



## 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 BASELINE KNOWLEDGE AND ATTITUDES CONCERNING BIOLOGICAL INVASIONS IN CAMEROON

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&

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## Acronyms and abbreviations

Abbreviation	Full Name
ANOVA	Analysis of variance
APHIS	Animal and Plant Health Inspection Service (USA)
ASF	African swine fever virus
CBD	Convention on Biological Diversity
CHM	Clearing House Mechanism
COP	Conference of Parties
CS	Communication strategy
FAO	Food and Agriculture Organization of the United Nations
GEF	Global Environment Facility
GMO	Genetically modified organism
IAS	Invasive Alien Species
IPPC	International Plant Protection Convention
IFAD	International Fund for Agricultural Development
IRAD	Institute of Agricultural Research for Development
IUCN	International Union for the Conservation of Nature (World Conservation Union)
JM	John Mauremootoo
KAP	knowledge, attitude, practice
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
MINFOF	Ministry of Forestry and Wildlife
MINRESI	Ministry of Scientific Research and Innovation
MINSANTE	Ministry of Public Health
MP	Member of Parliament
N.S.	Not statistically significant
nBCH	National Biosafety Clearing House
NBSAP	National Biodiversity Strategy and Action Plan
SEMRY	Society for the Expansion and Modernization of Rice in Yagova (Cameroon)
STD	Sexually transmitted disease
ToT	Training of trainers
TT	Task Team
UNEP	United Nations Environment Programme
$\chi^2$	Chi-square

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# Executive Summary

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This study was undertaken to establish the baseline knowledge level and raise awareness of major stakeholders in the causes and consequences of, as well as management approaches to biological invasions and LMOs in Cameroon.

A draft questionnaire to assess biological invasions awareness levels, including a section on awareness of and attitudes towards LMOs and GMOs, was formulated, tested on a group of participants in a training of trainers (ToT) workshop on biological invasions. The questionnaire was then amended after preliminary data analysis, comments from ToT respondents as well as suggestions from the Component 4 (information and awareness) Task Team.

This reformulated questionnaire was administered to respondents at a series of group survey meetings from 19 July to 16 August 2012. Data were collected on sample demographics (institution, age, gender, etc.), knowledge/awareness and attitude/concern. The specific variables measured are presented below:

- On KNOWLEDGE/AWARENESS
  - Knowledge of terms
  - Biological Invasions compared with other biodiversity threats
  - Information sources
  - Knowledge of and ability to identify invasive species
  - Awareness of approaches that can be used to manage biological invasions
  - Awareness of the causes of biological invasions
- On ATTITUDE/CONCERN
  - Attitudes toward biological invasions
  - Attitude toward GMOs/LMOs
- Reasons for managing biological invasions
- Attitudes toward biological invasion management approaches
- Responsibility for managing biological invasions

The surveyed groups, selected to represent as wide a range of biological invasions stakeholders as possible are listed below:

- 1) Concessionaries (forest concession holders)
- 2) Customs services
- 3) Independent observers (e.g. international organisations working in Cameroon on specific issues)
- 4) International Non-Governmental Development Organisations
- 5) Lions Club
- 6) MINADER (Ministry of Agriculture and Rural Development)
- 7) MINEPDED (Ministry of Environment, Protection of Nature and Sustainable Development)

- 8) MINEPIA (Ministry of Livestock, Fisheries and Animal Industries)
- 9) MINFOF (Ministry of Forestry and Wildlife)
- 10) MINSANTE (Ministry of Public Health)
- 11) Rotary Club
- 12) Urban Farmer Groups

The groups surveyed, a relatively well-educated individuals of working-age, most of whom lived in urban areas, were chosen because of the resource constraint although not a representative sample of the population of Cameroon in terms of age, education, rurality, socio-economic grouping or occupation.

The group survey meetings had the following format: An introductory talk on biological invasions, GMOs and LMOs; the statement of objectives and activities of the Cameroon Biosecurity Project and details of how the survey would be conducted; the administration of the baseline survey questionnaire; an awareness-raising session comprising a PowerPoint presentation on biological invasions in Cameroon, GMOs and LMOs; a question and answer session and distribution of project awareness-raising resources.

A total of 310 individuals completed the baseline questionnaire and 232 of these filled in the follow-up questionnaire. The data was entered into an MS Excel 2010 database for the data analysis and report writing.

### **Knowledge of Biological invasions and Awareness raising**

The overall findings showed that the knowledge baseline is greater than zero. There was a degree of awareness of relevant terms but over 75% of the respondents felt that they could not define them and many of those who did attempt to define them found it difficult (only about 10% of those definitions were accurate).

Respondents perceived biological invasions to be a serious threat to biodiversity and livelihoods, though the perceived level of threat derived from this survey was relatively high because of the focus of this exercise.

The numbers who had heard of biological invasions in their area (about 60%) rose to about 80% after the awareness-raising session. This indicated that many people were actually quite aware of biological invasions but considered them as specific pest, weed and disease issues (e.g. *Striga* in maize, ASF in pigs, etc.) and not as examples of a more general phenomenon.

Some of the increased levels of awareness were directly due to the information given during the awareness-raising session that followed the baseline survey. This aspect of the work was widely appreciated, had a positive effect on understanding, and helped to jump-start the awareness-raising aspect of the Cameroon Biosecurity Project.

The range of media coverage that provided respondents with information relating to biological invasions reinforced the fact that this group was not a random sample of

the Cameroon population. However, even with this caveat permanently in mind, it appears that issues relating to biological invasions are under-represented in the mainstream media in Cameroon.

Only 52% of the respondents in the baseline survey could list some invasive species; 35% did not list invasive species. The number who stated that they could list some invasive species rose to 86% in the follow-up although many had problems in naming species precisely.

53% of respondents could identify causes of biological invasions in the baseline survey; 42% did not list causes of biological invasions. The number who stated that they could identify causes of biological invasions rose to 79% in the follow-up.

The list of causes derived from this survey appeared very comprehensive, but in reality each list was limited. However, the results illustrated that the collective knowledge of the individuals surveyed was considerable and that if synergies are maximised there would be potential for effective action.

Many of the causes listed concerned local movement and movement between neighbouring countries. This internal or cross-border movement is no doubt a factor but very difficult to manage. A risk-based approach to biosecurity prioritises key pathways that can help to focus activities on the points of highest risk and maximise the chances of success. These local pathways are unlikely to be a priority in the short-term under such an approach.

When listing causes of biological invasions, many of the respondents focused on characteristics of the recipient environment. This understanding of the importance of ecosystem health by many respondents bodes well for sustainable management.

Many respondents gave unclear responses in their listing of biological invasions management approaches. However, as observed above, there was a collective knowledge of the approaches 'toolbox' that can provide the mix of approaches needed for managing biological invasions in any specific context.

Respondent data was disaggregated by gender, age, education level and occupation for preliminary data analysis. No distinct trends were found in the gender and occupation data so the only disaggregated data used in subsequent analysis was age and education. There were generally positive correlations between age, education level and perceived knowledge levels and the various aspects of knowledge and awareness investigated. Age appeared to be quite a good base for experience but education was a much more consistent predictor of higher levels of knowledge and awareness.

A new category was derived from the knowledge data – 'above and below average perceived knowledge of terms'. This divided the group in two halves – those with total scores for knowledge of terms above the median value and those with total scores for knowledge of terms below the median value. This was used to determine



the extent to which knowledge was a contributing factor to the attitude and practice parameters.

The very encouraging finding was that knowledge gaps often closed up between the baseline and follow-up surveys indicating that a concerted awareness-raising programme can be quick and effective. Of course, the real test would be to administer the survey again several months or even years after baseline.

### **Attitudes concerning biological invasions**

This section provided some very useful findings which indicated that attitudes are not always supportive to the management of biological invasions in Cameroon. Relatively low and inconsistent scores for some of the statements of concern could indicate several things – a lack of concern, lack of empowerment or confusion for example.

When asked to indicate the extent to which they agreed with statements relating to reasons for managing biological invasions, responses were similarly equivocal to those in the concerned section. There was surprisingly a small difference between the scores for the lists of reasons given. Average scores increased consistently in the follow-up but still showed values close to the median (*neither agree nor disagree/don't know category*).

The set of results in the section relating to attitudes towards biological invasion management approaches was extremely interesting. Once again, overall results averaged around the median category. However, those statements that suggested the killing of any life form, even plants, as part of a biological invasion management strategy scored consistently lower than the other statements. This valuable finding makes it very clear that there is an issue when it comes to management approaches that are thought to be unacceptable. It highlights the imperative for meaningful stakeholder engagement when planning interventions to manage biological invasions.

Once again, education positively correlated with most scores. However, the pattern of lower scores in the statements that related to killing was a little stronger among the more highly-educated than in the other groups. This indicated that moral and ethical issues are concerns across all strata and clearly should be taken into consideration when planning any interventions that prioritise one species or group of species above others.

### **Attitudes towards LMOs and GMOs**

There was a specific section in the questionnaire that related to LMOs and GMOs; nevertheless, a low level but regular number of comments about LMOs and GMOs were consistently given in many of the other sections that were not specifically focused on LMOs and GMOs. A few respondents equated LMOs with IAS while others felt so passionately about the issue that they used any available opportunity to voice their concerns.

Despite these consistently anti-LMO/GMO comments in other sections, 57% of comments in the LMO/GMO section were in favour of their use in Cameroon, 34% were against and 8% neutral. The very forceful nature of comments on either side of the debate reflects the controversy over the issue. There was a relationship with educational level; those having a higher level of education were broadly supportive of LMOs/GMOs.

The controversy over the issue has implications for the Cameroon Biosecurity Project which aims to facilitate a risk-based approach to assessing the suitability of any planned species introduction into Cameroon (LMO or non-LMO). The project must work to communicate the rationale for this approach which is preferable to clandestine introductions under which there is no regulation.

A second implication is that the conflation of LMOs, GMOs and invasive species creates a lot of confusion for many people. Those working on the project need to explain very clearly that LMOs and IAS are not a single group.

### **Biological invasion management practices**

The diverse range of responses to the question about who was responsible for managing biological invasions reflects the cross-cutting nature of the issue. The fact that many of those who responded mentioned that they had a personal responsibility to manage biological invasions is a cause for optimism. These responses are a reminder that the Cameroon Biosecurity Project can only work if it is a truly multi-stakeholder project.

Very few respondents listed actions that they had personally taken to manage biological invasions. This may reflect either a lack of involvement in this domain or that people did things but do not consider them as representing biological invasions management. The latter reflects what appears to be a disconnection between knowledge, attitude and practice. This disconnection might account for some of the responses given in the attitude section.

### **Implications of this study for the Biosecurity Project Communications Strategy (CS)**

This study provided invaluable information which will be fed into the Biosecurity Project Communication Strategy. The following relevant points for consideration were listed:

- This survey demonstrated that there is a great deal of confusion surrounding both the subject matter – biological invasions and biosecurity, and the project itself. The CS, articulated around some very clear communications objectives, will enhance shared understanding and buy-in.
- Terminology continues to be used confusedly. Key terms need to be defined simply and clearly.

- Knowledge is not enough – perceptions are critical. The communication strategy must address the issue of how best the project can engage the key stakeholders without whom effective biosecurity in Cameroon cannot function.
- Biological invasions are such a vast subject that it is easy to try to do a little bit of everything and end up doing nothing. It is essential to focus communication activities on key media messages.
- Awareness needs to be integrated into all project components. Every project activity should be an awareness-raising opportunity.
- Focus on success. Many successes have been registered in the management of biological invasions – from successfully controlling the cassava mealybug to securing Cameroon’s rubber industry by applying good biosecurity principles to the work underway to reverse the invasion of bracken fern in Tadu. The use of case studies such as these empowers instead of inhibits.

### **Maximising the utility of this study**

This study, from every evidence so far, is the most thorough research in biological invasions and attitudes undertaken in Africa outside South Africa. It is, therefore, not only a valuable resource for the Cameroon Biosecurity Project, but it is also beneficial for the country as a whole, the sub-region and entire continent.

Its objective was achieved by producing a relevant, replicable and an easy-to-analyse set of survey protocols. Periodic use of these survey methods during the current study resulted in an approximation of the degree to which the project interventions will enhance knowledge and understanding of pertinent issues.

To some extent, the size of the study is a weakness as well as strength. The length of the questionnaire was an obstacle for many. Considering the extent of redundancy, it would be convenient that the follow-up questionnaire, developed when assessing changes in knowledge, attitude and practice at half time, takes this fact into account for better results.

As mentioned, this study did not include many people with low educational levels. This will be addressed in the follow-up work, which may include some retrospective baseline assessment for groups that were under-represented in this survey.

The findings of this study however are, very likely, representative of the situation in much of the African continent. They led to a greater understanding of the stakeholders’ knowledge level gaps in biosecurity issues. This understanding will help focus the biosecurity communications and awareness plan (communication strategy) on some priority communication objectives.

It is vital, therefore, to disseminate the findings of this study widely so they can be put to good use for similar studies undertaken in other countries. This report will be posted on the project website so that its findings can be available to the outside world and as a means of raising the profile of the Cameroon Biosecurity Project.

**THE MINISTER OF ENVIRONMENT,  
PROTECTION OF NATURE AND  
SUSTAINABLE DEVELOPMENT**