Ministry of Agriculture's Staffing Level (2021/22)

The analysis of staffing levels as shown in **Table 4.2** shows the gap between the needed number of officials and those available with a range of 2 to 4 staff. Through the interviews held with officials from the ports of entry, it was noted that, there were few inspectors due to the fact that there has been no new recruitment to meet the demand. However, the Ministry of Agriculture through TPHPA did not make any initiatives to ensure adequate number of personnel at the ports of entry.

The lack or absence of inspectors leads to inadequate prevention over the entrance of invasive species through the ports of entries. Furthermore, it was noted that none of the staff possessed an inspection identity card, which would have allowed people to easily identify them as inspectors. This is contrary to the Plant Protection Act of 1997, which requires inspectors to have an inspection identity card.

### 4.3.3 Incompleteness of the Inspection of the Imported Plant Products

The Audit acknowledges that, the inspectors at the ports of entry checked documents accompanying imported consignments of fresh fruits, vegetables or flowers (phyto-sanitary certificates, plant import permit, airway bills, bill of lading and invoices). However, the Audit did not find evidence to ascertain whether physical inspection of those imported plant products was done. Furthermore, through interviews with TPHPA officials, it was found that no inspection checklists or inspection reports existed for guiding and recording inspection activities. The official confirmed that the inspections were being done and the update was verbally communicated but the records of the conducted inspection were not documented in physical inspection reports.

However, the audit noted that such approach was contrary to the subsection 3 of the Standard Operating Procedures for phyto-sanitary operations of 2009; the sub-section pertained with the inspection of fresh fruits, vegetables and flowers revealed that, authorized plant quarantine inspector to conduct inspection of declared plant materials, to record inspection results and to present records of the result of inspection to the

inspector in charge. Therefore, lack of development of the inspection reports was merely due to negligence and lack of enforcement to ensure procedures were followed. TPHPA's negligence was also evident in the absence of any strategy in place to ensure the effective conduct of physical inspections.

# 4.3.4 Inadequate Number of Equipment for Inspection at Border of Entries

The Audit Team found out that, the officers at Ports of Entry of Namanga, Sirari, Kasumulo and KIA were inadequately supplied with the needed working tools such as spatulas, alcohol and sampling jars, kilner jars, bags, petri dishes, trays, as well as mask pertinent/specific to fumigants, example methyl bromide, aluminium phosphide and magnesium phosphate.

Due to equipment requirements as shown in the Standard Operating Procedures for Phyto-sanitary Operations Plant Health Services of April, 2009, the Audit Team did the analysis as shown in **Table 4.3** based on the total number of equipment needed versus the actual number of the equipment. Additionally, the detailed results of the available equipment at the visited ports of entry are shown in *Appendix 7*.

Table 4.3: Availability of Equipment at the Visited Ports of Entry

Category of	Required	Actual Number			
Equipment	Number of the equipment	Sirari	KIA	Namanga	Kasumulo
Protective gears	5	5	0	0	-
Laboratory tools	20	13	10	9	-

**Source:** Auditor's Analysis on the number of the available equipment at the Ports of Entry (2022)

As shown in **Table 4.3**, only the Sirari border had five (5) protective gears. In terms of laboratory tools, all ports of entry had operational laboratory

tools, with a deficit of seven (7), ten (10), and eleven (11) for the Sirari, KIA, and Namanga ports of entry, respectively.

The laboratory tools were necessary to assist on phyto-sanitary observations, research, inspection, testing and treatment of the imported plants, plants products to assess whether the goods imported were free from infectious and invasive species before they are imported. Nonetheless, the Audit Team found that, in comparison to other ports of entry, only the Sirari border had laboratory tools for examination or diagnostics of imported consignments.

According to an interview with TPHPA staff, the factor contributing to the lack of inspection equipment at ports of entry was a lack of funding from the Government. The Government did not provide funds to facilitate procurement of inspection equipment at ports of entry, therefore TPHPA relied on funds obtained through their own collections for services rendered, however this amount was not sufficient to procure enough equipment for the Ports of Entry and carry out other activities. TPHPA failed to provide proof that it had asked the Government for money to support the purchase of equipment when the Audit Team asked for it during the audit. As a result, a lack of equipment at the ports of entry made it impossible for inspectors to carry out their routine inspection duties in order to prevent the introduction of invasive species into the country.

### 4.4 Inadequate Prevention of the Entrance Barrier at the Protected Areas and National Parks

Section 110 (3) of the Wildlife Conservation Act, 2009 stipulates that, a person required to stop or a person on board of the vehicle, vessel, or aircraft shall allow the authorised officer to carry out inspection as may be necessary to ensure that an offence has not been committed or is about to be committed.

Following a review of the NCAA and Serengeti National Park inspection reports, it was discovered that there were insufficient prevention measures, such as inspection of biological materials introduced into the country against Invasive Alien Species threats, as well as detection and eradication of Invasive Alien Species, for restricting the introduction of Invasive Alien Species, either intentionally or unintentionally, through entrance gates. The protected areas and national parks' entrances were supposed to have intensive inspections for any goods entering the protected areas and national parks.

Based on the reviewed presentation report from TANAPA of February, 2019<sup>12</sup>, the Audit Team noted that, factors that, contributed to inadequate inspection at entrance gates to the National Park were:

(i) Inadequate resources (funds, expertise, machinery) to deal with the prevention of Invasive Alien Species effectively and efficiently. Based on the inadequacy of the fund, the Audit Team made analysis of the availed TANAPA budgeted amount versus the disbursed amount as shown in Table 4.4.

Table 4.4: Budgeted Amount versus Disbursed Amount for Prevention of Invasive Alien Species by TANAPA

Financial Year	Budget Amount (TZS)	Disbursed Amount (TZS)	Deficit (TZS)
2019/20	715,935,727.93	571,352,089.91	144,583,638.02
2020/21	432,084,919.52	115,598,744.81	316,486,174.71
2021/22	664,862,104.00	419,456,626.04	245,405,477.96

**Source:** MTEF submitted by TANAPA 2019/20-2021/22

**Table 4.4** shows the inadequate disbursement of fund from the financial year 2019/20 to 2021/22. The noted deficits were TZS 144,583,638.02, 316,486,174.71 and 245,405,477.96 respectively, and the maximum deficit was TZS 316,486,174.71 which was noted in the financial year 2020/21.

<sup>&</sup>lt;sup>12</sup> Invasive alien organisms reported on February, 2019

- (ii) During an interview with TANAPA staff, it was found that TANAPA during peak time employ temporary workers to cut down, spray, or uproot any Invasive Alien Species in their parks. This work is mainly manually done because TANAPA has not enough machines for the prevention and control of Invasive Alien Species. However, no evidence was provided to the Audit Team to demonstrate the need for the required number of machines in order to bridge the gap between the required and existing equipment; and
- (iii) Lack of common understanding and strategy between the national parks and their respective adjacent communities on dealing with invasive species.

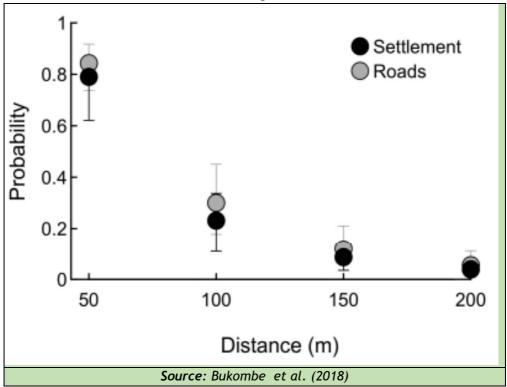
The Audit Team noted that, lack of proper prevention measure at the entrance gates of the protected areas and the National Parks might accelerate the spread of invasive species and hence may lead to significant cost for controlling them in the protected areas and the National Parks.

# 4.5 Inadequate Implementation of the Procedures for Early Detection and Rapid Responses (EDRR)

Objective 1, Action 1.2.1 of the National Invasive Species Strategy and Action Plan (NISSAP) (2019 - 2029) requires the VPO and the Sectoral Ministries to develop and implement Early Detection and Rapid Response (EDRR) procedures for invasive species management.

Research done by Bukombe *et al.* (2018) in the Serengeti National Park showed that, Invasive Alien Species are more likely to be found closer to roads and settlements. Thus, these are areas where early detection could be possible, which could give a better opportunity for rapid response. The research results conducted at the Serengeti National Park are shown in **Figure 4.1** and **Figure 4.2**.





**Figure 4.1** Indicates that, probability of finding alien plant species in the Serengeti National Park is higher near roads and settlements and declines as you move away from roads.

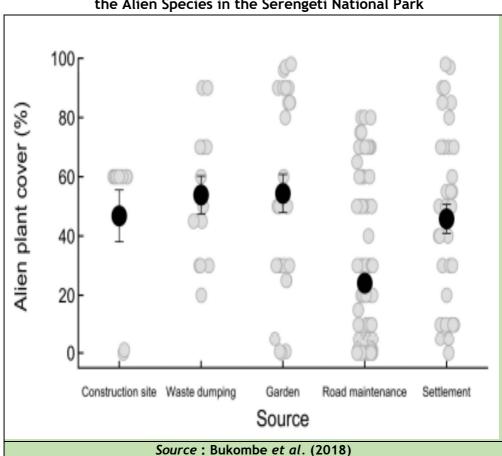


Figure 4.2: Relationship of the Human Activities (source) to Invasion of the Alien Species in the Serengeti National Park

**Figure 4.2** presents the percentage coverage of Invasive Alien Species in relation to human activities in the Serengeti National Park. All surveyed quadrants are shown in light grey symbol and average source cover is shown in black symbol. From the findings in **Figure 4.2**, settlements were found to be highly invaded by the Invasive Alien Species.

Furthermore, a site visit to the Serengeti National Park and roadside areas in Karatu District revealed the existence of invasive species along the roads as shown in **Photos 4.1 and 4.2**. However, there were no indications of a comprehensive response, such as early detection and rapid response.





**Photos 4.1 and 4.2:** Invasive Alien Species along the roadside areas observed by the Audit Team during Physical Observation on 12th June & 10th September 2022

The challenge in areas where early detection was possible was a lack of a developed national surveillance system of the Invasive Alien Species, which ran counter to objective 1, Action 1.2.2: of the National Invasive Species Strategy and Action Plan (NISSAP) (2019 - 2029), which required sectorial Ministries to develop and implement a national surveillance system for IS management by 2021. As a result, this accelerated the introduction and establishment of the alien species.

# 4.6 VPO and the Ministry of Agriculture did not manage to conduct Risk and Environmental Impact Assessment of Potential Invasive Alien Species

Objective 1.1.2 of the National Invasive Species Strategy and Action Plan (NISSAP) (2019 - 2029) requires the VPO and Ministry of Agriculture to conduct risk and environmental assessment of potential Invasive Alien Species. In addition, Section 1 (v, vi, vii) of the Environmental Impact Assessment and Audit Regulations (2005), informs on EIA undertaking for the projects that involves: Biological Pest Control; Introduction of new

breeds of crops; and Introduction of Genetically Modified Organisms (GMOs) Projects.

Review of the implementation reports from VPO and Ministry of Agriculture for the period from 2018 to 2022 revealed that, there was no effort to conduct risk and environmental impact assessment of potential Invasive Alien Species through the projects implemented in Tanzania under foreign experts and imported materials or equipment which were not subjected to proper assessment of introduction of the potential Invasive Alien Species in the country.

This was contributed by lack of risk implementation strategy or action plan in place. The existence of an implementation strategy would guide the provision instructions on how the risk and environmental strategy should be done, how much budget and the number of experts who will be involved in ensuring how invasive species are encountered before they enter in country through foreign experts, materials and or equipment.

The VPO, as the custodian of the environment, developed the National Invasive Species Strategy and Action Plan (NISSAP) (2019-2029), but did not further develop the implementation strategy. Furthermore, the Ministry of Agriculture staff interviewed confirmed that the VPO did not give instructions to prepare an implementation strategy. Through interviews with VPO staff, it was discovered that a lack of priority was a contributing factor to the lack of a risk and environmental impact assessment strategy for potential invasive alien species.

Consequently, the VPO and Ministry of Agriculture were unable to predict which invasive species are most likely to enter Tanzania and establish themselves. This could have massive economic consequences as well as fundamental disruptions to terrestrial, coastal, and Great Lakes ecosystems.

#### **CHAPTER FIVE**

#### FINDINGS ON CONTROL OF INVASIVE ALIEN SPECIES

#### 5.1 Introduction

This chapter provides finding on the control system for Invasive Alien Species (IASs) in the country. It covers availability of database for IASs, development of goals and strategies to controls the IASs, capacity building campaigns as well as actions taken by the VPO and the Sectoral Ministries to ensure effective control of IASs.

#### 5.2 Absence of the National Database for Invasive Alien Species

Action 2.1.3 of the NISSAP (2019-2029) directed VPO, in collaboration with the Ministry responsible for Wildlife, Fisheries, Forestry, COSTECH, Research and Academic Institutions, Private Sectors, NGOs and CBOs, to develop and strengthen a centralized National Invasive Species Database by 2019. Such a database could be used as a forum to record and track invasive species occurrences and management efforts across the country.

According to a review of the implementation reports for the financial years 2018/19 to 2021/22, the VPO, in collaboration with the Ministry responsible for Wildlife, Fisheries, Forestry, COSTECH, Research and Academic Institutions, Private Sectors, NGOs, and CBO, did not develop the National Invasive Species Database. This database was intended to provide information on the types and prioritized Invasive Alien Species, the extent of invasion in the country, the most invaded areas in the country as well as the area that are prone to invasion by such species. The information from the database can then be used as a forum to track Invasive Alien Species occurrences. The database can also be used for sharing data and provide opportunities for identification of gaps in the management of Invasive Alien Species. Because of the lack of such a database, the country lacks up-to-date information on invasive species that have infiltrated various sectors. In most cases, information on invasive species is obtained after their introduction and noticeable spread.

In the absence of a concrete and reliable National Database for Invasive Alien Species, the country faces a high risk of effectively tracking the spread and development of Invasive Alien Species. This may cause difficulties in recording their spread and development, resulting in a lack of planning and budgeting for their management. Ineffective decision making regarding the management of invasive alien species may be hampered as a result of poor planning and budgeting.

The following are the reasons for absence of the National Database for Invasive Alien Species:

#### 5.2.1 Inadequate Research on Invasive Alien Species

Target 3.2 of the NISSAP (2019-2029) insists on increasing researches on invasive species by 50% in 2025. This is done to expand existing knowledge and incorporate the needs of stakeholders on control of invasive species based on scientific knowledge of species biology, habitats, control methods, and other aspects of their natural history.

The Vice President's Office is responsible to coordinate the researches on Invasive Alien Species that are supposed to be done by the Research and Academic Institutions, NGOs, Development Partners, LGAs, Private sectors, NGOs, CBOs, and NEMC. However, the Audit Team did not find any measures from the VPO to assure the conduction of researches by the responsible Government and non-government entities.

Based on the information presented by the NISSAP (2019-2029), it was revealed that as of 2019, there were twenty (20) research projects conducted on the management of Invasive Alien Species. Table 5.1 indicates the frequency of conduction of different aspects of the management of Invasive Alien Species.

Table 5.1: Frequency of Conduction of Researches on the Management of Invasive Alien Species

Assessed Aspect	Frequency of Conduction
Type of Species	4
Types of Pathways	1
Prevention Approaches	1
Spread of Invasive Species	11
Control Approaches	8
Impacts of Invasive Species	4
Awareness Program on Invasive Alien Species	2
Habitat of Invasive Alien Species	2

Source: Auditors' Analysis of the Conducted Research Projects on Invasive Species in the Country as Presented in the NISSAP (2019-2029)

**Table 5.1** shows that, the aspect of Spread of Invasive Species was mostly covered than other aspects, whereas the aspects of Types of Pathways and Prevention Approaches were minimally covered as compared to other aspects of the management of Invasive Alien Species.

Furthermore, action 3.2.1 of the NISSAP (2019-2029) Support research on priority invasive species whereby each research institution was required to annually conduct one (1) research on the management of Invasive Alien Species.

The review of the published researches from TAWIRI, TARI, TPHPA and TAFORI, noted that, researches on Invasive Alien Species were not conducted by the responsible research institutes and did not reflect plans presented in the NISSAP (2019-2029). It was further noted that none of the suggested plans was worked out by the research institutions as indicated in **Table 5.2**.

Table 5.2: Number of Researches Conducted by the Research Institutions from the Financial Year 2018/19-2021/22

Entity	Planned Research	Conducted Research	% Coverage
TAWIRI	4	0	0
TARI	4	0	0
TAFORI	4	0	0
TPHPA	4	0	0

**Source:** Auditors' Analysis on the Number of Research Conducted from the NISSAP (2019-2029)

**Table 5.2** shows that none of the research on the management of Invasive Alien Species was conducted as per plans presented in the NISSAP (2019-2029).

Furthermore, there was no mechanism in place to enforce the conduct and dissemination of the results of any of the conducted researches to all responsible stakeholders in order to improve the control measures against Invasive Alien Species.

Inadequate researches on the management of Invasive Alien Species was attributed to the following reasons:

- (a) The management of Invasive Alien Species was not mainstreamed into existing research agenda of academic, research and development institutions. The review of the National Environmental Research Agenda for Tanzania 2017 2022 indicates that the issue of conduction of research on the Invasive Alien Species was not well mainstream. This is due to the fact that, the agenda has focused and prioritized researches for only invasive species in aquatic ecosystems.
- (b) Absence of Invasive Alien Species Research Fund. Through the interviews held with officials from the VPO, it was observed that there was no fund set aside to cater for the implementation of plans to enhance researches on Invasive Alien Species.

(c) Non-disbursement of allocated fund to enhance National Capacity in the Management and Research on Invasive Alien Species. Objective 3 of the NISSAP (2019-2029) insists on facilitating the nation's capacity on Invasive Alien Species. The VPO planned to annually spend TZS 1,923,500,000 on this activity, however the review of the VPO's annual progress reports (2018/19 - 2021/22) indicated that, there was no any amount of fund disbursed to enhance National Capacity in the Management and Research on Invasive Alien Species.

#### 5.2.2 Less Prioritization of the IASs in Planning and Budgeting

The interviews held with officials from the RSs and LGAs, revealed that activities related to the issue of control of Invasive Alien Species were not given the required attention and priority during the planning and budgeting. In this case, there was no any amount of fund allocated for the RSs and LGAs to control the Invasive Alien Species. Moreover, review of Annual Action Plans from the selected RSs and LGAs showed that management of Invasive Alien Species was not included in the annual action plans and budget. **Table 5.3** indicates the observed situation in the visited RSs and LGAs.

Table 5.3: Status of Planning and Budgeting for the Management of Invasive Alien Species in the Selected RSs and LGAs

Entity	Status of Planning and Budgeting for IASs
Mara RS	×
Mbeya RS	×
Morogoro RS	×
Kongwa DC	×
Serengeti DC	×
Karatu DC	×
Rungwe DC	-
Mvomero DC	✓

Source: Auditors' Analysis on the Annual Action Plans 2018/19-2021/22

**Key:** [✓]- Means available

[x]- Means not available

**Table 5.3** shows that almost all RSs and LGAs visited did not include Invasive Alien Species management in their plans and budgets. Only one LGA, Mvomero DC, had annual action plans for invasive alien species control. The LGA may have been heavily affected by *Fall Army Worms*, *Tuta Absoluta* Rodents, and *Quareaquarea* to the point that it decided to plan and finance it. These plans, however, were primarily aimed at combating invasive alien species in the agricultural sector, which was the most affected.

# 5.2.3 Inadequate Dissemination of Information on Invasive Alien Species

During interviews with Kongwa DC officials, it was revealed that there were gaps in information sharing about Invasive Alien Species research. For example, the findings of research on *Kongwa weeds* conducted by research institutions such as SUA from financial year 2018/19 to financial year 2021/22 were not shared with Kongwa DC as the key actor in the management of Invasive Alien Species.

Inadequate dissemination of research information on invasive alien species was attributed to lack of concrete collaboration among the key actors on invasive alien species control. This was also due to lack of policies that would ensure successful collaboration. Furthermore, the VPO did not monitor and evaluate cross-sectoral coordination and collaboration on Invasive Alien Species management as recommended in Action 6.2.2 of the NISSAP (2019-2029), which emphasizes effective collaboration and coordination among the key actors on Invasive Alien Species management.

Moreover, it was unearthed that there were no legal obligations or directives requiring the dissemination of information to all stakeholders. Furthermore, because the research was conducted on an ad hoc basis and primarily for academic purposes, the researcher was free to either disseminate or not disseminate the report, as the research was always conducted at the researcher's expense.

This had consequently resulted to the use of local and non-effective method of controlling the spread of Invasive Alien Species such as mechanical uprooting and slushing.

### 5.3 Inadequate Development of Goals to Control the Invasive Alien Species

Article 8 (h) of the Convention on Biological Diversity (1996) requires each country to, as far as possible and as appropriate, control or eradicate those alien species which threaten ecosystems, habitats or species. In order to comply with this requirement, the Government through section 3.1.3 (vi) of the Implementation Strategy for the National Environmental Policy (2021) requires all responsible actors in the management of Invasive Alien Species to develop and implement programmes and strategies for addressing Invasive Alien Species.

Moreover, Section 43 (4, b) of the of the EMA, 2004 insists that, each sector Ministry shall prepare and submit to the Minister, a Sectoral Environmental Action Plan which shall identify environmental problems prevalent in the area and recommend measures to mitigate the problems.

Based on the review of Strategic and Annual Action Plans from the VPO, MoA, MNRT and other stakeholders<sup>13</sup>, it was noted that, there was inadequate setting out of the individual goals to address the issue of Invasive Alien Species. In most cases there were no long term goals, instead, the Invasive Alien Species were treated and termed as emergency issues and their management relied on the magnitude of the impacts. Through the review of Strategic Plans and Annual Action Plans showed that most of the selected MDAs and LGAs did not develop goals to control IASs. **Table 5.4** gives details of the observed situation.

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 $<sup>^{13}</sup>$  Research and Academic Institutions (TAWIRI, TARI, TAFORI) and LGAs

Table 5.4: Development of Objectives by Key Actors to Control Invasive Alien Species

Entity	Goal Set	Comments on the Adequacy of the Goal
Vice President's Office	Reduce Negative Impacts of Existing Priority Invasive Species	Absence of Measures of implementation
Ministry of Agriculture	Develop contingency plans and action programs to ensure rapid eradication of newly established and undesirable Invasive Alien Species	Did not address the suggestions from the NISSAP (2019-2029)
Ministry of Natural Resources and Tourism	Threats posed by Invasive Alien Species in forest reserves reduced by June, 2026	Did not address the suggestions from the NISSAP (2019-2029)
Tanzania National Parks	Control of Invasive Alien Species in National Parks features as a permanent agenda item in the annual meetings for TANAPA ecologists, to review status of the problem and to exchange information and experience in order to tackle the problem more effectively	Did not address the suggestions from the NISSAP (2019-2029)
Tanzania Wildlife Authority	No Goal has been Set	
Tanzania Forestry Agency	No Goal has been Set	
Ngorongoro Conservation Area Authorities	To reduce the impact of existing invasive alien species to a maintenance level within the NCA and provide a framework for ongoing management of invasive alien species	Did not address the suggestions from the NISSAP (2019-2029)
Regional Secretariats	No Goal has been Set	
District Councils	No Goal has been Set	

Source: Auditors' analysis of the Strategic Plans and Annual Plans of the Visited Entities (2018/19 -2021/22)

**Table 5.4** shows that, out of fifteen (15) visited entities only five (5) entities set tangible goals to address the issue of Invasive Alien Species (IASs). Additionally, it was noted that, all of the visited Regional Secretariats and Local Government Authorities (LGAs) did not develop goals to control the impacts associated with Invasive Alien Species.

The observed omission of goals to control the Invasive Alien Species was attributed to:

- (a) Lack of awareness on management of Invasive Alien Species. Through the interviews held with officials from the visited LGAs, it was noted that most of them did not know on introduction, spread, negative impacts and control measures of Invasive Alien Species. Moreover, the review of the capacity building plans from the visited entities did not indicate the aspect of capacity building on the management of Invasive Alien Species. The Audit Team also noted that, the VPO did not develop and implement community educational and awareness programs on the management of Invasive Alien Species contrary to the directives from Action 4.1.1 of the NISSAP (2019-2029).
- (b) Inadequate capacity in terms of technical know-how and equipment by the respective entities. During the site visit, the Audit Team noted that, most of the entities did not have traditional knowledge, innovation and other practices relevant for controlling Invasive Alien Species. The commonly used methods were mechanical method such as slushing and uprooting as it was observed in Ngorongoro Conservation Area and Kongwa Ranch.

Inadequate development of goals for the introduction, spread and impact of Invasive Alien Species minimizes the effectiveness of control measures in place as a result of absence of specific direction that would be relied on during the control of Invasive Alien Species.

# 5.4 Inadequate enforcement of the Planned Control Measures for the Invasive Alien Species

Objective 2 of the NISSAP (2019-2029) directs the VPO and other stakeholders to reduce negative impacts of existing priority invasive species.

Furthermore, Section 55 (2) (4) of the Local Government (Urban Authorities) Act, 1982 and Section 118 (4) (4) of the Local Government (District Authorities) Act, 1982 directs the LGAs to suppress or control animal or insect pests or plant pests, noxious weeds or plant diseases.

Based on the review of the Annual Action Plans and their respective Annual Progress Reports from the selected LGAs, it was observed that the plans to control IASs were not implemented. The review of the plans and implementation reports did not show any aspect of controlling the Invasive Alien Species.

Moreover, apart from the LGAs not implementing plans to control IASs, it was also revealed that the VPO did not prepare any report to address the status of measures to control the impacts of Invasive Alien Species as planned in the NISSAP (2019-2029).

According to the interviews with VPO and Sectoral Ministries' officials, inadequate enforcement of planned control measures was attributed to the fact that the problem of Invasive Alien Species was not given priority and due publicity, and the problem was not declared to be a serious problem requiring a multi-sectoral approach. It was also discovered that there was no mechanism in place to ensure effective enforcement of the planned Control Measures for Invasive Alien Species.

Inadequate enforcement of planned control measures for invasive alien species leads to the spread of invasive alien species to previously uninvaded areas. According to a review of a report by Mwalongo *et al.* 

(2020), *Kongwa weeds* have been reported to cause pasture losses of up to 100% if not well controlled<sup>14</sup>.

# 5.5 Inadequate Planning and Implementation of Capacity Building Campaigns

Section 9.8 of the NBSAP (2015-2020) points out to strengthen advocacy, public awareness and sensitization on IASs and their management by 2020. In addition, objective 4 of the NISSAP (2019-2029) directs the VPO and key actors to enhance stakeholders' education on management of Invasive Species.

Review of the annual action plans and implementation reports from the selected MDAs and LGAs for the financial years 2018/19 to 2012/22, found out that plans for capacity building on the introduction, spread and impacts of Invasive Alien Species (IASs) were not conducted. Out of fifteen (15) visited entities, none of them was observed to have plans for capacity building on control of Invasive Alien Species. Furthermore, interviews held with the officials from LGAs revealed that the staff were not trained on types, introduction, spread and impacts of Invasive Alien Species.

According to the interviews held with officials from the VPO, lack of plans to enhance capacity for effective control of Invasive Alien Species resulted from the following reasons:

#### (a) Inadequate Number of Human Resources

The control of Invasive Alien Species by the VPO is conducted through the Division of Environment. The division has a total number of twenty (20) out of thirty (30) staff required to facilitate the management of Invasive Alien Species in the country. **Table 5.5** indicates the required and available numbers of officers for the management of Invasive Alien Species at the VPO.

Controller and Auditor General

<sup>&</sup>lt;sup>14</sup> Effectiveness of Selected Cultural, Biological and Chemical Methods Singly or in Integration as Management Options against Kongwa Weed (NA Mwalongo, IS Selemani, KP Sibuga, CL Rweyemamu and GF Fupi), 2020

Table 5.5: Human Resource for the Management of Invasive Alien Species at the VPO

DESIGNATION	Required Number	Available Number	Deficit
Environmental Officers	18	10	8
Fisheries Officers	3	2	1
Livestock Officers	1	1	0
Agricultural Officers	2	2	0
Forest Officers	5	4	1
Game Officers	1	1	0
Total	30	20	10

**Source**: Database of available staff at the Office of the Vice President - Environment Department (2022)

**Table 5.5** shows that the VPO did not have enough number of staff to deal with the management of Invasive Alien Species. In terms of the number of human resources available for the management of IASs, the leading cadre was the environmental officers who were ten (10) compared to the required eighteen (18), as such the human resource deficit in this cadre was eight (8), which is equivalent to 44%.

#### (b) Inadequate Expertise on Control Measures

It was revealed that there are a limited number of personnel who have acquired the knowledge or have completed specialisation in Invasive Alien Species. However, there were no plans to increase capacity building in the area of Invasive Alien Species management in any of the audited entities.

The Audit Team found that the issue of invasive alien species management was coordinated by experts from environmental sector units in many Ministries, and that there were no experts in departments that are technically responsible for specific invasive species, such as weed experts, entomologists, ecologists, pathologists, taxonomists, botanists, zoologists, and so on.

# (c) Inadequate Researches/Programs to inform effective control measures for IASs.

It was revealed that researches on proper measures to control the introduction, spread, and impacts of IAS were not carried out properly. Furthermore, plans to facilitate capacity building campaigns among entities dealing with IAS management were inadequately included. **Section 5.2.1** of this report contains information on the researches being conducted to control invasive alien species.

According to the NISSAP (2019-2029) inadequate planning for capacity building on the management of Invasive Alien Species will limit the awareness to the Government Entities and the public, on controlling the introduction, spread and impacts of Invasive Alien Species in the country.

# 5.6 Minimum Utilization of Available Resources to Control the Invasive Alien Species

Target 3.1 of the NISSAP (2019-2029) directs the Government through the VPO and key actors to ensure that at least 70% of the proposed fund for the management of Invasive Species is secured and utilized by 2024 in order to enhance the National Capacity to control the Invasive Alien Species through improvement of human resources, technology, infrastructure, knowledge and funding.

However, review of budgets and progress reports from the VPO, found out that, there was no any fund released to ensure implementation of measures suggested in the NISSAP (2019-2029). **Table 5.6** provides the actual situation regarding the allocated fund with respect to the management of IASs from the financial year 2018/19 to 2021/22.

Table 5.6: Allocated Fund to Manage Invasive Alien Species at the VPO

	Financial Year			
Item	2018/19	2019/20	2020/21	2021/22
Indicative Budget (TZS Million)	-	1,040	1,095	700
Disbursed (TZS Million)			-	

**Source**: National Invasive Species Strategic and Action Plan (2019 to 2029)

**Table 5.6** shows that in the financial year 2018/19 there were neither funds budgeted nor disbursed for the management of Invasive Alien Species as per NISSAP (2019-2029). Moreover, the budget was allocated as the subsequent in 3 FYs, however no fund was released to implement the control activities over these species that threaten the Terrestrial ecosystem.

The interviews with VPO and selected LGA officials revealed that the management of IASs was included during planning and budgeting, and thus funds were set aside to cater for the control of Invasive Alien Species (IASs), but no funds were disbursed to serve the purpose. This was due to the fact that the issue of Invasive Alien Species control was not prioritized during fund disbursement, but was instead proactively practiced (on an ad hoc basis) after a noticeable impact resulting from their introduction and spread of Invasive Alien Species.

In addition, it was noted that there was insufficient number of specialists for invasive species. Review of existing staffing levels of the VPO found that out of thirty-nine (39) available staff only four (4) out of eleven (11) staff were directly allocated in the management of Invasive Alien Species. This was the same for eight (8) visited Regional Secretariats (RSs) and eight (8) Local Government Authorities (LGAs) where, there was no any official who was directly allocated to deal with the issue of control of Invasive Alien Species.

Inadequate utilization of the available resources to deal with the management of Invasive Alien Species was attributed to:

- (a) The lack of Resource Allocation Guidelines for Managing Invasive Alien Species: This would provide guidance that includes a summary of current baseline investments for invasive species management, including financial and human resource investment, as well as targets for programs to control the introduction, spread, and impacts of Invasive Alien Species;
- (b) Absence of National Emergency Response Model for Controlling the introduction, spread and impacts of Invasive Alien Species: As suggested under Action 3.1.3 of the NISSAP (2019-2029), the emergency response model should be established to ensure funds and human resources are readily available for immediate response to new invaders. However, the Audit Team did not find any model established to meet the purpose.

The Audit Team is in the view that, both inadequate disbursement and utilization of financial and human resources during the introduction and spread of Invasive Alien Species increase the cost of dealing with the Invasive Alien Species as the result of extensive spread and stabilization of the species. For example, TANAPA spends funds annually between TZS 200 and 300 million to fight against invasive organisms in the national parks<sup>15</sup>. Moreover, the Ngorongoro Conservation Area Authority (NCAA) spent over TZS 500 million from the financial year 2018/19 to 2021/22. The amount spent by TANAPA and NCAA would have been minimized if there was proper allocation and disbursement of fund at early introduction and spread of the Invasive Alien Species.

# 5.7 Ineffective Methods to Control the Negative Impacts of Invasive Alien Species

Article 5 of the Convention concerning the Protection of the World Cultural and Natural Heritage (1972) directs each country to ensure that appropriate, effective and active measures are taken for the protection and conservation of the cultural and natural heritage situated on its

<sup>&</sup>lt;sup>15</sup> Report On Invasive Alien Organisms (TANAPA), 2019

territory. This could be done through adaptation of legal, scientific, technical, administrative and financial measures necessary for the identification, protection, conservation, and rehabilitation of the heritage.

In addition, Section 3.3 (vii) of the National Environmental Management Policy, 2021 directed the VPO and the Sectoral Ministries to promote preventive and management measures against Invasive Species. Furthermore, objective 2 of the NISSAP (2019-2029) insists the VPO and other stakeholders to reduce negative impacts of existing priority invasive species by reducing their abundance and spread to at least 50% by 2029.

Review of studies on the management of Invasive Alien Species by Mwalongo, Notkery and Andrew (2020), and Ngondya *et al.* (2016), revealed that, the control measures used for Invasive Alien Species (IASs) were mostly not effective. **Table 5.7** provides the details of the observed conditions from the selected studies on the management of Invasive Alien Species.

Table 5.7: Status and Effectiveness of Control Measures of Invasive
Alien Species

Study	Method Used	Comments on the	Auditors'
		Control Measure	Comments
Enhancing	Traditional	Not cost effective	Ineffective
Rangeland	methods such as	and needs enough	Control Measures
Productivity	uprooting or	labour if control has	as it is labour and
through Integrated	slashing	to be at a large	capital intensive
Management of		scale	
Kongwa Weed,		The improper	
2020 <sup>16</sup>	Chemical Method	usage of herbicides	
	- use of	has contributed to	Ineffective as it
	Herbicides	evolution of	might produce
		resistant biotypes	resistant biotypes
The Invasive	Chemical	Evolution of	
plants: ecological	Methods	resistant weeds,	

<sup>&</sup>lt;sup>16</sup> Mwalongo, Notkery Andrew (2020)

Study	Method Used	Comments on the	Auditors'
		Control Measure	Comments
effects, status, management challenges in Tanzania and the		higher cost of using chemical herbicides Associated with promotion of	Ineffective as it is associated with
way forward, 2017 <sup>17</sup>	Traditional Methods such as timely uprooting and cutting	germination of undesired weeds due to soil disturbance during uprooting	promotion of germination of undesired bio- organisms
Scaling Out and Assessing Efficacy of The Nature- Based Approaches for Controlling and Restoring Areas Invaded by Tagetes Minuta, Bidens Schimperi	Chemical Control	Associated with a consecutive evolution of resistant invasive weeds, environmental pollution and high costs associated chemical herbicides	Ineffective as it might result to environmental pollution and high costs associated chemical herbicides
and Gutenbergia Cordifolia in Ngorongoro Conservation Area (NCA), 2020	Mechanical Method (mowing, burning and physical uprooting)	Highly effective, Environmentally friendly, and easy management means of controlling the invasive alien species	Ineffective as it consumes a lot of time especially when there is dense invasion by Invasive Alien Species
A nature-based approach for managing the invasive weed species Gutenbergia cordifolia for sustainable rangeland	Chemical Method using herbicides	Often not advised in natural ecosystems, and particularly in protected rangelands	Ineffective as it is ecological intrusive

 $<sup>^{\</sup>rm 17}$  Ngondya, Issakwisa from the Nelson Mandela African Institution of Science and Technology (2017)

Study	Method Used	Comments on the Control Measure	Auditors' Comments
management, 2016 <sup>18</sup>			

Source: Auditors' Analysis on the Studies Conducted in the Management of Invasive Alien Species (2022)

From **Table 5.7** the authors recommended that mechanical methods (mowing, burning, and physical uprooting) be used to control invasive alien species because they are environmentally friendly and simple to implement. Furthermore, the authors deemed the rest of the suggested control methods, such as the use of chemicals, ineffective.

Furthermore, during the site visit in Kongwa DC, interviews revealed that the LGA used mechanical methods (uprooting, mowing, or fire) to control Kongwa weed. This method was found to be ineffective because it the required a significant amount of time, money, and human resources. Furthermore, through interviews with Kongwa Ranch officials, it was revealed that the ranch employs a mechanical method (mowing) that was found to be ineffective because it resulted in the uprooting of existing palatable weeds.

Furthermore, TFS officials stated in interviews that the recommended mechanical methods of uprooting and slashing plant invasive species in forest reserves were ineffective. This was attributed to the use of ineffective tools, such as pangas, to manage these species. Furthermore, a review of the Management Plan for Mount Rungwe Nature Forest Reserve (2016/17 - 2020/21) revealed an insufficient number of equipment/tools needed to control the abundance and spread of Invasive Alien Species. **Table 5.8** shows the current status of the tools needed to control invasive alien species in Rungwe Nature Forest Reserve.

<sup>&</sup>lt;sup>18</sup> Issakwisa Bernard Ngondya, Linus K. Munishi, Anna C. Treydte and Patrick A. Ndakidemi (2016)

Table 5.8: Status of Equipment for Controlling the Invasive Species at Rungwe Nature Forest Reserve

Name of Equipment	Number Desired	Number Available
Chain saws	1	0
Shovels	100	0
Hoes	100	0
Axe	50	0
Bush knifes (Pangas)	100	0
Racks	30	0
Polythene ropes	150	0
Gum boots	50	0
Gloves	50	0
Hard Hats	50	0
Polythene bags	200	0
Overalls	50	0

Source: Management Plan for Mount Rungwe Nature Forest Reserve (2016/17 - 2020/21)

Based on the information presented in **Table 5.8**, it is clearly indicated that, at Mount Rungwe Nature Forest Reserve there is no any tool that would be used to control the abundance and spread of invasive species in the forest.

The review of the article *Invasive plants: ecological effects, status, management challenges in Tanzania and the way forward* by Ngondya and Issakwisa (2017) also revealed that the control measures in the NCAA started in the 2000s through mechanical uprooting and cutting of invasive Plants. Then, as a means of facilitating the removal of the native invasive weeds *Bidens schimperi* and *Gutenbergian cordifolia*, mowing and burning were introduced. However, it has been claimed that these methods are ineffective because they require a lot of time and money. Since mowing and burning disturb the soil, such practice encourages the germination of undesirable weeds.

The following factors were attributed to the observed weaknesses in control measures for the introduction, spread, and impacts of invasive alien species:

#### High Monetary Cost of Implementing the Control Measures

The audit found that implementing the proposed IAS control measures is expensive. According to Section 2.0 of the report on the Extent and Severity of Invasive Alien Species in National Parks by TANAPA (2022), the total cost for controlling and eradicating Invasive Alien Species in National Parks for the next 25 years is estimated to be TZS 34,430,750,000.

#### Absence of National Invasive Alien Species Control Strategy

The Audit Team noted that, the country lacks a National Invasive Alien Species Control Strategy, which would outline control areas, control methods, budget, time frame, and follow-up treatment requirements. Furthermore, a review of the TANAPA Report on Invasive Alien Organisms of February, 2019 revealed that there was no National System to Control Invasive Alien Species; allowing invasive alien plants to continue entering National Parks.

The act of non-effectively controlling the Invasive Alien Species in their areas of invasion might increase their abundance and spread. This would in turn bring about effects on ecosystems as they may change the hydrology system, nutrient cycling, and habitat of native species leading to biodiversity loss.

# 5.8 Mount Rungwe Nature Forest Reserve did not control the Plant Alien Species at Kiwira Pine Plantation

The duty to protect the natural resources is of all citizens in Tanzania<sup>19</sup>. The National Forest Policy requires the establishment of relevant Policies, Strategies and Programs for conservation and utilization of forest resources, as well as the prevention and control of the causes of significant loss of forest resources<sup>20</sup>.

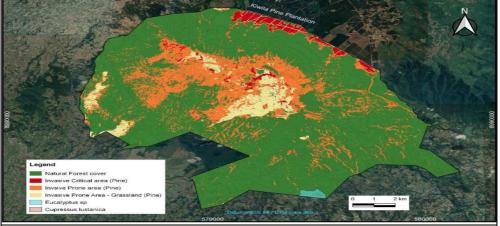
<sup>&</sup>lt;sup>19</sup> Section 27 (1) the Constitution of the United Republic of Tanzania

<sup>&</sup>lt;sup>20</sup> Page No.4 of the National Forest Policy, March, 1998

It was noted that, TFS purposefully introduced the invasive alien species, commonly known as pine species, for the purpose of having a timber plantation. The plantation with a total area of 2,820.4 hectares was established at Kiwira. This pine alien species plantation is located adjacent to the Mount Rungwe Natural Forests Reserve. According to the site visit and through the review of the research report<sup>21</sup>, the audit noted that, the Mount Rungwe Natural Forests Reserve is to a large extent invaded by the invasive alien species.

Further review of the report titled "Extent of Invasive Tree Species, Prone Areas, and Management Actions at Mount Rungwe Nature Forest Reserve, Mbeya Region, Tanzania of August 2022," noted that a total area of 4,346.08 hectares (18%) of Mount Rungwe has been invaded by different invasive species, including the pine species. Figure 5.1 shows the topographical view of the invaded area of the Mount Rungwe:





**Source:** Report titled "Extent of Invasive Tree Species, Prone Areas, and Management Actions at Mount Rungwe Nature Forest Reserve, Mbeya Region, Tanzania of August 2022

<sup>&</sup>lt;sup>21</sup> Extent of Invasive Tree Species, Prone Areas, and Management Actions at Mount Rungwe Nature Forest Reserve, Mbeya Region, Tanzania August 2022

The reviewed Management Plan for Mount Rungwe Nature Forest Reserve (2016/17 - 2020/21), showed that the following factors contributed to inadequate invasive species control in Mount Rungwe Nature Reserve:

- (i) Insufficient knowledge on invasive species, including inadequate best available management practices;
- (ii) Lack of awareness of the impacts of invasive species;
- (iii) Inadequate networking, coordination, and collaboration among departments within TFS;
- (iv) Inadequate enforcement of legislation, regulations, cross-sectoral policies;
- (v) Inadequate trained personnel and facilities; and
- (vi) Inadequate funding.

According to the review of Management Plan for Mount Rungwe Nature Forest Reserve (2016/17 - 2020/21), the habitats in Mount Rungwe Nature Reserve have been significantly altered, with the grasslands completely transformed into stands of exotic species, resulting in habitat shrinkage for many animal species. Furthermore, the spread of these invasive species has altered the hydrological regime in this area, putting the value of Mount Rungwe Nature Reserve's catchment at risk. The impact of invasive species will eventually have a significant impact on the Reserve's tourism potential, which has been identified as a potential revenue source.

#### **CHAPTER SIX**

## FINDINGS ON COORDINATION, MONITORING AND EVALUATION ON THE MANAGEMENT OF INVASIVE ALIEN SPECIES

#### 6.1 Introduction

The overall goal of the NISSAP (2019-2029) is to protect biodiversity, quality of life and economic interests of the country from the adverse impacts of Invasive Alien Species through an effective coordination, monitoring and evaluation framework together with strong sense of shared responsibility across key stakeholders at national, regional and local levels.

This chapter explains the observed situation with regards to the coordination, monitoring and evaluation of the management of Invasive Alien Species as done by the VPO, MNRT, MoA, Regional Secretariats and councils. It analyses the level at which coordination of the management of invasive species from local to national level. In addition, this chapter gives the findings on monitoring and evaluation by focusing on preparation of the annual monitoring program/plan, multi-sectoral reviews, performance review meetings and performance reporting.

The Audit Team noted that there was a limited coordination among key stakeholders to ensure effective prevention and control of IAS. Moreover, the Audit found that the VPO and the Sectoral Ministries have not adequately conducted monitoring and evaluation to track the extent of progress and achievements made towards the management of Invasive Alien Species in the country.

The details of the observed situation on this aspect are presented below.

# 6.2 VPO has not adequately Facilitated Coordination among the Key Stakeholders

Since the management of Invasive Alien Species is a multi-sectoral and cross-cutting issue, it requires an efficient and effective coordination. Section 4.1.2 of the National Invasive Species Strategy and Action Plan (NISSAP) (2019 - 2029) requires the VPO to coordinate the implementation of strategies for managing Invasive Alien Species. Also, Clause 6.1.2 of (NISSAP) (2019 - 2029) requires VPO to have and implement the mechanism to ensure effective collaboration and coordination among the key stakeholders involved in the management of invasive species from within and outside the country.

According to NISSAP, one way of doing so is through organizing regular meetings with key stakeholders. Through the meetings, VPO was supposed to share the information regarding the management of invasive species issues with Sectoral Ministries and other Government entities.

Furthermore, according to NISSAP, stakeholders ought to meet quarterly, Bi-Annually and Annual to deliberate with the sector ministries on their coordinated efforts on the management of invasive species in the country.

The interviews held with the VPO, MNRT and MoA officials pointed out that the Division meeting within VPO; Sector Directors meetings; National Steering Committee meetings; Sector Ministers' Meetings and Stakeholders' meetings were not done as planned. Instead, the meetings were only conducted through the established national task force in case of worsening situations related to invasive species.

The National Task Force (NFT) Team was established and undertook an assessment of the current list of invasive alien species in each sector and prepared a master list across all sectors. The output of the NTF was the formulation of the National Strategy and Action Plan to Manage Invasive Species (NISSAP).

Despite the existence of the strategic plan, the three ministries went ahead to execute their plans on the management of Invasive Alien Species without proper coordination.

Further, the review of performance reports (2018/2019-2021/2022) from the three ministries revealed that, management practices on invasive species were fragmented. Each sector was carrying out the management at its own interest. For example, each ministry conducts research and management approach at their own capacity and utilizing information for their own sector, despite the fact that the issue of invasive species is cross cutting. This uncoordinated practice is contrary to NISSAP (2019-2029) which requires the ministries to share information regarding the management of invasive species in the county.

The Audit Team noted that inadequate coordination was a result of the failure by VPO to implement the coordination mechanism as set in NISSAP. Lack of coordination has led to the isolated efforts among the key stakeholders involved in the management of invasive species.

Lack of cross-sectoral coordination countrywide, has hampered the success of key prayers towards managing invasive species in the country, for example, in Wildlife sector, institutions like Tanzania National Parks (TANAPA) and Ngorongoro Conservation Area Authority (NCAA) have done a tremendous job in managing IASs, and spent a lot of funds for control and monitoring IASs in their areas. However, they are still facing some challenges because some of the invasive species are brought in the parks from outside, where there is no measure to control invasive species.

# 6.3 Invasive Alien Species Information Sharing across Sector was Inadequate

Section 2.1 of the NISSAP (2019-2029) indicated that the agriculture, wildlife and forest sectors are the most affected by the problem of Invasive Alien Species in the country.

Therefore, there was a need for sharing the available information on invasive species to a centralized coordination unit for compilation and finally be made public.

Clause 6.2.3 of NISSAP requires VPO to develop and implement a framework for quarterly reporting on Invasive Alien Species issues. In order to ensure that all stakeholders are effectively implementing the Strategy, quarterly reports are supposed to be prepared and submitted to the responsible entities.

However, the review of progress reports from MNRT, MoA and PO-RALG for the financial year from 2018/2019 to 2021/22 revealed that the ministries did not share information regarding the management of Invasive Alien Species in their respective areas.

Also, the review of performance reports (2018/2019-2021/2022) from the three ministries revealed that, the management practices on invasive species were fragmented. Each sector was carrying out the management at its own interest. For example, each ministry conducted research and management approach at its own capacity and utilizing information for its own sector, despite the fact that the issue of invasive species is cross cutting. This uncoordinated practice is contrary to NISSAP (2019-2029) which requires the ministries to share information regarding the management of invasive species in the county.

During field visit by the auditors and through interviews, it was found that there were a number of activities that were done by sectors in managing Invasive Alien Species. For example, the review of Plan and budget (2018/2019-2021/2022) for the Tanzania National Parks (TANAPA) and Ngorongoro Conservation Area Authority (NCAA) indicated that the

authorities set aside fund for managing invasive species in their areas. Despite the said efforts made by TANAPA and NCAA, the Audit noted that the authorities never shared the implementation status (report) to the VPO, and other ministries as required by NISSAP.

The State of Environment Report of 2019 indicated that, lack of updated sharing of information was attributed to lack of adopting the mechanism set out by NISSAP to ensure effective collaboration and coordination for the management of Invasive Alien Species.

The insufficient sharing of information and cooperation among sectors led to the perpetuation of the invasion problem. For example, in Kongwa District, a noxious weed known as *Astripomoea Hyoscyamoides* spread more than it was before. It has invaded the area and led to decline of land productivity in crops and pasture. The weed was reported to spread to other areas apart from Kongwa Districts, these areas include Handeni, Kiteto, Singida, Kondoa, Chamwino, Bahi, Gairo, Morogoro, Korogwe, Mwanga, Manyoni, Pwani-Ruvu, Nkasi and other districts of Tanzania<sup>22</sup>.

### 6.4 Inadequate Trans-Boundary Cooperation

International cooperation is inevitable to curb the spread of invasive species. United Republic of Tanzania has ratified international conventions and enacted national legislations which are focused in addressing invasive species issues.

The country ratified the International Plant Protection (IPP) Convention since 1951 in order to facilitate inspection of consignments with plants and/or plant parts moving across international borders.

Action 6.1.1 of NISSAP required VPO to strengthen trans-boundary partnerships. VPO have to ensure good partnership among bordering

<sup>&</sup>lt;sup>22</sup> Research on Enhancing Rangeland Productivity and Community Livelihoods through Integrated Management of Noxious Weeds in Kongwa District, SUA (2019)

nations of Kenya, Uganda, Burundi, Rwanda, Democratic Republic of Congo (DRC), Zambia, Mozambique, and Malawi.

Inadequate management of Invasive alien species in the country is also attributed to increased international trade. According to the State of Environment Report of 2019, Invasive Alien Species were brought through different pathways from the neighbouring countries. According to the report, Invasive Alien Species were more prominent in the bordering areas. This calls for joint regional efforts to strengthen the cooperation towards implementing the regional agreement for protection and control of invasive species.

Enquiry made at the VPO showed that, VPO did not take action such as to establish coordination and communication mechanism for effective management of Invasive Species to all relevant stakeholders and strengthening trans-boundary partnerships on management of Invasive Species. Because of this weakness, there is high risk of invasive species from foreign countries to be continuously flowing into the country through different pathways such as transport contaminant, escape, corridors and unaided. Furthermore, insufficient information exchange hampered the progress towards identification and prevention of the introduction of invasive species in the country.

## 6.5 Absence of Annual Program for Monitoring and Evaluation of Invasive Alien Species

Section 4.2.2 of the NISSAP (2019 - 2029) requires VPO to prepare annual monitoring program in order to provide the feedback that triggers adjustments to actions, plans and budgets, to ensure that they are realistic and are being adhered to.

Interviews with the officials from the VPO, noted that, the VPO did not have any documented program for monitoring and evaluation of issues related to the management of Invasive Alien Species.

The absence of the annual monitoring and evaluation program was attributed to inadequate prioritization of the issue of monitoring and evaluation of the management of Invasive Alien Species by VPO.

Lack of monitoring and evaluation program hinders the VPO to conduct monitoring to assess the extent of progress towards implementing NISSAP (2019-2029). Also lack of monitoring and evaluation program by VPO has resulted into non-availability of updated information on performance of Sectoral Ministries towards implementing NISSAP.

### 6.6 Ineffective Reporting Systems

Section 32 (1, a) of the EMA, 2004 requires the Sectoral Ministries through the Sector Environmental Coordinator to submit to the Director of Environment a bi-annual report concerning the state of that segment of the environment and the measures taken by that sector Ministry to maintain or improve the environment. In addition, the NISSAP sets a reporting system in line with the requirement of EMA, 2004. However, it was noted that the reporting system did not adequately function as explained hereunder.

## 6.6.1 Lack of Implementation Reports on the Management of IAS from Sectoral Ministries and LGAs to VPO

Clause 4.2.5.1.1 of the National Invasive Species Strategy and Action Plan (2019-2029) requires, the VPO to receive implementation reports from MDAs and LGAs on the implementation of NISSAP on quarterly and annually basis.

VPO did not receive any report or information from Sectoral Ministries and LGAs showing the progress toward implementation of NISSAP. **Table 6.1** indicates the requirement of reporting and the observed situation on the ground.

Table 6.1: Planned and Actual Number of Annual Reports received by VPO

Report	2018	/19	2019/20		2020/21		2021/22	
initiator	Planne	Actua	Plane	Actua	Plane	Actua	Planne	Actua
	d	l	d	l	d	l	d	l
MoA	1	0	1	0	1	0	1	0
MNRT	1	0	1	0	1	0	1	0
Serenget i DC	1	0	1	0	1	0	1	0
Kongwa DC	1	0	1	0	1	0	1	0
Mvomero DC	1	0	1	0	1	0	1	0
Rugwe DC	1	0	1	0	1	0	1	0
Karatu DC	1	0	1	O SLAUD	1	0	1	0

Source: Auditors' Analysis of VPO Progress Reports

**Table 6.1** shows that the actors were not submitting their reports to the VPO.

The audit noted that lack of submission of report from sector ministries to VPO was caused by the failure of VPO to fulfil its accountability of reminding and enforcing the entities to submit environmental reports as required by Environmental Management Act, 2004 (Section 36(3)) as well as NISSAP (2019-2029).

The tendency of not reporting the state of invasive species in their territories hinders the VPO from having the updated holistic status of Invasive Alien Species for effective management of the same.

Furthermore, the Audit Team noted that VPO did not make effective measures to ensure that reports were regularly submitted as per NISSAP requirements. Since 2019 up to time of this audit, it is only once (2021) when VPO wrote a letter to Sector Ministries and LGAs reminding them to submit annual plans and reports showing the way the said entities address the NISSAP.

## 6.6.2. Lack of Reports on the Management of IAS from the VPO to the Sectoral Ministries and LGAs

Clause 4.2.5.1.2 of the National Invasive Species Strategy and Action Plan requires the VPO to compile annual and midterm reports on implementation of the strategy and any other issue regarding to invasive species in the country. The VPO is supposed to disseminate the reports or information to MDAs and LGAs.

However, interviews with officials from VPO revealed that, the VPO did not send report or publish information to the Sectoral Ministries and LGAs showing the progress and status on management of Invasive Alien Species. **Table 6.2** indicates the status of dissemination of reports on mid-term and annual basis.

Table 6.2: Annual Report disseminated to MDAs and LGAs

Mid-	201	8/19	2019/20		2020/21		2021/22	
Term	LGAs	MDAs	LGAs	MDAs	LGAs	MDAs	LGAs	MDAs
1 <sup>st</sup>	No	No	No	No	No	No	No	No
2 <sup>nd</sup>	No	No	No	No	No	No	No	No

**Source:** Auditors' Analysis of correspondence file from VPO and review of environment publications.

#### Key

**Yes**-if report was disseminated by VPO **No**-if report was not disseminated by VPO

Based on **Table 6.2**, it can be seen that VPO did not give any documented feedback to the Sector Ministries, MDAs and LGAs regarding implementation of the strategy on invasive species.

As a result, VPO failed to make follow up and notice any changes that took place in the LGAs and Sector Ministries towards prevention and control of invasive species in the country.

The failure to disseminate reports denied other stakeholders to have reliable information on matters related to invasive species from all stakeholders. Some LGAs were noted to be not familiar with the information on the new spread and management of the invasive species in the country, their impact and their monitoring and evaluation if known.

## 6.7 Inadequate Use of the Developed Performance Indicators by the VPO

Clause 4.2.1.3 of the National Invasive Species Strategy and Action Plan (NISSAP) (2019 - 2029) requires VPO to use the set indicators to measure whether or not the planned activities are being implemented towards achieving the national strategy.

However, there was no any document showing that the set indicators were used for assessing the performance towards addressing national strategy for the management of invasive species.

The Audit Team noted that, lack of using the set indicators was attributed to inadequate prioritization of the management of Invasive Alien Species by VPO to assess the progress towards the implementation of NISSAP. This is because, the review of MTEF (2018/2019-2021/2022) revealed that VPO did not set aside fund specifically for monitoring and evaluation of the progress towards the implementation of NISSAP.

Non-use of the set indicators has denied VPO to have the picture on the progress made by all sectors affected by the spread of invasive species towards addressing the agreed targets on the prevention and control of the spread of invasive species in the country.

### 6.8 Lack of Performance Review Meetings

According to clause 4.2.1.2 of the National Invasive Species Strategy and Action Plan, the VPO is supposed to ensure that performance review meetings are conducted regularly to track the progress against targets and indicators set in the NISSAP.

The Audit Team noted that neither records of meeting minutes nor attendance were kept showing if there was any meeting conducted. **Tables 6.4** and **6.5** indicate the requirement of performance review meetings and the actual situation on the ground.

Table 6.4: Planned and Actual Number of Performance Review Meetings

Type of	2019/20		2020	/21	2021/22	
Meeting	Required	Actual	Required	Actual	Required	Actual
Division Meetings/VPO	4	0	4	0	4	0
Sector Directors' Meeting	4	0	4	0	4	0

Source: Auditors' Analysis of the Correspondence File (Agriculture File) from the VPO (2018/19-2021/22)

Table 6.5: Bi-Annual and Annual Meetings

Type of	Type of Type of		2019/20		2020/21		/22
Meeting	Meeting	Requir ed	Act ual	Require d	Actua l	Require d	Actua l
Division	Bi-Annual		INA	OI			
Meetings/VP		2	0	2	0	2	0
0							
Sector	Annual						
Directors'		1	0	1	0	1	0
Meeting							
Stakeholder	Annual	1	0	1	0	1	0
s' Meeting		ı	U			ı	0

**Source:** Auditors' Analysis of the Correspondence File (Agriculture File) from the VPO (2018/19-2021/22)

Both **Tables 6.4** and **6.5** show that up to the financial year of 2021/2022 no performance review meeting was conducted by the VPO.

This resulted in failure of VPO to have the updated status of the progress made against the targets and indicators set for achieving national goals for prevention and control of invasive species in the country.

#### CHAPTER SEVEN

#### CONCLUSIONS

#### 7.1 Introduction

This chapter presents the audit conclusions based on the findings as per the general and specific objectives of this audit. The details of this chapter are explained hereunder.

The Audit Team acknowledges the work done by the Government through the Vice President's Office (VPO), Sectoral Ministries, Sectoral Entities, Regional Secretariats and Local Government Authorities towards the management of Invasive Alien Species in the country. However, there is a great need for improving the coordination and collaboration system among these entities in order to enhance the effectiveness of the management measures for preventing and controlling the Invasive Alien Species in the country.

#### 7.2 General Conclusion

Despite the fact that the Government of Tanzania has undertaken some initiatives such as establishment of NISSAP (2019-2029) in order to manage the occurrence of Invasive Alien Species in terrestrial environments, the Invasive Alien Species were observed to be not adequately managed.

The prevention measures against the Invasive Alien Species in Terrestrial Environment were noted to be not adequate. This was indicated by the fact that, VPO did not identify and manage the priority pathways and vectors of the Invasive Alien Species, inadequate prevention of the Invasive Alien Species at the International Borders (Ports of Entry). Moreover, the VPO in collaboration with the Sectoral Ministries did not manage to conduct Risk and Environmental Impact Assessment of Potential Invasive Alien Species to enable effective prevention of the introduction and spread of Invasive Alien Species.

Furthermore, there were weaknesses in the control measures used by the VPO and Sectoral Ministries in controlling the Invasive Alien Species in the country. This was manifested by the absence of national database for Invasive Alien Species, inadequate research on Invasive Species, inadequate development of goals to control the Invasive Alien Species and inadequate enforcement of plans to control these species. It was also noted that, there was minimum utilization of resources to control the Invasive Alien Species as well as ineffective methods to control the negative impacts of the Invasive Alien Species.

It was further revealed that, there was no combined effort and coordination to ensure adequate management of Invasive Alien Species in the country. This was reflected by absence of combined efforts for implementation of NISSAP 2019-2029 by all responsible agencies, inadequate sharing of information across the sector and all stakeholders and inadequate trans-boundary cooperation.

The monitoring and evaluation of the management of Invasive Alien Species in the country was not adequately done. This was due to the absence annual program for monitoring and evaluation, ineffective reporting system, inadequate application of developed targets and performance indicators on the management of Invasive Alien Species and lack of follow ups and performance review meetings to establish the status of implementation of plans to manage the Invasive Alien Species.

### 7.2 Specific Conclusions

The following are the specific conclusions:

# 7.2.1 Inadequate Management of the Prevention Measures of the Invasive Alien Species in Terrestrial Environment

Prevention approach as the first line of defence against the introduction and spread of Invasive Aline Species in terrestrial environment was no effectively practiced by the VPO, Sectorial Ministries and other related stakeholders.

The VPO did not identify and manage the priority pathways and vectors of the Invasive Alien Species in terrestrial environment for effective setting of preventive measures. This was because, there were inadequate researches on the areas of the priority pathways which would help to provide information that would guide on the choice of an appropriate intervention approaches against the Invasive Alien Species.

At the Ports of Entry, the VPO and the Ministry of Agriculture did not adequately ensure that the preventive measures were well launched to inhibit alien species coming from abroad which survived during and after the passage. Additionally, nine (9) out of forty (40) ports of entry equivalent to 22.5% did not have inspectors thus influencing to the potential presence of escapes for the introduction of Invasive Alien Species in the country. Furthermore, there was inadequate number of equipment for inspection of imported and exported materials at the Ports of Entry.

Similarly, the Ministry of Natural Resource and Tourism through NCAA and Serengeti National Park did not properly manage to put in place an effective preventive approach of the introduction of Invasive Alien Species either intentionally or unintentionally through entrance posts at the protected areas. Although there was regular inspection of the visitors at the protected areas, but no intensive inspection related to the alien species entering was done at the entrance gates of the protected areas and national parks. This was caused by inadequate resource (funds, expertise, and machinery) to effectively and efficiently deal with the prevention of invasive species. Additionally, it was also due to lack of common understanding and strategy between the protected areas, the national parks and the adjacent communities on dealing with invasive species.

Despite the fact that, Invasive Alien Species especially the plant invasive species were more likely to be found closer to roads and settlements, thus, giving an opportunity for early detection, and therefore effective rapid response, the VPO and Sectoral Ministries did not effectively utilize this opportunity in preventing the spread of Invasive Alien Species in the

country. This resulted from the fact that there was no national surveillance system for the management of Invasive Alien Species that gave directives to all key stakeholders during the early detection and rapid response to the Invasive Alien Species.

In order to enable productive prevention of Invasive Alien Species, conduction of risk and environmental impact assessment of possible and potential Invasive Alien Species is paramount. However, there was no efforts by the VPO and related stakeholders to conduct risk and environmental impact assessment of potential Invasive Alien Species that could be brought in the country through the projects implemented in Tanzania. This was contributed to lack of risk implementation strategy or action plan in place that would guide the provision on how the risk and environmental strategy should be done, how much budget and the number of experts who would be involved in ensuring how invasive species were encountered before they entered in country.

# 7.2.2 Inadequate Implementation of Control Measures of Invasive Alien Species

The VPO and the Sectoral Ministries could not adequately control the Invasive Alien Species in the country. The issue of control of Invasive Alien Species was reactively practised after an extensive spread and notable economic impact of these species.

There was no National Database of Information for Invasive Alien Species that could form the basis for formulation of different management goals towards control against the invasive species.

It was further noted that, there was inadequate setting out of the individual goals by the key actors to address the issue of Invasive Alien Species. In most cases there were no long term goals, instead, the issue of management of Invasive Alien Species was treated and termed as emergency issue and reactively relied on the magnitude of the impacts resulted from the Invasive Alien Species.

The control of Invasive Alien Species was mostly not given priority during planning and budgeting. This was reflected by the absence of control aspects in all annual action plans and their respective implementation reports of the audited entities such as the VPO and the Sectoral Ministries. Moreover, it was found out that plans for capacity building on the introduction, spread and impacts of Invasive Alien Species (IASs) were not available.

Moreover, there was minimum utilization of available resources to control the Invasive Alien Species, this was portrayed by inadequate capacity in terms of equipment and personnel to undertake the control of invasive species. Some of the entities were seen to be unaware of the invasive species and could not immediately realise their economic, social and environmental impacts. This resulted from inadequate capacity building among the key actors thus deterioration of measures to control the Invasive Alien Species.

It was further noted that the methods that were practiced by the key actors on controlling the spread and introduction of Invasive Alien Species were not effective. This was evidenced by the absence of national Invasive Alien Species control strategy as well as inadequate capacity in terms of equipment and chemicals for controlling the Invasive Alien Species.

However, the observed inadequacies were to a large extent contributed by the minimal efforts by the VPO and the Sectoral Ministries to realize the potential of ensuring that the Invasive Aliens Species were controlled in order to minimize their social, economic and environmental impacts.

# 7.2.3 Inadequate Coordination in Management of the Invasive Alien Species in Terrestrial Environmental

It was noted that there was a limited coordination among the key stakeholders to ensure effective prevention and control of IAS. The limited coordination in the management of IAS was manifested through the weak collaboration between VPO and other Sectoral Ministries. Actually, VPO and the responsible key actors did not effectively collaborate to ensure effective prevention and control of IAS.

There were no coordination reports or information sharing system for the management of Invasive Alien Species availed to auditors for scrutiny. This was mainly attributed to lack of specified accountability in implementing the set coordination mechanisms by VPO with regards to the management of Invasive Alien Species in the country.

In addition, it was noted that there was inadequate conduction of meetings to address the issue of Invasive Alien Species by the VPO and Sectoral Ministries. The meetings were occasionally conducted through the established national task force, in case of worsening situations related to invasive species.

Furthermore, the VPO and Sectoral Ministries did not ensure proper information sharing between them. This was due to fragmentation of the management practices on invasive species as each sector was carrying out the management at its own interest. Likewise, there was inadequate sharing of the progress and implementation status on the management of Invasive Alien Species by the Sectoral Ministries to the VPO. For the case of mechanism set out by NISSAP (2019-2029), it was noted that the adoption of such mechanism, to ensure effective collaboration and coordination for the management of Invasive Alien Species, was limited.

The VPO did not take action such as to establish coordination and communication mechanism for effective management of Invasive Species to all relevant stakeholders and strengthening trans-boundary partnerships on the management of Invasive Species. Because of this weakness, there is a high risk of invasive species from foreign counties to be continuously flowing into the country through different pathways such as transport contaminant, escape, corridors and unaided.

# 7.2.4 Monitoring and Evaluation of Strategies for Management of Invasive Alien Species were not adequate

Despite having a well-structured NISSAP with indicators for the management of invasive species by VPO and Sectoral Ministries; VPO has not conducted sufficient monitoring activities to establish the extent to which developed indicators have been implemented.

The absence of the annual monitoring and evaluation program was one of the observed weaknesses in ensuring effective monitoring and evaluation by the VPO. This has in turn resulted into non-availability of updated information on performance of Sectoral Ministries towards implementing NISSAP 2019-2029.

Furthermore, it was noted that the reporting system on the Management of Invasive Alien Species was not effective. This was manifested by the absence of the Implementation Reports on the Management of IAS from Sectoral Ministries and LGAs to VPO as well as absence of the reports on the Management of IAS from the VPO to the Sectoral Ministries and LGAs.

In addition, there were no any measures adopted to measure the set indicators whether or not the planned activities on the management of Invasive Alien Species are being implemented towards achieving the national strategy. This had denied the VPO to have the clear picture on the progress made by all sectors affected by the spread of invasive species towards addressing the agreed targets on the prevention and control of the spread of invasive species in the country.

There was also inadequate review of the performance review meetings. Up to the financial year of 2021/2022 no performance review meeting was conducted by the VPO. This resulted in the failure of VPO to have the updated status of the progress made against the targets and indicators set for achieving national goals for prevention and control of invasive species in the country.

### **CHAPTER EIGHT**

### **RECOMMENDATIONS**

### 8.1 Introduction

There were identified weaknesses in the management of Invasive Alien Species in Terrestrial Environment by the VPO and the Sectoral Ministries. The Audit Team has proposed measures for improvements on the audited area based on the scope and specific objectives of this audit. This is to ensure improved prevention and control of Invasive Alien Species as well as to enhance the coordination, monitoring and evaluation of performance towards management of these species.

#### 8.2 Recommendations Issued to the Vice President's Office

# 8.2.1 To Enhance Effectiveness of the Prevention Measures of the Invasive Alien Species in Terrestrial Environment

The VPO in collaboration with the relevant Sectoral Ministries is urged to:

- (i) Establish mechanism that will ensure effective preventive measures of the Invasive Alien Species at the Ports of Entry and the entrance of the protected areas and national parks;
- (ii) Strengthen the strategies to ensure that researches are conducted on introduction, spread and impacts of Invasive Alien Species in the country;
- (iii) Strengthen the capability of its workforce with expertise in invasive alien prevention measures, and
- (iv) Establish a mechanism that will ensure short and long term plans are aligned with the emergency response procedures for early detection of Invasive Alien Species.

# 8.2.2 To Strengthen Effectiveness of the Control Measures of the Invasive Alien Species in Terrestrial Environment

The VPO in collaboration with the relevant Sectoral Ministries is urged to:

- Develop and strengthen a centralized National Invasive Species Database to be used to record and track invasive species occurrences and control efforts across the country;
- (ii) Improve advocacy, public awareness and sensitization on Invasive Alien Species and their control measures; and
- (iii) Strengthen the capacity of its staff to control the Invasive Alien Species in terms of technical know-how and equipment.

# 8.2.3 To Strengthen Coordination Among the Key Actors in Management of the Invasive Alien Species

The Vice President's Office is urged to:

- (i) Establish a mechanism to ensure that measures for effective collaboration and coordination in the management of Invasive Alien Species are adopted by all key actors; and
- (ii) Develop a system to facilitate trans-boundary cooperation between the country (Tanzania) and all neighbouring countries in the Management of Invasive Alien Species.

### 8.2.4 To Ensure Effective Monitoring and Evaluation

The Vice President's Office is urged to:

(i) Develop and implement monitoring and evaluation program for the management of Invasive Alien Species in the Country; and

(ii) Set mechanism to ensure effective reporting for the implementation of measures to deal with Invasive Alien Species.



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## **APPENDICES**



### Appendix 1: Responses from the Vice President's Office

This part provides details on the overall responses from the audited entities and the responses for the comments, action to be taken and implementation timeline for each of the issued recommendation.

### A: General Comment

- i. It should be noted that the role of VPO in the implementation of the National Strategy on management of invasive Species in Coordination. The implementation at ground level is done by relevant sector.
- ii. It should further be noted that there is no specific fund which allocated for implementation of the NISSAP. Sectors were required to budget and allocate funds from their budget.
- iii. The language used can be softened.

### **B: Specific Comment**

SN	RECOMMENDATIONS	COMMENT(S)	ACTIONS TO BE TAKEN	TIMELINE				
Spec	To Enhance Effectiveness of the Prevention Measures of the Invasive Alien Species in Terrestrial Environment, the VPO in collaboration with Sectoral Ministries is urged to:							
1.	Establish mechanism that will ensure effective preventive measures of the Invasive Alien Species at the Ports of Entry and the entrance of the protected areas and national parks	is Genuine The mechanism for the prevention is in place and the	Invasive Alien Species at the Ports of Entry and the entrance of the protected areas	2024-2027				

SN	RECOMMENDATIONS	COMMENT(S)	ACTIONS TO BE TAKEN	TIMELINE		
		effective prevention of IAS.				
2.	Strengthen the strategies to ensure effective research on introduction, spread and impacts of Invasive Alien Species in the country	Some initiative on IS research are in progress Also the National Environmental Master Plan has also indicated IS research as a national priority.	The strengthen strategic intervention for improved in Coordination research institutions	2023-2025		
3.	Strengthen the capacity of the available preventive measures of the Invasive Alien Species	The recommendation is Genuine	To raise awareness to stakeholders on the available preventive measures of the invasive species.	2025-2026		
4.	Establish a mechanism that will ensure short and long term plans aligned with the emergency response procedures for early detection of Invasive Alien Species	The recommendation is Genuine	To Establish a mechanism that ensure short and long term plans aligned with the emergency response procedures for early detection of Invasive Alien Species.	2024-2028		
To Strengthen Effectiveness of the Control Measures of the Invasive Alien Species in Terrestrial Environment, the VPO in collaboration with the relevant Sectoral Ministries is urged to:						
1.	Develop and strengthen a centralized National	Though there is no specific database for	To strengthen the centralized National	2025-2028		

SN	RECOMMENDATIONS	COMMENT(S)	ACTIONS TO BE TAKEN	TIMELINE
	Invasive Species Database to be used to record and track invasive species occurrences and control efforts across the country	invasive species. Species information are available at the TANBIF hosted at COSTECH as centralized National Biodiversity Information data base that have all known species found in Tanzania.	Invasive Species Database to be used to record and track invasive species occurrences and control efforts across the country.	
2.	Improve advocacy, public awareness and sensitization on Invasive Alien Species and their control measures	The		A continuous activity
3.	Strengthen the capacity to control the Invasive Alien Species	The recommendatio n is genuine	To coordinate the development	2025-2027

SN	RECOMMENDATIONS	COMMENT(S)	ACTIONS TO BE	TIMELINE
J. \		30//2/12/17/(5)	TAKEN	
	in terms of technical		capacity	
	know-how and		Building	
	equipment		programme for	
			control of	
			Invasive species	
To S	trengthen Coordination	Among the Key A	ctors in Manager	ment of the
Invas	ive Alien Species, the Vi	ce President's Offic	ce is urged to:	
	Establish a mechanism	The	To develop and	
	to ensure that	recommendatio	implement	
	measures for effective	n is genuine	framework for	
	collaboration and		coordination	
1.	coordination in the		among	2024-2026
	management of		stakeholders	
	Invasive Alien Species			
	are adopted by all key			
	actors	CHAL AUDIT		
	Develop a system to	The	To strengthen	
	facilitate trans-	recommendation	trans -boundary	
	boundary cooperation	is genuine	partnerships	
2.	between the country	MOI	for enhanced	2024-2028
۷.	(Tanzania) and all		management of	2024-2026
	neighbouring countries		IS	
	in the Management of			
	Invasive Alien Species			
To E	nsure Effective Monitorii	ng and Evaluation,	the Vice Presider	nt's Office is
urged	d to:			
	Develop and	The	To develop and	
	implement monitoring	recommendation	implement a	
	and evaluation	is genuine	national	
1.	program for the		invasive species	2023-2024
1.	management of		management	2023-2024
	Invasive Alien Species		monitoring and	
	in the country		evaluation	
			framework.	
	Set mechanism to	The	To put in place	
2.	ensure effective	recommendation	mechanism for	2024-2025
۷.	reporting for the	is genuine	effective	7074-7072
	implementation of		reporting	
<u> </u>	roller and Auditor Genera			

SN	RECOMMENDATIONS	COMMENT(S)	ACTIONS TO BE TAKEN	TIMELINE
	measures to deal with Invasive Alien Species			



### Appendix 2: Audit and Sub Audit Questions

This part contains the man Audit Questions and sub- Audit and Sub Audit Questions which were used in this report.

Audit Question 1	To what extent does the VPO manage the prevention measures of the Invasive Alien Species in Terrestrial Environment?
Sub-Question 1.1	Has the VPO identified and managed priority pathways and vectors of invasive species in order to understand their introduction and spread in terrestrial environments?
Sub-Question 1.2	To what extent is prevention of Invasive Alien Species at the Ports of Entry effective?
Sub-Question 1.3	Are the Entrance Berries at the Protected Areas and National Parks well prevented from the introduction of Invasive Alien Species?
Sub-Question 1.4	To what extent do the VPO and the Sectoral Ministries implement the Procedures for Early Detection and Rapid Responses?
Sub-Question 1.5	To what extent do the VPO and the Sectoral Ministries conduct risk and environmental impact assessment of potential Invasive Alien Species?
Sub-Question 1.6	Were the Risk and Environmental Impact Assessment of Potential Invasive Alien Species effectively conducted by the VPO and the Sectoral Ministries?
Audit Question 2	Does the VPO have a well-functioning Control System of the Invasive Alien Species to mitigate or eradicate their negative impacts on environment?
Sub-Question 2.1	Is there reliable database of information for Invasive Alien Species to enhance measures to control their negative impact?
Sub-Question 2.2	Has VPO and the Sectoral Ministries developed effective goals towards control of Invasive Alien Species in the country?
Sub-Question 2.3	Do the VPO and the Sectoral Ministries effectively enforce the planned control measures for the Invasive Alien Species?
Sub-Question 2.4	Do the VPO and the Sectoral Ministries plan and conduct capacity building campaigns to ensure that the Invasive Alien Species are controlled?
Sub-Question 2.5	Do the VPO and the Sectoral Ministries use the available resources to ensure effective control of Invasive Alien
	Species?

	Species effective?
Audit Question 3	Does the existing coordination at VPO support effective management of Invasive Alien Species in Terrestrial Environment?
Sub-Question 3.1	To what extent is the mechanism (system) for coordination and communication of management of Invasive Alien Species effective?
Sub-Question 3.2	Is the Invasive Alien Species information sharing across sector adequate?
Sub-Question 3.3	To what extent has VPO strengthened the trans-boundary partnerships?
Sub-Question 3.4	Does the existing reporting system between the VPO and the Sectoral Ministries function well to enhance effective management of Invasive Alien Species?
Audit Question 4	Do the VPO and the Sectoral Ministries adequately monitor and evaluate performance of laid down Strategies for the management of Invasive Alien Species?
Sub-Question 4.1	Do the VPO and Sectoral Ministries have risk based plan to monitor and evaluate the implementation of strategies to manage the Invasive Alien Species?
Sub-Question 4.2	Do the VPO and Sectoral Ministries regularly report on the performance of the management of Invasive Alien Species?
Sub-Question 4.3	Are the results from monitoring and evaluation used to improve the strategies for management of Invasive Alien Species?
Sub-Question 4.4	Do the VPO and the Sectoral Ministries ensure follow up (performance review) on the implementation of recommendations from monitoring and evaluation reports?

### Appendix 3: Selected Invasive Aliens Species

This part provides the list of selected Invasive Alien Species covered by this audit, as well as the reasons for their selection. It includes the affected sector, scientific name, and common name of each invasive species.

Sector Affected	Scientific Name	Common Name	Status	Reason for Selection
	Spodoptera frugiperda	Fall armyworm	Selected	Commonly available and has great impact on plant health
	Tuta absoluta	Tomato Leaf Miner	Selected	Commonly available and has great impact on tomato plantation health
	Astripomoea hyoscyamoidse	kongwa weed	Selected	Commonly available in Dodoma, Morogoro, Manyara, Singida and Tanga and has great impact on agricultural and pastoral land
Agriculture	Bactrocera dorsalis	Oriental fruit	Not selected	
	Aleurodicus disperses	Spiralling Whitefly	Not selected	
	Xanthomonas campestris	Banana Xanthomonas Wilt	Not selected	
	Fusarium oxysporum f.sp. Cubense		Not selected	
	Maize Lethal Necrosis		Not selected	
	Chromolaena odorata	Siam weed,	Selected	Wide spread, commonly available and has great
	Gutenbergia cordifolia	Gutenbergia	Selected	impact on wildlife pastoral land
Wildlife	Parthenium hysterophorus	Carrot weed	Selected	Commonly available in Arusha, Kilimanjaro, Kagera and Manyara and has great impact on agricultural and pastoral land
	Caesalpinia decapitala	Mauritius thorn	Selected	Wide spread, commonly available and has great impact on wildlife pastoral land
	Corvus splendens	Indian house Crow	Selected	Commonly available in coastal regions and it is

Sector Affected	Scientific Name	Common Name	Status	Reason for Selection
				aggressive thus it has diminished the number of local species
	Eleusine jaegeri		Not selected	
	Acacia zanzibarica		Not selected	
	Acacia mearnsii		Not selected	
	Maesopsis eminii		Not selected	
	Leptocybe invasa		Not selected	
	Cinara cupressi sensu lato		Not selected	
Forest	Leptocybe invasa		Selected	Commonly found in the forest reserves and has
	Lantana camara	Tickberry, Lantana	Selected	impacted the growth of forest plantations
	Cedrella odorata	AND ALA	Not selected	
	Acacia mearnsii		Not selected	
	Thaumastocoris peregrinus	NAC	Not selected	

**Source**: Analysis of the Stakeholders' and Task Force Team Member's ranking from the National Invasive Species Strategy and Action Plan (NISSAP) (2019 - 2029).

## **Appendix 4: Selection of Entry Points**

The part shows the selection process for the entry point. It shows the existence of borders throughout all regions, their modes of entry and exit, and their modes of operation.

N/S	Region	Entry point	Means of entry/ departure	Operation hrs	Selection status	Reasons for selection
1.	Arusha	Namanga	Road	24	Selected	Potential and busy entry point for road users in the Northern zone
		Arusha airport	Air	12	Not selected	
2.	Mara	Bologonja	Road	12	Not selected	
		Shirati	Road	12	Not selected	
		Kogaja	Road	12	Not selected	
		Sirari	Road	24	Selected	Potential and busy entry point for road users in the Lake and Western zone
3.	Kilimanjaro	Tarakea	Road	12	Not selected	
		Holili	Road	24	Not selected	
		KIA	Air	24	selected	Potential and busy entry point
		Moshi Airport	Air	12	Not selected	
4.	Tanga	Horohoro	Road	24	Not selected	
		Mwakijem be	Road	12	Not selected	
		Tanga seaport	Vessel	12	Not selected	
5	Dar es Salaam	Dar Es Salaam Seaport	Vessel	12	Not selected	

Controller and Auditor General

S/N	Region	Entry point	Means of entry/ departure	Operation hrs	Selection	Reasons for selection
		JNIA	Air	24	Not selected	
6.	Lindi	Kilwa	Road/ Vessel	12	Not selected	
7.	Mtwara	Mtwara seaport	Vessel	12	Not selected	
		Mtwara Airport	Air	12	Not selected	
		Kilambo	Road	12	Not selected	
		Mkunya	Road	12	Not selected	
		Mtambasw ala	Road	12	Not selected	
8	Ruvuma	Mbamba Bay	Vessel	12	Not selected	
		Mkenda	Road	12	Not selected	
09	Mbeya	Kasumulu	Road	12	Selected	Potential and busy entry point for road users in the Southern Highlands zone
		Songwe Internatio nal Airport	Air	24	Not selected	
10.	Katavi	Ikola Port	Vessel	12	Not selected	
		Karema Port	Vessel	12	Not selected	
11.	Rukwa	Wampemb e Port	Vessel	12	Not selected	
		Kipili Port	Vessel	12	Not selected	
		Kirando Port	Vessel	12	Not selected	
		Kabwe Port	Vessel	12	Not selected	
		Mosi	Road	12	Not selected	
		Kasesya	Road	12	Not selected	
		Kasanga	Vessel	12	Not selected	

N/S	Region	Entry point	Means of entry/ departure	Operation hrs	Selection status	Reasons for selection
		Port				
12.	Kigoma	Kigoma port	Vessel	12	Not selected	
		Airport	Air	12	Not selected	
		Kibirizi port	Vessel	12	Not selected	
		Ujiji port	Vessel	12	Not selected	
		Kagunga	Road/ Vessel	12	Not selected	
		Manyovu	Road	12	Not selected	
		Mabamba	Road	12	Not selected	
13.	Kagera	Murusaga mba	Road	12	Not selected	
		Kabanga	Road	12	Not selected	
		Rusumo	Road	14	Not selected	
		Murongo	Road	12	Not selected	
		Bugango	Road	12	Not selected	
		Mtukula	Road	12	Not selected	
		Kanyigo	Road	12	Not selected	
		Ngara airport	Air	12	Not selected	
		Bukoba Airport	Air	12	Not selected	
14.	Mwanza	Mwanza Airport	Air	12	Not selected	
		Mwanza Port	Vessel	12	Not selected	
		Abeid Amani Karume Inter. Airport	Air	24	Not selected	
		Mkoani Se aport	Vessel	12	Not selected	
19.	Tabora	Tabora Airport	Air	12	Not selected	
20.	Shinyanga	Mwadui Airport	Air	12	Not selected	

N/S	Region	Entry point	Means of entry/ departure	Operation hrs	Selection status	Reasons for selection
21.	Dodoma	Dodoma Airport	Air	12	Not selected	
22.	Manyara	Lake Manyara Airport	Air	12	Not selected	
23.	Songwe	Isongole	Road	12	Not selected	
		Tunduma	Road	24	Not selected	

Source: <a href="http://www.immigration.go.tz/index.php/entry-and-exit-point">http://www.immigration.go.tz/index.php/entry-and-exit-point</a>, Accessed on 11<sup>th</sup>
August, 2022 at 12:53 HRS



Appendix 5: Documents Reviewed and Reasons for the Review

Entity	Name of Document	Reason
Vice President's	Monitoring and Evaluation	Evaluate the progress of
Office	Reports	implementing the planned
	Progress Reports	activities and sectoral
		coordination
	Annual Action Plans for	Assessment of the available
	2018/19 to 2021/22	plans to manage the
		Invasive Alien Species in the
		country
	Approved Medium Term	Assessment of the
	Expenditure Framework for	expenditure plans on the
	the year 2018/19 to 2021/22	management of invasive
		Alien Species in the country
	Correspondences Files and	To assess the
	letters related to Invasive	correspondence between
	Alien Species	key actors in the
	S HANKLING	management of Invasive
		Alien Species
	National Invasive Species	Assessment of the available
	Strategic and Action Plan	strategies and plans for the
	(2019 - 2029)	management of Invasive
	National Biodiversity	Alien Species
	Strategy and Action Plan	
Ministry of	(2015-2020)	Evaluate the progress of
Ministry of	Progress Reports	Evaluate the progress of
Agriculture	Strategic Plans	implementing the planned activities and sectoral
	Annual Action Plans	coordination
Ministry of Natural	Strategic Plans	Evaluate the progress of
Resources and	Progress Reports	implementing the planned
Tourism	Annual Action Plans	activities and sectoral
Tourism	Allituat Action Flans	coordination
President's Office	Annual Action Plans for	Evaluate the progress of
Region	2018/19 to 2021/22	implementing the planned
Administration and	Strategic Plans	activities and sectoral
Local Government	Progress Reports	coordination
Tanzania Forest	Approved Medium Term	To find out how the
Service Agency	Expenditure Framework for	Ministries allocate resources

Entity	Name of Document	Reason
(TFS)	the year 2018/19 to 2021/22	to the Management of the invasive alien species.
	Management Plan Forest	To assess the extent
	Reserves in the country	management of invasive
		species in the forest
		reserves
Regional	Correspondences Files and	To assess the
Secretariats	letters related to Invasive	correspondence between
	Alien Species	key actors in the
		management of Invasive Alien Species
TANAPA	Research Reports on Invasive	To review various
	Species	researches conducted on
		the management of Invasive
NCAA		Alien Species
NCAA	Research Reports on Invasive	To review various
	Species	researches conducted on the management of Invasive
		Alien Species
	Ngorongoro Conservation	Evaluate the progress of
	Area Invasive Plants	implementing the planned
	Strategic Management Plan	activities on the
	2019	management of Invasive
		Alien Species
Research Institutes	Annual Action Plans for	Evaluate the progress of
(TAFORI, TPHPA,	2018/19 to 2021/22	implementing the planned
TAWIRI & TARI)		activities and sectoral
	B	coordination
	Research Reports on Invasive	To review various
	Species	researches conducted on the management of Invasive
		Alien Species
Local Government	Annual Action Plans for	Evaluate the progress of
	2018/19 to 2021/22	implementing the planned
		activities and sectoral
		coordination
	Annual Invasion Reports	Assessment of status of
		Invasion in the country

Entity	Name of Document	Reason
Ports of Entry	Inspection Reports	To assess the effectiveness of control mechanism against invasive species at the ports of entry

Source: Auditors' Analysis from the Reviewed Documents (2022)



## Appendix 6: Officials Interviewed and Reasons for their Interviews

This part presents the list of officials that were interviewed during the audit and reasons for their interviews.

Entity	Interviewee	Reasons
VPO- Environment	Director of Environment     Head of the Biodiversity Conservations Section     Officers from Biodiversity Conservations Section  Officers from Biodiversity Conservations Section	<ul> <li>To get information about coordination in ensuring adequate management of the invasive alien species.</li> <li>To get information about monitoring the performance of other sectorial ministries.</li> </ul>
Ministry of Agriculture (MoA)	Director of Environmental Compliance and Enforcement     TPHPA Director     Agricultural officers /Specialist on invasive species	<ul> <li>To understand the efforts made in the implementation of the management of the invasive alien species.</li> <li>To understand the challenges and their causes.</li> <li>To get the information concerning various research activities conducted related to the Management of the invasive alien species.</li> <li>To understand any other involvement of research institutes in Management of the invasive alien species.</li> <li>To get confirmation of information obtained from reviewed documents.</li> </ul>
Ministry of the Natural Resource and Tourism	<ul> <li>Director of Wildlife and Tourism Division</li> <li>Commissioners of TANAPA and NCAA</li> <li>Head of Sections related to the management of the invasive alien species</li> </ul>	<ul> <li>To understand the efforts made in the implementation of the Management of the invasive alien species.</li> <li>To understand the challenges and their causes</li> <li>To get confirmation of information obtained from reviewed documents.</li> </ul>
At Entry	• TPHPA entry point	• To understand the ways inspectors,

Entity	Interviewee	Reasons
points (Namanga, Sirari, , Kilimanjaro International Airport, Kasumulu)	inspectors	control the importation and exportation of plants and plant related materials in the country through entry points.  To understand the procedures of importing and exporting pest free consignment.  To understand challenges faced by inspectors at entry points since the entry points are the first line of defence  To get confirmation of information obtained from reviewed documents.

Source: Auditors' Analysis on the List of Interview Officials (2022)



## Appendix 7: Status of the Availability of Inspectors at the Ports Entry

This part presents the status of the availability of inspectors at the Ports of Entry in the country

Category of Point of entry	Name of point of entry	Status of availability of TPHPA inspector at the point of entry [YES] or [NO]
	Dar es Salaam International Airport	YES
Airport	Kilimanjaro International Airport	YES
	Mwanza Airport	YES
	Bukoba Airport	YES
	Songwe Airport	YES
	Dar es Salaam Harbour	YES
	Tanga Harbour	YES
	Mtwara Harbour	YES
	Bukoba P <mark>ort</mark>	YES
Harbours	Mwanza Port	YES
Tiai bours	Kigoma Port	YES
	Musoma Port	YES
	Mbamba bay Port	NO
	Itungi Port	NO
	Lindi Port	NO
	Namanga	YES
	Tunduma	YES
	Sirari	YES
	Mutukula	YES
	Rusumo	YES
Overland border	Tarakea	YES
entry points	Horohoro	YES
	Holili	YES
	Kasumulo	YES
	Mtambaswala	YES
	Kasesya	YES
	Kasumulu	YES

Category of Point of entry	Name of point of entry	Status of availability of TPHPA inspector at the point of entry [YES] or [NO]
	Kabwe	YES
	Kilando	YES
	Kabanga	YES
	Murusagamba	YES
	Manyovu	YES
	Murongo	YES
	Mabamba	YES
	Mpulungu	NO
	Kibondo	NO
	Isongola	NO
	Kalema	NO
	Makambe 1077	NO
	Mkomazi	NO

**Source**: Analysis of the status of the availability of inspectors at the Ports of Entry in the country by Auditors, 2022

## Appendix 8: Status of Equipment that are Available at the Ports of Entry

This part provides the status of equipment that are currently available at different Ports of entry in the country

		Status	of po	orts of	entry
Category of Equipment	Equipment	Namanga	Sirari	KIA	Kasumulo
	Overcoat/overall		Ok		
Protective gears	Pair of gloves		Ok		
	Hard hat		Ok		
	aspirator/mask		Ok		
	Safety googles		Ok		
	Binocular microscope	Ok	Ok	Ok	
	An inspection translucent table with a good overhead and underneath lighting system		Ok		
	Good lighting	Ok	Ok	Ok	
	Magnifying lens/handling lens		Ok	Ok	
	Pocket knife	Ok	Ok	Ok	
	Vials for collecting insect pests	Ok	Ok	Ok	
	Tweezers and forceps pick insects and infected plant parts	Ok	Ok	Ok	
	Absorbent papers				
Working	Fine camel brush to rub out mites, eggs and thrips, etc				
Tool	Pest list and identification manual or identification pictorial guides of common pests as reference materials				
	Labels, tags, staplers with pins, plastic bags, heavy duty trash bags, pens, marker pens, pencils, notebooks, masking tape	Ok	Ok	Ok	
	Digital camera/Notepad	Ok	Ok	Ok	
	Gas detectors for specified fumigants				
	Mask pertinent/specific to fumigants e.g. methyl bromide, aluminium phosphite, magnesium phosphate				
	Sampling jars/kilner jars/bags/petri dishes/trays		Ok		