CAMEROON BIOSECURITY PROJECT

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

QUANTIFICATION OF END OF PROJECT KNOWLEDGE LEVELS CONCERNING BIOLOGICAL INVASIONS AND LMOs IN CAMEROON

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Under the Supervision of :

Project Component 4 Taskforce (MINRESI)

&

Biosecurity Project Coordination Unit (MINEPDED)

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ACRONYMS AND ABBREVIATIONS

Abbreviation	Full Name
ANOVA	Analysis of variance
ASFV	African Swine fever virus
Bt	Bacillus thuringiensis
CAG	Component Advisory groups
CAS	Cameroon Academy of Sciences
CBD	Convention on Biological Diversity
CBP	Cameroon biosecurity project
CIDE	Centre pour information et documentation sur l'environnement
COP	Conference of Parties
CPB	Cartagena protocol on Biosafety
DRCQ	Department of Regulation and Quality Control of Agricultural Products and Inputs
FAO	Food and Agricultural Organisation
GEF	Global Environment Facility
GEM	General Elimination Methodology
GM	Genetically modified (genetic modification)
GMOs	Genetically modified organisms
IAS	Invasive alien species
IUCN	International Union for Conservation of Nature
KAP	Knowledge, Attitude and Practice
LANAVET	National Veterinary Laboratory
LMO	Living modified organisms
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
MINESUP	Ministry of Higher Education
MINRESI	Ministry of Scientific research and Innovation
MS	Microsoft
NBC	National Biosafety Committee
NGO	Non-Governmental Organisation
NPC	National Project Consultants
OH	Outcome Harvesting
PAC	Project Advisory Committee
PCR	Polymerase Chain Reaction
PCU	Project Coordination Unit
PRA	Participatory Rural Appraisal

Abbreviation	Full Name
PTA	Project Technical Advisers
SODEPA	Livestock Development Corporation (acronym in French)
ToT	Training of Trainers
TV	Television
UNEP	United Nations Environment programme
USA	United States of America

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EXECUTIVE SUMMARY

CONTEXT AND JUSTIFICATION

This consultancy is executed as Activity D3 under Component 4 on Information and Awareness under the UNEP-GEF Cameroon Biosecurity Project (CBP). The CBP aims 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.

The consultancy assignment is to *Quantify End of Project Personnel Knowledge and Attitudes Concerning Biological Invasions and LMOs in Cameroon*. It builds upon the work undertaken under Component 4 - *Quantification of Baseline Knowledge and Attitudes concerning Biological Invasions in Cameroon* (Activity 4.1.1. /D1) and *Quantification of Mid-Project Knowledge Levels Concerning Biological Invasions and LMOs In Cameroon* (Activity 4.1.2. /D2).

The Key Concepts surrounding this activity are invasive species and LMOs. The project working definition of an "**invasive species**" is: *A species of any taxa from any provenance that moves beyond its intended location and causes a negative impact: somewhere but not necessarily everywhere; at some point in time, but not necessarily always; and according to some people but not necessarily everyone.*

A living modified organism (LMO) is defined in Article 3 of the Cartagena Protocol on Biosafety (CPB) as *any living organism that possesses a novel combination of genetic material obtained through the use of modern biotechnology*.

Objective of the activity is:

- To produce and execute a relevant, replicable and easy to analyse survey protocol to assess the prevailing knowledge and understanding of major stakeholders about issues of relevance to the causes, consequences and management approaches for biological invasions in Cameroon.

METHODS

The Survey Respondents were key CBP stakeholders who have been involved in project activities, comprising members of the Project Coordination Unit; Project Technical Advisors[i]; National Biosafety Committee; National Project Consultants; Component Task Teams; Project Advisory Committee; and, Component Advisory Group, totalling 36 respondents.

Customisation of the 2016 Questionnaire: The survey was customised to reduce its length and increase its clarity. The questionnaire was divided into 3 major sections: 1) knowledge/awareness covering relevant terms, information sources, invasive species, causes and management approaches of biological invasions; 2) attitudes/concerns towards biological invasions, GMOs, biological invasion management approaches and reasons for managing biological invasions; and 3) practice- responsibility for the management of biological invasions, and, actions undertaken by respondents to manage biological invasions. An additional element was added to assess behavioural change outcomes to which the CBP has contributed using a well-established technique called Outcome Harvesting (OH). OH is inspired by the definition of 'outcome' in Outcome Mapping, namely: observable changes in the behaviour, relationships, activities and actions of those individuals, groups or organisations ('social actors') with whom a project or programme interacts and works with directly to affect change.

Questionnaire administration was carried out on the 1st December 2017 and individually to the respondents who could not attend the meeting. The consultants explained in a ten-minute introductory talk, the survey background, objectives and instructions on the format of the survey to participants who individually completed the questionnaire between 45 minutes and one and a half hours. Data was entered into an MS Excel spreadsheet and following the results from analysed statistics, a first Draft Report was prepared and submitted to Component 4 Task Team on 29th April 2018. Following review by Task Team, corrections were incorporated and a final report was submitted on 6th June 2018.

RESULTS

For the purpose of this survey, knowledge of terms was used to provide a surrogate index of knowledge and awareness. Perceived knowledge levels were disaggregated by gender, age, education level and project function category (Project Coordination Unit and PTAs, Component heads, support staff and national consultants, and PAC members and resource persons). There were no statistically significant differences in the overall perceived knowledge levels of men and women. No analysis was performed on differences between perceived

[i] Only one of the two PTAs was involved as a respondent as the other (John Mauremootoo) was the international consultant for this activity.

knowledge levels and age group and education as there was not a large enough range of values for age and education. There were no statistically significant differences in the perceived knowledge levels of the different functional categories. This was a major change from 2016 when there were statistically significantly higher perceived knowledge levels, with PCU and PTAs scoring higher than component heads, support staff and national consultants, who in turn scored higher than PAC members and resource persons. This change reflected an overall levelling out of results with a much lower range of scores than in 2016. These results, however, must be interpreted with caution as only seven individuals completed the written definitions section so the perceptions may not necessarily conform to reality. Indeed, those who defined terms scored lower than their perceived knowledge levels but the degree of congruity between the self-assessments and the definitions was higher in 2017 than in 2016.

Information sources on biological invasions: People were aware of more media sources of information relating to biological invasions in 2017 than in 2016 but the increase was not huge.

Knowledge of invasive species: There was an increase in people's ability to list biological invaders between 2016 and 2017. However, the spread of responses was very large with two individuals unable to list any species. The large majority of the species listed could be legitimately defined as biological invaders. Some of the entities listed were highly generic (birds, insects, etc.) and had no explanatory value. There was very little outright inaccuracy in the responses with cotton being a notable exception.

Knowledge of the causes of biological invasions: There was an increase in people's ability to list biological invasion causes between 2016 and 2017. The spread of responses was very large with two individuals unable to correctly list any causes and only two correctly identifying ten causes of biological invasions.

Knowledge of biological invasions management approaches: There was a small increase in people's ability to list biological invasions management approaches between 2016 and 2017. The management approaches listed in 2017 were more specific than those listed in 2016. Once again, the spread of responses was very large with six individuals unable to list any management approaches and four correctly listing ten biological invasions management approaches. Most of the responses given could be legitimately defined as biological invasions management approaches although some causes listed were somewhat generalised, e.g. education and training and planning. There were some misapprehensions which are indicative of a superficial understanding of biological invasions management approaches.

ATTITUDES CONCERNING BIOLOGICAL INVASIONS

There was a slight increase in overall concern of respondents. They were more concerned about biological invasions in 2017 than they had been in 2016 but the changes in all but one case not statistically significant. The exception was the statement that: *In the coming years an increase in biological invasions will result in the loss of many of Cameroon's native species* which was statistically significantly higher in 2017 than in 2016.

Reasons for managing biological invasions: Respondents mostly supported statements relating to reasons for managing biological invasions and this support increased marginally but not in a statistically significant manner between 2016 and 2017. The strongest support came for managing biological invasions to protect livestock, crops and human health followed by support for managing invasions that damage infrastructure and habitats. Support for managing biological invasions to protect buildings and infrastructure was weaker and there was no overall support for managing biological invasions for reasons of human safety and to enable new developments to take place.

***Attitudes towards biological invasions management approaches*:** Respondents largely agreed that man should manage biological invasions and should not leave nature to take its own course and that there is a need for rules and regulations about the methods used to manage biological invasions. When considering whether or not to take steps to control particular types of species respondents were more comfortable with controlling (non-bird) animal and plant pests and farm animals than dogs or cats.

Responsibility for the management of biological invasions: Respondents, for the most part appreciated that they had a personal responsibility to help to manage biological invasions. The changes between 2016 and 2017 were small but they did appear to indicate a slight shift in importance with relevant government agencies being perceived as being relatively more important in 2017.

BEHAVIOUR CHANGE CONCERNING BIOLOGICAL INVASIONS

There were positive trends for biological invasions management practices to which the CBP has substantially contributed. Individuals have personally implemented biosecurity measures such as not moving living organisms from place to place, increasingly complying with biosecurity legal measures and good practice, and informing people within their circle of influence of the importance of biological invasions and the need to enforce strict biosecurity measures. There has also been an increased implementation of officially mandated biosecurity measures and improved management strategies that were influenced by CBP outputs. The CBP activities involving the compilation of invasive species lists have proved to

be the basis for the ongoing updating of these lists by specialists in Cameroon and the project's activities have contributed to an increased number of projects being undertaken in the area of biological invasions.

This is an impressive set of results but conclusions about the ultimate success of the project in improving biosecurity impacts must be cautious given the observations of several respondents that these changes are unlikely to have trickled down very far in Cameroonian society, and even possibly within the CBP implementing organisations.

When outlining actions taken to manage biological invasions in Cameroon, most responses concerned communication/awareness-raising/capacity building actions. This is very important work. However, the low level of responses relating to actions on the ground indicate that actions to manage biological invasions in Cameroon are still at a very early stage.

ATTITUDES CONCERNING GMOS

Questions were framed to assess respondents' attitudes- negative or affirmative- with regards to the use of GMOs in Cameroon, including use of GM seed and GM animal to improve agricultural productivity, as well as consumption of food items derived from GMOs.

Attitude to the use of GMOs in Cameroon

There has been an appreciable increase in the proportion of respondents in favour of the use of GMOs in Cameroon in 2017 compared to 2016. This is mainly attributable to a shift from those who were previously unsure while the total of those against their use in Cameroon has fallen, but only slightly.

Attitudes to the use of GM seed to improve agricultural productivity

The results reflect the shift towards being more in favour of the use of GMOs in Cameroon as outlined in the previous section. Once again, there is, in this case slight, movement from those who are not sure to being in favour. However, the results indicate a lack of deep thought about the issue on the part of some respondents as the numbers in favour of using GMO seeds in Cameroon is higher than the number of respondent who are in favour of the use of GMOs in Cameroon. The former category is a subset of the latter and therefore, logically should provide greater or equal numbers of responses.

Attitudes to the use of GM animals to improve agricultural productivity

The results reflect the shift towards being more in favour of the use of GMOs in Cameroon as outlined in the previous sections though there is proportionally fewer respondents in favour of the use of GMO animals to improve agricultural productivity than overall use of GM technology or the use of GM seeds.

Attitudes to the use of GM animals to improve agricultural productivity

The results reflect the shift towards being more in favour of the use of GMOs in Cameroon as outlined in the previous sections though there is proportionally fewer respondents in favour of the use of GMO animals to improve agricultural productivity than overall use of GM technology or the use of GM seeds.

Attitudes to consuming food derived from GMOs

The results reflect the shift towards being more in favour of consuming food derived from GMOs in 2017 than in 2016 which parallel the increase in positive attitude towards the use of GMOs in Cameroon as outlined in the previous sections. However, there are proportionally fewer respondents in favour of the consumption of GMO-derived food than the use of GM technology per se and the use of GM seed but a more positive attitude than towards the use of GM animals to improve agricultural productivity.

BEHAVIOUR CHANGE CONCERNING GMOs

Five outcomes related directly to the testing of Bt cotton and the role that the CBP had in helping to facilitate this process. Most were positive in terms of approval of trials and access to information. However, concern was also expressed about the lack of transparency of the process. There was some increased checking of food labels by those concerned about the negative effects of GMOs. A highly significant outcome for the project was the formulation of a GMO policy framework. The increased acceptance of GMOs was related in terms of behavioural change, for example, “senior government officials (Ministers, etc) no longer talk against GMOs.” This is reflected in the outcomes relating to the Prime Minister’s declaration that controlled GMO introduction could take place on a case by case basis. Thirteen of the 16 knowledge/attitude changes concerning GMOs (81%) related to an increased acceptance of GMOs as being potentially useful if introduced under a strict regulatory regime.

DISCUSSION

Encouragingly, many individuals displayed a thorough knowledge of biological invasions but there was a remarkable disparity between those with a day to day involvement in the CBP activities who tended to have the highest levels of knowledge compared to the performance of the other respondents. This disparity in the results in terms of knowledge level with some individuals showing very low levels of knowledge, as well as the variance between people’s perceived and actual knowledge levels of key terms is a cause for concern.

The attitudes towards the management of biological invasions were positive in most cases which shows that respondents’ philosophies on biological invasions management were broadly aligned with each other. This alignment helps when it comes to communication, policy and on the ground actions that centre on a risk-based approach to the management of

biological invasions. However, knowledge and awareness levels need to be deepened beyond those relatively few highly knowledgeable individuals if the stakeholders surveyed are to become effective ambassadors for biological invasions management in Cameroon. There were positive trends for biological invasions knowledge, management and practice from 2011 to 2016. However, the fact that the changes are unlikely to have trickled down very far in Cameroonian society, and even possibly within the CBP implementing organisations, is a cause for concern.

Possible next steps to maximise the utility of this study

A thorough orientation of key stakeholders on GMO through training is recommended; with the modules covering biosafety, risks and benefits of modern biotechnology, risk analysis of GMOs, and public awareness, consultation and participation.

Specific steps to follow up this survey

It is strongly recommended that a survey of this kind is undertaken at the beginning of any follow-up project to ensure that the project implementation team is aware of prevailing knowledge, attitude and practice (KAP) levels among the key stakeholders as a prelude to capacity building work to ensure a sound foundation for future efforts. The questionnaire has been simplified by making most questions multiple choice.

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