NATIONAL PROJECTS

TRAINING PROGRAMME

Each national project has a training component. This component, as shown in Figure 3, is central to all FAO biosafety capacity building projects, and consists of delivery of training courses on agricultural biosafety and supporting training materials.

The basic training programme for regulators and technical staff developed by FAO, comprises theoretical lectures and practical exercises aiming at: 1) providing basic knowledge of various subjects of relevance to agricultural biosafety; and 2) integrating competencies of the different actors involved.

Training is therefore composed of the following modules:

- *Agricultural biotechnology*, which reviews the very basic scientific concepts and principles employed in producing GMOs, with specific emphasis on the following key areas:
  - basic concepts of biotechnology;
  - genes: structure and function;
  - promoters, vectors and transformation cassettes;
  - plant transformation and selection techniques;
  - biotechnology for the improvement of animal breeding;
  - genetic engineering of micro-organisms of interest to agriculture;
  - detection methods for GMOs.

  It also provides a brief description of current and emerging uses of biotechnology in crops, livestock and fisheries with a

view to understanding the technologies themselves and ways in which they complement and extend other approaches. These concepts and principles are critical in ensuring pro-active participation to the process of reviewing dossiers and taking part in decision-making.

- *Ecological aspects*, which provide the necessary background information on ecology and evolution needed to analyse and understand the consequences of introducing GMOs into the environment, and to show that many areas in ecology can benefit from research tools based on applications of molecular genetics and biotechnology. These tools include investigations into population biology and evolution, and conservation and use of genetic resources for both human requirements and environmental protection.
- *Risk analysis*, which provides basic information on biological risks, concepts, principles, and methodologies of risk assessment, risk management and risk communication (except post-release monitoring and detection techniques, which are addressed in Module 4). It focuses on crop biotechnology and environmental risk assessment of GM crops since these are of immediate interest to most countries.
- *GMO monitoring*, which addresses use and monitoring of GMOs under containment, confinement and limited field trials, as well as post-release monitoring of GMOs. It also covers surveillance and emergency planning.
- *Legal aspects*, which provides an overview of the existing legal tools and frameworks on biotechnology and biosafety, and offers a thorough description of the international instruments that regulate biosafety and their interactions. It also includes considerations of legal relevance for drafting and implementing national biosafety frameworks.

However, on countries' request, in-depth hands-on training courses were carried out on:

- GMO detection (in the Dominican Republic, Kenya, Malaysia, Paraguay, Uganda and the United Republic of Tanzania).
- Communication for development (ComDev) and public awareness in Bangladesh, Nicaragua, Paraguay and Sri Lanka.
- Economic and trade aspects of biotechnology application in Sri Lanka.

Despite using the **same structure**, the actual implementation of the training programme **differs** greatly in **content and approach**. Differences in countries' biotechnology and biosafety policy, as well as regulatory and institutional contexts, are taken fully into consideration together with the capacity building needs of specific recipients, namely regulatory officers, technical staff, researchers, extensionists, port authority officers, and plant quarantine officers, etc. In Grenada, for example, training activities were organized on three different levels:

- a training workshop for officers, scientists and technicians indirectly involved in the biosafety system but not expected to directly participate in the risk analysis process. This training focused on basic concepts and general principles of agricultural biotechnology, ecology, risk assessments, and biosafety legislation at national and international level;
- a training course for members of the national biosafety committee and other technicians and officers expected to take part directly in the risk analysis process (Biotechnology Laboratory, Bureau of Standards, Produce Chemist Laboratory, etc.);
- in-service training to communication specialists in order to design target biosafety communication strategies and to better appreciate how ComDev can enhance stakeholder participation in related biosafety decision-making.

Training materials, including brochures, books, PowerPoint presentations, videos and exercises, constantly updated to keep abreast of any development in biotechnology and biosafety, form part of the training programme.

Over time, and in line with the recommendations of the Expert Consultation on Biosafety held in February 2006, FAO has been engaged in providing long-term, sustained access to biosafety information, particularly in developing countries, by providing appropriate training materials on electronic support, such as CD-ROMs, etc. Considerable progress was made in fine-tuning and better adapting lectures and training tools to the training needs. In this respect, background lectures are currently being synthesized and collected in the *FAO Agricultural Biosafety Compendium*, which will serve as reference material for future capacity building activities. So far, the training activities have reached approximately 2 500 people in total.

Engaging experts from developing countries as trainers has contributed to promote South-South Cooperation, expand biosafety networks and better serve the biosafety technical assistance neeeds of the countries involved

FAO's training courses follow a specific policy: whenever possible, experts from developing countries (making use of the Technical Cooperation among Developing Countries/ Technical Cooperation among Countries in Transition [TCDC/TCCT] Experts Programme[8]) are employed as trainers. Under the direct coordination and supervision of the FAO project manager, TCDC experts are responsible for preparing/revising lectures and training materials of each training session, in line with the characteristics and needs of the recipient country.

In line with the broader UN development cooperation objectives, special attention has also been devoted to ensuring gender balance within each training workshop and in other project activities.

Experience gained and the way forward

- The analysis of the characteristics of targeted trainees has proved essential. The training activities need to be tailored to a target audience and carefully planned.
- The training programme for regulatory officials has helped to expand the critical mass of technical expertise on agro-related biosafety issues at national, subregional and regional level. Nevertheless, sustainability is constantly challenged by the frequent turnover of personnel in regulatory agencies. As a mitigation measure, FAO is targeting a larger number of participants to create a building block of in-house knowledge with a higher chance of long-term continuity. Frequent employee turnover is also being addressed through Training of Trainers (ToTs) workshops.
- The *FAO Agricultural Biosafety Compendium* will serve as reference material for future capacity building activities and

[8] Information on the Technical Cooperation among Developing Countries/Technical Cooperation among Countries in Transition (TCDC/TCCT) Partnership Programme is available at http://www.fao.org/GENINFO/partner/en/exptechcoop/index.html

will represent the basis for further local training, thus improving sustainability of project results. It will be made available to countries upon request and will be placed on the Web site for easy access and downloading. If possible, the training package will be translated into the official UN languages to ensure accessibility and wide divulgation. Further divulgation would be facilitated by translation into local languages.

- Experience has shown that training activities, beyond their educative nature and purpose, have become informal round tables for analysing country situations, identifying options and settling disputes among regulatory authorities.
- The Expert Consultation on Biosafety held in 2006 recommended FAO to add to the training a session on how to search for biosafety information by remote-training or self-training modules. This is progressively being integrated into the training package.
- As mentioned above, and in accordance with the Organization's policy, experts from FAO's Partnership Programme (i.e. TCDC/TCCT[9] experts,) are preferably employed as trainers. This approach has contributed to the promotion of South-South Cooperation (SSC), expanding biosafety networks among developing countries, and better serving the biosafety technical assistance needs in complex and fragile social, economic and environmental contexts.
- Gender balance in each of the training activities ensures coherence with the development cooperation objectives set out in the mandate of FAO, and that of the UN in general.

[9] Please refer to footnote 8 on page 17

FIGURE 3 // SCHEMATIC REPRESENTATION OF FAO PROJECT COMPONENTS

TRAINING — **core component** of the FAO biosafety capacity building activities at national, regional and global level

TRAINING PROGRAMME

- Agricultural biotechnology
- Ecological aspects
- Risk analysis
- Post-release monitoring and detection techniques
- Legal, administrative, socio-economics and ethical aspects of a biosafety regulatory regime
- GMO detection
- Communication and participation

OTHER ACTIVITIES CARRIED OUT AT NATIONAL LEVEL

POLICY
- National policy development and formulation
- Participatory approaches
- Consultation with stakeholders

REGULATION
- Review of national legislation
- Consultation with stakeholders
- Support in the formulation or revision of the biosafety legislation and related implementing regulations and guidelines

MONITORING AND DETECTION
- Laboratory establishment

COMMUNICATION, PARTICIPATION, PUBLIC AWARENESS
- KAP surveys
- Communication strategy development and implementation
- ComDev skills and methods

OTHER ACTIVITIES CARRIED OUT AT REGIONAL AND SUBREGIONAL LEVEL

REGIONAL/SUBREGIONAL HARMONIZATION
- Harmonization of guiding principles, regulatory frameworks, standards and guidelines
- Establishment of regional biosafety networks
- Delivery of issue-specific training
- Sharing the limited available human and infrastructural resources to foster the pooling of resources and economies of scale

POLICY AND REGULATORY ASPECTS

Regulatory frameworks on agricultural biotechnology address safety issues, meet the requirements of the Cartagena Protocol and are in line with other related international instruments.

To date, FAO has supported several countries, including Bangladesh, Nicaragua, Paraguay and Sri Lanka, in developing national biotechnology policies and strategies, and provided legal assistance to Benin, Bolivia, Grenada, Paraguay and Swaziland.

Capacity building support on legal aspects is structured to be non-intrusive, systemic and forward-looking. In so doing, it comprised expert advice, analysis of pros and cons associated with the available options, and legal assistance in drafting policies and legislation based on country decisions and the anticipated regulatory results.

In brief, it includes:

- review of national (environmental legislation, plant and animal health and quarantine, food quality and safety, seed production and certification, etc.) and international legislation related to biosafety;
- consultation with stakeholders (ministries, regulatory bodies, farmers' associations, private sectors, Non Governmental Organizations [NGOs]);
- support in the formulation of draft policies, (biosafety) laws, regulations, and implementation guidelines;
- revision of the draft or existing biosafety legislation, in conjunction with interested parties.

In some cases the legislative process resulted in the swift adoption of a policy or a law, while in others the drafted texts are still being discussed by the relevant institutional authorities. As a result, the success of the legal assistance differs consistently from country to country.

Nevertheless, the participatory process launched at all levels for policy development and law formulation, proved to be as relevant as the result itself. Although time-consuming, involvement of the main stakeholders (Ministries of Agriculture, Environment, Science and Technology, research and technology centres, extension and technical advisory services, NGOs, the private sector, including seed companies, and civil society organizations, farmers and their associations) stimulated debate, ownership and commitment. In Nicaragua and Paraguay, for example, a series of participatory workshops was held in each district. The resulting draft policy and legislation documents were therefore widely shared and, in principle, likely to be more readily approved and implemented. The incorporation of ComDev tools in this phase adds clarity and builds greater consensus among stakeholders.

FAO has progressively gathered and made available in its Web site a collection of national and subnational biotechnology policy documents[10]. A description of the FAO Biotechnology Web site is given on page 39.

Experience gained and the way forward

- The development of an effective coordination mechanism, involving the main stakeholders and ensuring coordination of roles and responsibilities among the relevant authorities dealing with biosafety, forms the base for a solid institutional setting at national level. It is essential that the coordination mechanism be clearly outlined and agreed upon by the parties involved before being regulated.
- A clear agricultural national biotechnology/biosafety policy, setting goals and priorities, as well as providing guiding

[10] The biotechnology policy documents are available at the URL: http://www.fao.org/biotech/country.asp

principles, is the basis for the development of a robust national regulatory regime and related institutional setting.

- Regional and subregional harmonization of biosafety regulatory and administrative aspects (notification forms, for example) is highly recommended to countries sharing economic interests.

GMO DETECTION AND MONITORING

The GMO detection and monitoring component was devised for those situations where there was a need to build or strengthen capacities e.g. the Dominican Republic, Kenya, Malaysia, Paraguay and the United Republic of Tanzania.

Indeed, inadequate capacities, lack of coordination and insufficient access to information have major consequences in applying the national regulatory frameworks. At the national level, one of the most frequent problems faced by regulatory agency personnel is the lack of some basic technical information to deal with issues related to GMO detection.

Increased capacity in GMO detection and monitoring is a key issue for countries to meet technical requirements deriving from international obligations, as well as a key element of enhanced autonomy

There is consequently a greater dependency on external structures for any GMO detection activity that may be deemed necessary, and its associated costs. At regional and subregional level, different detection methodologies, protocols, standards and certification schemes imply an unharmonized biosafety scenario which could impede trade relations, or any agreed approach to addressing them.

Experience gained and the way forward

- Increased capacity in GMO detection and monitoring is a key issue on which FAO will continue to focus in the years to come. It not only enables countries to meet technical requirements deriving from international and national obligations, but is also a key element of enhanced scientific, and political, autonomy of the countries and regions, reducing dependency on external/foreign laboratories' support for GMO detection and related activities.
- The possibility of laboratories being paid for the services they provide (GMO monitoring and detection), and benefiting from the financial resources that these activities generate, depends on national regulations, and has to be accurately assessed in line with the country's national budget organization and functions.
- FAO has addressed GMO detection and monitoring at all the operational levels - national, subregional, regional and global. As a first action at national level, FAO has included a specific module on GMO detection and post-release monitoring, and hands-on training practice in its training programme. This approach is considered of great use by the regulatory staff and personnel, since they receive first hand knowledge and increased awareness for direct use in the assessment of GMO-related applications and submissions. Where needed, FAO has strengthened infrastructure and laboratory facilities for regulatory agencies to provide greater capacity to detect and

handle biotechnology products. While the experience has been positive, FAO support to laboratories needs further consideration so as to ensure the appropriate use and maintenance of equipment in the long term.

- Sharing laboratory facilities among regulatory bodies of neighbouring countries could in some case reduce the costs and improve sustainability of GMO detection activities, but the real and effective establishment and implementation of subregional collaboration remains problematic in many instances.

COMMUNICATION AND PUBLIC PARTICIPATION

Projects in Bolivia, the Dominican Republic and Grenada comprised a communication and participation component: they all made use of the Knowledge, Attitude and Practices (KAP) survey approach as a first step towards the development and formulation of a communication and public awareness strategy.

A KAP survey[11] is a 'representative study of a specific population to collect information on what is known, believed and done in relation to a particular topic, in this case biosafety. In most KAP surveys, data are collected orally by an interviewer using a structured, standardized questionnaire. These data can then be analysed quantitatively or qualitatively depending on the objectives and design of the study. However, differently from simple polls, KAP surveys address broader cultural issues through questions about general practices and beliefs'.

In addition to these standard KAP measures, however, the ComDev approach makes use of participatory, qualitative tools to

[11] World Health Organization (2008) Advocacy, communication and social mobilization for tuberculosis (TB) control, *A Guide to Developing Knowledge, Attitude and Practice Surveys*. WHO/HTM/STB/2008.46. http://www.stoptb.org/resource_center/assets/documents/ACSM_KAP%20GUIDE.pdf

Training is central to FAO biosafety projects

engage stakeholders in situational analysis and needs assessment. This not only yields KAP baseline data for monitoring and evaluation, but also enhances consensus and helps to construct culturally relevant and appropriate messages and media products.

KAP survey data are essential "to help plan, implement and evaluate advocacy, communication and participation work.

The survey can be conducted at any point, but is most helpful if conducted in the early phases of the communication activity development, as it sets the basis for planning further"[12], in this case, a communication and participation strategy.

As a result, the communication and participation strategies produced in the above-mentioned countries are based on targeted awareness building activities and tools, and ensure access to information and public participation in the decision-making process.

[12] ibid.

Gender balance ensures coherence and commitment with the UN development cooperation objectives

The implementation of these strategies has been further promoted through the following tools:

- workshops with targeted audiences;
- information toolkits;
- local media;
- conveying messages through *credible witnesses*.

For example, the project in Sri Lanka assessed the communication behaviour patterns of targeted audience, such as farmers, researchers, extensions workers, and scientists with regard to agricultural biotechnology. It likewise explored their perception of agricultural biotechnology, as well as newspapers' coverage.

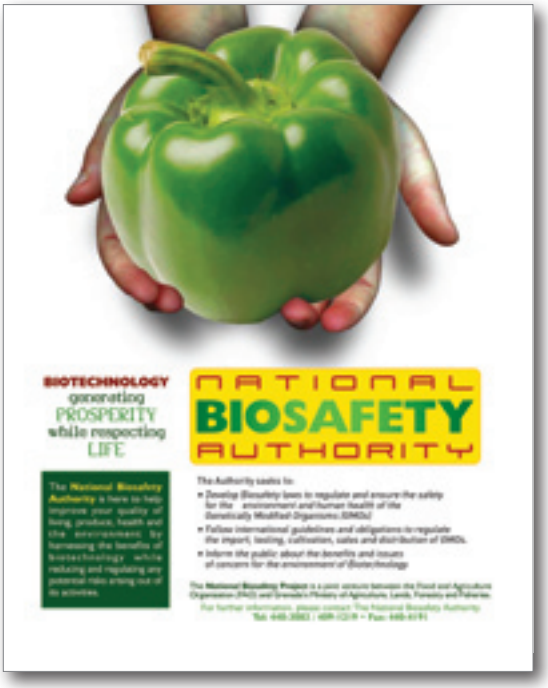
Communication behaviour includes information sources, specific topics or messages sought and received, information-seeking models (passive or active), media preferences and information utilization.

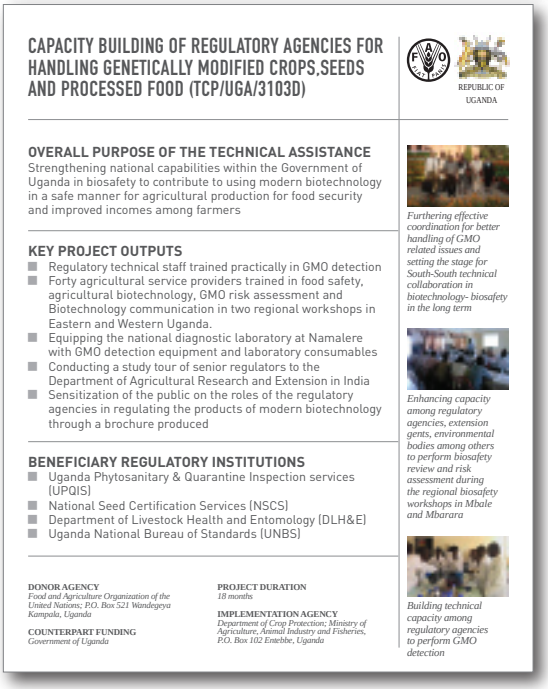
The perception study was helpful in determining possible reasons for the target audience's bias for or against agricultural biotechnology. This and the findings of the assessment, formed

the basis of recommendations concerning the promotion of public awareness and participation in support of the National Agricultural Biotechnology Research and Development Programme and Investment Plan in Sri Lanka.

Experience gained and the way forward

- KAP surveys, communication patterns and perception studies provide an insight of the social situation at local level and perception of what the communication efforts should address. They are at the base of the communication and participation project component and should employ ComDev tools and methods.
- For the purpose of information and communication strategies and plans, translation into the local languages is highly recommended.
- Strategies implementation promoters (workshops, toolkits, local media, credible witnesses) have proved to be an easy yet effective way to facilitate communication and participation.





CAPACITY BUILDING OF REGULATORY AGENCIES FOR HANDLING GENETICALLY MODIFIED CROPS,SEEDS AND PROCESSED FOOD (TCP/UGA/3103D)

REPUBLIC OF UGANDA

OVERALL PURPOSE OF THE TECHNICAL ASSISTANCE
Strengthening national capabilities within the Government of Uganda in biosafety to contribute to using modern biotechnology in a safe manner for agricultural production for food security and improved incomes among farmers

KEY PROJECT OUTPUTS
- Regulatory technical staff trained practically in GMO detection
- Forty agricultural service providers trained in food safety, agricultural biotechnology, GMO risk assessment and Biotechnology communication in two regional workshops in Eastern and Western Uganda.
- Equipping the national diagnostic laboratory at Namalere with GMO detection equipment and laboratory consumables
- Conducting a study tour of senior regulators to the Department of Agricultural Research and Extension in India
- Sensitization of the public on the roles of the regulatory agencies in regulating the products of modern biotechnology through a brochure produced

BENEFICIARY REGULATORY INSTITUTIONS
- Uganda Phytosanitary & Quarantine Inspection services (UPQIS)
- National Seed Certification Services (NSCS)
- Department of Livestock Health and Entomology (DLH&E)
- Uganda National Bureau of Standards (UNBS)

DONOR AGENCY
Food and Agriculture Organization of the United Nations; P.O. Box 521 Wandegeya Kampala, Uganda

COUNTERPART FUNDING
Government of Uganda

PROJECT DURATION
18 months

IMPLEMENTATION AGENCY
Department of Crop Protection; Ministry of Agriculture, Animal Industry and Fisheries, P.O. Box 102 Entebbe, Uganda

Furthering effective coordination for better handling of GMO related issues and setting the stage for South-South technical collaboration in biotechnology- biosafety in the long term

Enhancing capacity among regulatory agencies, extension gents, environmental bodies among others to perform biosafety review and risk assessment during the regional biosafety workshops in Mbale and Mbarara

Building technical capacity among regulatory agencies to perform GMO detection

Posters prepared within the information and communication activities carried out in Grenada (TCP/GRN/2902) and Uganda (TCP/UGA/3103)