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CAMEROON BIOSECURITY PROJECT

Development and Institution of a National Monitoring and Control System (Framework) for Living Modified Organisms (LMOs) and Invasive Alien Species (IAS)

MANUAL ON INVASIVE SPECIES CONTROL SYSTEMS AND PROCEDURES IN CAMEROON

This manual has been produced with the support of UNEP/ GEF and the Government of Cameroon via the Ministry of Environment, Protection of Nature and Sustainable Development.

Under the Supervision of:

Project Component Two Taskforce (MINADER)

&

The Biosecurity Project Coordination Unit

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Ministère de l'Agriculture et du Développement Rural

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Acronyms and Abbreviations

ABC	Abstinence, Be Faithful, Use A Condom
AFP	Acute Flaccid Paralysis
AIDS	Acquired Immune Deficiency Syndrome
AIS	Alien and Invasive Species (used in the context of the South African Alien And Invasive Species (AIS) Regulations)
ASFV	African Swine Fever Virus
AWIPM	Area-Wide Integrated Pest Management
BBC	British Broadcasting Corporation
Bt	*Bacillus thuringiensis*
CABI	Centre for Agriculture and Biosciences International
CARBAP	Centre de Recherches sur Bananiers et Plantains
CBD	Convention on Biological Diversity
CBP	Cameroon Biosecurity Project
CDC	Centers for Disease Control and Prevention
CDC	Cameroon Development Corporation
CDFA	California Department of Food and Agriculture
CIRAD	Centre de Coopération Internationale en Recherche Agronomique pour Le Développement
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMD	Cassava Mosaic Disease
CNN	Condoms, Needles, and Negotiation
CTV	Citrus Tristeza Virus
DDT	Dichloro-diphenyl-trichloroethane
DPMH	Direction de la Pharmacie du Medicament
DVM	Disease Vector Management
EBV	Estimated Breeding Value
EACMV-UG	East African Cassava Mosaic Virus-Uganda
FAO	Food and Agriculture Organisation
FCFA	Franc de la Cooperation Financiere en Afrique (Central African Franc)
FFV	Fresh Fruit and Vegetables
FHIA	Fundación Hondureña de Investigación Agricola

GDP	Gross Domestic Product
GEF	Global Environment Facility
GWD	Guinea-worm Disease
HAART	Highly Active Antiretroviral Therapy
HIV	Human Immunodeficiency Virus
HPR	Host-Plant Resistance
I3N	IABIN Invasiveness Information Network
IABIN	Inter-American Biodiversity Information Network
IAS	Invasive Alien Species
IFG	Inducible Fatality Genes
IITA	International Institute of Tropical Agriculture
IPC	Integrated Pest Control
IPM	Integrated Pest Management
IPV	Inactivated Poliovirus Vaccine
IRAD	Institute of Agricultural Research for Development
ISSG	Invasive Species Specialist Group
IUCN	International Union for the Conservation of Nature
LDPE	Low-density polyethylene
LMO	Living Modified Organism
MAT	Male Annihilation Technique
MEAM1	Middle East-Asia Minor 1 Species
MINADER	Ministry of Agriculture and Rural Development
MINEPDED	Ministry of Environment, Protection of Nature and Sustainable Development
MINEPIA	Ministry of Livestock, Fisheries and Animal Industries
MINFOF	Ministry of Forestry and Wildlife
MINRESI	Ministry of Scientific Research and Innovation
MINSANTE	Ministry of Public Health
MSMA	Monosodium Methanearsonate
MTB	*Mycobacterium tuberculosis*
NKWE	Neem Kernel Water Extract
NWS	New World Screwworm
OIE	World Organisation for Animal Health

OPV	Oral Polio Vaccine
PAHO	Pan American Health Organization
PIER	Pacific Island Ecosystems at Risk
PROTA	Plant Resources of Tropical Africa
RNA	Ribonucleic acid
RTD	Rice Tungro Disease
SARS	Severe Acute Respiratory Syndrome
SIDA	Syndrome d'immunodéficience acquise (AIDS in English)
SIT	Sterile Insect Technique
SIV	Simian Immunodeficiency Virus
SPVD	Sweet Potato Virus Disease
SSA	Sub-Saharan Africa
SSC	IUCN Species Survival Commission
SVCV	Spring Viraemia of Carp Virus
TB	Tuberculosis
TIR	Thermal-Infrared-Retentive
UC	University of California
UNAIDS	Joint United Nations Programme on HIV and AIDS
UNEP	United Nations Environment Programme
UNICEF	United Nations Children's Fund
UNVDA	Upper Nun Valley Development Authority
WCA	West and Central Africa
WHO	World Health Organisation
WSSV	White Spot Syndrome Virus

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Executive Summary

Purpose (context and justification)

The Project Objective of the UNEP/GEF funded Cameroon Biosecurity Project (*Development and Institution of a National Monitoring and Control System (Framework) for Living Modified Organisms (LMOs) and Invasive Alien Species (IAS)*) being executed by MINEPDED is to Increase capacity to prevent and control the introduction, establishment and spread of Invasive Alien Species (IAS) and management of LMOs in Cameroon through the implementation of a risk-based decision making process.

Within this context of a risk-based biosecurity approach the project advocates using the 'invasive management hierarchy' when planning the management of biological invasions[1]. This concept states that prevention is better than early detection and rapid response, which is better than eradication, which is better than control and mitigation. Within this management hierarchy, there are a wide range of management methods available some of which have been used in Cameroon.

This manual provides a "one-stop shop" for accessing information on management methods available for a range of prominent biological invaders known to be present in Cameroon.

Objective

To produce a short and easy to use manual (in modules) to guide decision-makers on the most appropriate control and management measures to use for established biological invaders, including any LMOs that may become invasive, in their management context.

Methodology

The work was primarily desk-based. A point of departure was the project report on the impact of biological invasions in Cameroon which outlined management methods and the report on an invasive species list for Cameroon which established the species to be considered in this manual. Using these information sources and the international literature, a manual was drafted which was reviewed by national experts who helped to ensure that the examples used were appropriate for

[1] To date, there have been no reported instances of a GMO becoming invasive in Cameroon or elsewhere so the focus will be on non-GMOs. However, the potential of GMOs to become invasive and the need to minimise this risk will be emphasised in the manual.

the Cameroonian context. These experts also provided further information which was used to redraft the manual.

Results

The manual has been divided into the following modules:

1) An introduction to biological invasions in Cameroon
2) An Introduction to a systems approach to the management of biological invasions
3) Generic biological invasion management approaches
4) Management approaches for invertebrate plant pests
5) Management approaches for plant diseases
6) Management approaches for invasive plants
7) Management approaches for invasive animals
8) Management approaches for animal and human diseases

Each module is accompanied by a series of questions to enable end-users to understand the concept within each module and how to apply it.

The manual on IAS management approaches, comprises of an introductory section in which the rationale for the use of a 'systems approach' to the management of biological invasions is outlined. A systems approach considers the target species or groups of species in the context of the system of which it is a part. This system comprises of the interaction of natural and human systems that together determine the impact of a biological invader and the possible management approaches that can be used singly or in combination as part of an integrated approach to management. Such an approach, which uses a situationally specific management approaches is known as "integrated pest management", the "ecosystem approach" and the "one health" approach in the agriculture, biodiversity conservation and health sectors respectively.

The tools that can be used as part of a systems approach comprise of the range of management interventions that are available for the management of biological invasions. These are outlined in the section on management tools.

Tools available are outlined generically and then per specific taxonomic groups. The taxa chosen were selected to cover the range of those that are listed as invasive species in the project report - List of major invasive species in Cameroon (Project Activity 4.3.1.) in terms of taxonomic representativeness, type of impact, types of management approaches implemented and priority in Cameroon.