The Indian Experience in Establishment of National Information Sharing Mechanism for Monitoring the Implementation of GPA

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The Global Plan of Action (GPA) for conservation and sustainable utilization of Plant Genetic Resources for Food and Agriculture (PGRFA) is an initiative of Food and Agriculture Organization (FAO), signed by 150 countries at Leipzig, Germany in 1996. The GPA is a framework of activities encompassing development of *in situ* conservation of PGRFA, sustaining existing collections, enhancing utilization and increasing capacity of countries regarding education, public awareness and training on these aspects. FAO has developed a monitoring process of implementation of GPA in different countries through a mechanism called National Information Sharing Mechanism (NISM) for monitoring the implementation of GPA. The Indian experience in implementation of this mechanism and its outcome is discussed in this article.

Key Words: Global Plan of Action, Plant Genetic Resources for Food and Agriculture (PGRFA), *In Situ* and *Ex Situ* Conservation, Information Sharing

Introduction

The Global Plan of Action (GPA) is the initiative by the Food and Agricultural Organization (FAO) of the United Nations for the conservation and sustainable utilization of plant genetic resources for food and agriculture (PGRFA). It is essentially a country-driven process and countries having adopted the GPA, are required to take actions within the framework of the defined priority areas depending on their capacity and also on the status of PGRFA management (FAO, 1996). The FAO Commission on Genetic Resources for Food and Agriculture (CGRFA) with inputs from Bioversity International, erstwhile known as International Plant Genetic Resources Institute (IPGRI), in line with recommendations made by the Inter-governmental Technical Working Group on PGRFA of the Commission in 2001 adopted a new approach for monitoring the GPA implementation (FAO and IPGRI, 2001). A project on monitoring the implementation of GPA commenced in June 2003 at FAO, adopting a country-driven, participatory and capacity building process. It was based on a set of internationally agreed indicators and a reporting format for monitoring the GPA implementation, and an information system to facilitate and simplify recording, processing, analysis and sharing of the information addressed by the indicators and the reporting format. The indicators and the reporting format were developed in consultation with an expert group at a meeting convened by FAO and Bioversity International (CGRFA 2004 a).

The main objectives of the new monitoring approach of GPA were to: improve countries' capacities to manage information on PGRFA; allow meaningful analysis of gaps and priorities; improve decision-making on and planning of available resources; build stronger partnerships among stakeholders in the management of PGRFA within each country. Accordingly, the FAO project funded by Government of Japan (GCP\RAS\186\JPN) was implemented in 7 countries of Asia Pacific Region namely India, Thailand, Philippines, Vietnam, Sri Lanka, Malaysia, Bangladesh. The present paper describes the Indian experience of implementing the project

Monitoring of GPA: The Indian Experience

The process for the establishment of the National Information Sharing Mechanism (NISM) in India began in 2004 through a letter of agreement, which was signed between Department of Agriculture and Co-operation (DAC), Government of India and the FAO Regional Office at Bangkok. All activities foreseen under this agreement were coordinated by the National Bureau of Plant Genetic Resources (NBPGR), which was designated as the focal point for the implementation of GPA.

The project was implemented during 2005 with an aim to establish a continuing monitoring framework of the GPA implementation at national level. This was envisaged to be achieved through: (a) thorough assessment of the present status of PGRFA in the country and the region for the identification of needs and effective strategies for conservation and utilization of PGRFA; (b) the establishment of a National Information Sharing Mechanism on the GPA Implementation (NISM-GPA) to enhance coordination of plans and activities on

conservation and utilization of PGRFA amongst stakeholders and for achieving the objective (a); (c) capacity building and training for National PGRFA Programmes; (d) sharing of experiences in PGRFA *in situ* conservation and on-farm management; and (e) the improvement of regional cooperation.

The Role of Stakeholders in India

Stakeholders included governments, ministries of agriculture and of the environment, gene banks, breeders and breeders' associations, seed producers, research and training institutions, rural associations, civil society organizations involved with and related to the conservation and utilization of PGRFA, and focal points of international conventions such as the Convention on Biological Diversity.

As per the FAO guidelines, all activities coordinated by the NBPGR were divided in three distinct phases: (i) a preparatory phase, (ii) an implementation phase and (iii) a conclusion/reporting phase.

The Preparatory Phase

During the preparatory phase, work was focused on reviewing all materials, briefing and raising awareness of authorities and getting necessary permissions to undertake a collaborative information sharing process that includes the national PGR programme, the private sector, NGOs' and other public sector organizations and cross-ministerial collaboration. A committee of key stakeholders was formed to guide the GPA monitoring process and the Country Report preparation, and to identify stakeholders to be involved into this process. A total of 114 stakeholders were identified during the preparatory phase. The First National Stakeholders Workshop of the Project was held during January 2005 at NBPGR. The participants included representatives of key stakeholders Ministries/ Departments, International Crops Research Institute for the Semi-Arid Tropics, Indian Council of Agricultural Research crop based institutes and Dr. Ng Quat, the Chief Technical Advisor of the Project from FAO Regional Office, Bangkok.

The Implementation Phase

During the implementation phase a number of meetings and 6 workshops were held to explain the process and build capacity of stakeholders in the use of the computer application for gathering information. Direct technical assistance to stakeholders was also provided during this phase. During the training workshops, a comprehensive understanding of the Indicators and Reporting Format for monitoring GPA implementation was discussed and practical sessions on the use of the computer application for managing and sharing information among stakeholders were conducted. A detailed timetable for completing the questionnaire by the stakeholders and submitting the information to the National Focal Point was also circulated during each training programme. Each stakeholder was provided with a hard copy of the reporting format and the manual of the NISM software. A copy of the NISM software was given to each Stakeholder after a registration process. A unique key was generated in the NISM-GPA software for each registered stakeholders, which kept track of the data submitted by individual stakeholder.

The stakeholders were trained to edit/enter the information as per the format of the document, including a demonstration of the process of data entry into the National Focal Point Version of the NISM-GPA database through the local area network temporarily created for the purpose of training.

All the stakeholders were given a month's time after attending the training to submit the data. The data received from 91 stakeholders was merged with the National Focal Point version of the NISM-GPA after elimination of the duplicate records. The data after merging was utilized for the preparation of the national report for the implementation of the NISM in India.

The Conclusion Phase

During the conclusion/reporting phase, second round of meetings for the data validation and to discuss the draft report on monitoring the implementation of the NISM were held during the month of November 2005. During these meetings, the data submitted by the stakeholders was reviewed individually with each stakeholder and corrections/suggestions were incorporated in the NISM database accordingly. The draft report based on analysis of data gathered from stakeholders was produced and discussed with all participating stakeholders. A web site (http://www.nbpgr.ernet.in/) describing the Mechanism and including a database search engine was developed and made available to the users. Compact discs including the complete database of the Mechanism were produced and distributed to the stakeholders involved in the process.

The revised draft report (Agrawal *et al.*, 2006) was presented before the National Advisory Committee of the project for approval during March 2006. The final report of India has been submitted to the FAO. This report shall

Table 1. Total accessions conserved *ex situ* and number of safety duplicates for various categories of crop species (1996 – 2005)

Status	No. of crop sp.	No. of accessions	Safety-duplicates as active collections	Safety-duplicates (%)
Traditional cultivar/ Landrace	280	121274	84931	70
Wild	314	15881	4745	30
Weedy	70	267	11	4
Breeders' Line	37	14661	2272	15
Mutant/ Genetic Stock	26	7898	4880	62
Advanced/ Improved cultivar	59	9080	4867	54
Others	73	27662	2378	9

form the basis for the preparation of the second report of India on the state of the world's PGRFA (CGRFA 2004 b).

Some Observations from the Analysis of the NISM Information

Amongst the total accessions of PGRFA conserved in India, about 64.2% were conserved in long-term seed genebank and 33.3% were held either in medium- or short-term storage or in field genebanks. The rest were conserved in cryobanks or *in vitro* genebanks. Stock inventorization and monitoring of viability was performed regularly in most of the accessions, while the genetic integrity were checked occasionally. The data related to *ex situ* collections were predominantly published in the form of printed copy and most of the publications included passport data, characterization and evaluation data. About 60% publications had analyzed data, whereas 34% publications had raw data.

The greatest constraints to sustain *ex situ* collections reported were lack of funding and limited number of trained staff to cover all activities related with management of PGRFA following all possible approaches. Lack of adequate facilities was the other constraint reported by some organizations. For better management practices to reduce genetic changes or loss of genetic integrity, suitable regeneration environment were selected. Adequate population size and proper handling of regenerated material was in close collaboration of crop-based institutes.

There is a built-in duplicity of accessions in the system, wherein the accessions conserved at NAGS and the crop-based institutes as active collection were conserved as base collection in the National Genebank. The active collections used in research and crop improvement and the National Genebank helped in restoration of lost accessions to the active sites. This also served as safety mechanism.

The details of the total accessions and safety duplicates conserved as active collections under *ex situ* are presented in Table 1.

Amongst the *ex situ* conserved accessions which are threatened (low seed number, loss in viability during storage) 38,031 were regenerated according to established standards, while 42,148 still required to be regenerated. In the latter case, where priorities for regeneration have been set and the activities were underway, a maximum of 10 years may be required. Most of the stakeholders (65%) reported good regeneration capabilities of *ex situ* accessions in restricting the loss of genetic diversity. Only 15% reported undertaking of regeneration of existing backlogs.

Planned and targeted collection of PGRFA has been systematically undertaken in India, especially during 2000-2005 under the World Bank funded National Agricultural Technology Project (NATP). The number of accessions collected, districts explored and accessions stored in the long-term storage (LTS) are indicated in the Table 2.

Major gaps in collection reported were under-explored/unexplored areas and incomplete coverage of gene pools of the targeted taxa (Fig. 1). Priorities, needs and constraints in supporting planned and targeted collection of PGRFA, were taken into consideration for further action at national or sub-regional level.

Table 2. Details of collection missions undertaken for targeted collection of PGRFA (1996-2005).

Item	Number
Collection missions	78
Crop species collected	571
Accessions collected	86,005
Accessions in long-term storage	55,595
Total districts covered for the exploration	402

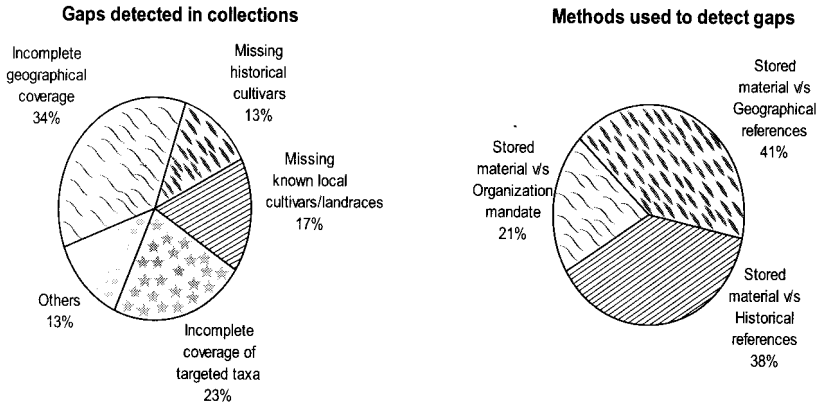

Fig 1: *Gaps detected and methods used in supporting planned and targeted collection of PGRFA*

Conclusions

The NISM in the Monitoring of the Implementation of the GPA has been a very useful project in India. This project has helped in identifying the institutions involved in PGR related activities and the synthesis of all the PGR work in India. This information generated shall be used for effective planning of projects and to identify priority areas. It will also help to eliminate duplication in efforts of the various agencies. Gaps in PGRFA activities would be filled with certainty and not based on speculation. As part of awareness raising and strategic development, policy makers in the country would be supplied with vital information on PGRFA relevant to political debate and interested parties would be given appropriate advice. This will help the promotion of coherence between different sectors, for example environment and agriculture and their support approaches. As much as possible the implementation of the NISM should be strongly linked with other areas of national policy.

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