



# Moving forward:

## Status of Information on Plant Genetic Resources for Food and Agriculture in Asia

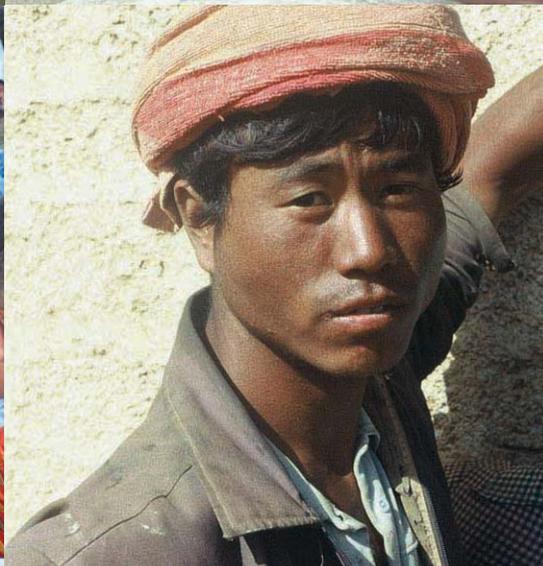
### Record of the Final National Focal Point Meeting

GCP/RAS/240/JPN

17<sup>th</sup> October 2011

Tsukuba, Ibaraki

JAPAN





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JAPAN**

**Food and Agriculture Organization of the United Nations  
Regional Office for Asia and the Pacific  
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**Cover photographs:**

*Front cover photos: Top left to right* – Pomegranate; legume diversity in northern Thailand; peanut farmer Myanmar (credit Duncan Vaughan);

*Bottom left to right* – Biodiversity fair Bhutan (credit Asta Tamang); farmer Myanmar (credit Duncan Vaughan); chili pepper in Japan (credit Fumihiko Yamasaki).

*Back cover photos: Top left to right* – Japanese pear (credit Fumihiko Yamasaki); coconut harvesting, Sri Lanka (credit Duncan Vaughan); training on the use of NISM in Vietnam (credit Tran Danh Suu);

*Bottom left to right* – rice farmer Bangladesh (credit Duncan Vaughan); NISM web page.

## Foreword

This document represents a record of the final National Focal Point Meeting of project GCP/RAS/240/JPN. Each of the fifteen countries in the project presented a summary of the in-country activities of the project. Full reports of the in-country activities of project member countries can be found in the individual country reports that are uploaded into the FAO registry. Apart from the National Focal Points of each country or their representative the meeting was also attended by officials of the donor country, Japan. Mr. Yasuro Funaki, representing the International Division of the Ministry of Agriculture, Forestry and Fisheries, Japan gave a welcome address. Mr. Hiroyuki Tanaka and Ms. Fumiko Yagihashi. The meeting was held in Tsukuba where the national Genetic Resources Center of Japan is located in the National Institute of Agrobiological Sciences. The meeting also heard a welcome speech from the Center Director, Mr. Makoto Kawase. A full list of participants of the meeting can be found on page 81 of this document.

While this document records the final NFP meeting of the Project all countries were asked to address sustainability of the NISM databases that they have developed over the past several years. Each country has pursued a different course in relation to in-country activities that reflects the level to which the PGRFA system in the country has developed and whether the country was involved in the previous related project GCP/RAS/186/JPN. This final meeting revealed that the PGRFA national databases in Asia are now well developed and each country has a much better idea of the people involved in the array of activities that constitute national PGRFA system.

The second day of the Tsukuba meeting was a symposium jointly sponsored by NIAS and FAO. The proceedings are published as a separate document in the FAO RAP series. On the final day of the meeting participants went on a field tour and learned about the PGRFA and crop wild relatives in the Tsukuba area. Photos of the meeting on the 17<sup>th</sup> October and the study tour are to be found at the back of this publication as well as the draft “crop list” made during the study tour.



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## **Welcome Address**

**Mr. Yasuro Funaki, International Division  
Ministry of Agriculture, Forestry and Fisheries, Japan**

Good morning and welcome to Japan.

It is a pleasure for me to join this meeting today because over the past several years my department to Tokyo has been following, from afar, the projects that FAO has been running on Plant Genetic Resources for Food and Agriculture (PGRFA) in Asia sponsored by the Japanese government. Today I can observe, up close, the project activities and outputs. I will be able to get a sense of the usefulness of the project to participating countries.

Japan recognizes that no country can be independent with respect to PGRFA. This project has fostered a PGRFA network right across Asia. I hope that the next 3 days will strengthen relationships among the PGRFA leaders here. We hope that the relationships built during this project among countries, as well as with FAO, will continue well beyond the life of this project.

Today I will listen to what has been done during this project. I am well aware that the experiences of each country will be different. Some countries have had to work in English and their own language. Some countries started with no PGRFA database, others had well developed databases. Countries in this project have vast differences in size and also resources to undertake this project. Therefore experiences in project implementation will be very different from country to country. I will be interested in these differences and also how countries successfully overcame the various difficulties the project posed in relation to their own circumstances.

At the end of today's program there a discussion and I will be happy to hear your general views on the project and future perspectives.

Thank you.

## Opening Address

Mr. Makoto Kawase,  
Director of the Genetic Resources Center  
National Institute of Agrobiological Sciences, Japan

It is a pleasure for me to welcome you to Tsukuba for what, I hope, will be a valuable few days together. It is a pleasure for me to see old friends and I look forward to making new friends this week.

Today the focus of discussions is the FAO project, supported by Japan, to improve plant genetic resources information. At our NIAS genebank, which you will visit tomorrow, the PGRFA database is a central part of our operation. The database you are developing in the FAO project is not a genebank database but a PGRFA monitoring database. However, it can play an important role in helping each country organize its PGRFA system. It is hoped that the NISM database developed in each country strengthens both linkages within your countries and also among countries.

As director of a genebank I am fully aware of the multi-faceted work that it involves. Trying to get a PGRFA conservation and sustainable use system organized effectively is complex, but vital work. I think that we can all learn from one another as we sharing many similarities in what we do as well as have our own unique situations.

The few days we are together this week I hope will also be an opportunity to establish new linkages on themes of mutual interest. The NIAS Genetic Resources Center has developed over the last several years' special "core/mini-core" sets of germplasm for rice, sorghum, soybean and *Vigna*. We are eager to share these with other countries and develop collaborative research using these materials in the hope that it promotes use of PGRFA. So it is my hope that outside the formal setting of the next few days we will have the opportunity to have constructive discussions for future interaction.

Finally I hope that you take back to your countries good experiences from Japan.

## **The final NFP meeting of Project GCP/RAS/240/JPN**

Duncan Vaughan  
Chief Technical Advisor (GCP/RAS/240/JPN)  
FAO RAP

First let me welcome you to my home town. I am delighted to see old friends and also new comers to the group. Among the new National Focal Points this year is Ms. Rosliza from Malaysia, Mr. Bansal from India, Mr. Ratnasiri from Sri Lanka and Mr. Ye Tun Tun from Myanmar; our new friends. Also this morning we have the pleasure of the company of Mr. Tolo from Samoa, from whom we will hear an interesting story tomorrow, also Ms. Charlotte Lusty from the Crop Diversity Trust and my colleague from FAO RAP Mr. Subash Dasgupta.

We have come to the point when we open the oven and see if the cake is baked properly.

Last month, almost all countries completed their in-country activities. Today is a chance to share with our PGRFA community what was done and what was achieved. I have now been to all project member countries and have a good feeling for what has been done. Each country has a different capacity and is at a different stage in developing their national plant genetic resources system. Some countries have a very well developed national PGRFA programme; others have no programme at all. There are various stages in between. Hence the approach to this project in different countries has varied hence outputs and varied too.

I have many impressions from my visits to project member countries and I have generally been impressed with the dedication of staff to the project. In Mongolia it was possible to help make linkages among institutions that were conducting PGR activities independently. In Sri Lanka the ending of the civil war has enabled different parts of the country to re-establish PGR contact. In Indonesia the establishment of a dedicated team for the duration of the project enabled the foundation NISM-Indonesia to become established with a fancy website portal. One country has been able to support a MSc student in PGRFA, another has produced a TV programme, several countries have produced various PGRFA catalogues. One country has updated their country report, it is full of information and over 212 pages.

We will hear more during the day. I would like to thank you all for your support to this project and helping staff in your country fulfill, often in difficult circumstances, the agreed work plan.

A particularly important part of today and the reason this meeting is in Japan is to allow our colleagues from Japan, who have worked hard to secure money for the project, an opportunity to evaluate the project. We are grateful to Mr. Funaki, Mr. Tanaka and Ms. Yagihashi for sparing the time to join the meeting here today.

Finally while this is the final National Focal Point meeting of the project the community of workers in PGRFA in Asia is not so great and at various times you have had the chance to meet each other outside the context of this project for example in Bali earlier in the year or in Rome at the Commission on Genetic Resources meeting. As a consequence many of you have become friends and the “network” across Asia that is an important component of the project has become informally established.





**Participants in the final National Focal Point Meeting of Project GCP/RAS/240/JPN**

*Front row left to right:* Ms. Rosliza Jajuli, Mr. Tran Danh Suu, Mr. Makoto Kawase, Mr. K.C. Bansal, Mr. Clarito Barron, Mr. Leocadio Sebastian, Mr. Hari Dahal, Mr. Md. Masood Shahid, Mr. Sutrisno, Mr. P.P.G.W. Ratnasiri, Ms. Chutima Ratanasattien, Ms. Wande Jangkanipakul, Mr. Ty Channa

*Middle row left to right:* Mr. Md. Khalequzzaman A. Chowdhury, Mr. Vayaphat Thattamanivong, Mr. Norihiko Tomooka, Ms. Sangay Dema, Mr. Ye Tun Tun, Mr. Duncan Vaughan, Mr. Subash Dasgupta, Mr. Yasuro Funaki, Mr. Hiroyuki Tanaka, Ms. Fumiko Yaghashi

*Back row left to right:* Mr. Thong Ra, Mr. Masaru Takeya, Mr. Hisato Okuizumi, Mr. Ejji Domon, Mr. Tomotaro Nishikawa, Ms. Charlotte Lusty, Mr. Tolo Iosefa, Mr. Noov Bayarsukh, Mr. Stefano Diulgheroff, Mr. Shin-ichi Yamamoto.

*Photograph by Fumihito Yamasaki*



## **Bangladesh**

### **Final Summary Report on Project “Capacity Building and Enhanced Regional Collaboration for the Conservation and Sustainable Use of Plant Genetic Resources in Asia” GCP/RAS/240/JPN**

Md. Khalequzzaman A. Chowdhury  
Member-Director (Crops)  
&  
National Focal Point for the Project

#### **Introduction**

Plant Genetic Resources for Food and Agriculture are a highly important resource in all countries of the world and the Convention on Biological Diversity (CBD) has therefore declared that each nation has sovereign rights over their PGR within their territorial jurisdiction and has the right to protect the same under all circumstances. The Fourth International Technical Conference of the Food and Agricultural Organization (FAO) of the United Nations held in Leipzig, Germany in 1996 adopted twenty priority areas in the Global Plan of Action (GPA) for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture (PGRFA). The Conference also adopted the Leipzig Declaration, which focuses attention on the importance of plant genetic resources for the world food security, and commits countries to implementing the plan. Bangladesh, as a signatory to the CBD (1992) is committed to the implementation of GPA for Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture.

Bangladesh in fact, constitutes a large part of one of the Eight Centres of Origin and diversity of crop plants. Bangladesh is bestowed with immense agro-biodiversity of rice, jute, millets, legumes, a number of pulses and oilseeds, taro, yams, sweet potato, litchi, melon, citrus, mango, jackfruit, jamun, guava, banana and plantain, areca nut, coconut and *Zizyphus spp.* It also possess rich diversity in vegetable crops such as brinjal, okra, cucurbits, a number of leafy vegetable and spices crops. Diversity also occurs in several minor crops and fruits. There is also a good number of timber and medicinal plants indigenous to the country. Diversity also exists in the mangrove forests of the Sunderban. The usage of medicinal plants in Bangladesh has an ancient history. The diverse agro-ecological regions of the country have sustained rich genetic resources of crop plants, which are unique to the country. Continuous selection by the farmers and maintenance of promising types over a long period of time, have resulted in a large number of agro-ecotypes, adapted to various agro-ecological regions and growing conditions. Bangladesh is considered to be one of the centres of diversity of cultivated rice and many other crops. It has rich varietal diversity of landraces and wild rice. There are ethnic or tribal people living in Bangladesh who have also their own special rice for their own purposes. There are more than 160 crops grown in Bangladesh. Among these there are many major crops in Bangladesh that are beyond the list of major crops of Multilateral System of International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA). There are also about 100 minor crops, including fruits and vegetables that are grown in Bangladesh. The ever increasing population is demanding more pragmatic approach for conservation and utilization of the PGRFA in Bangladesh.

The world's genetic diversity is in danger of being lost with the advent of modern agriculture; locally adapted crop land races and traditional varieties have been replaced by the widespread use of genetically uniform high yielding varieties. The realization of the significance of plant genetic resources for food and livelihood security is increasing; the threat to their continued existence is growing day by day. Future progress in crop improvement and our food security depends to a great extent on immediate conservation of the rapidly vanishing crop genetic resources and their sustainable use by plant breeders. The lack of sound national plant genetic resources conservation strategies, sufficient funding and adequate trained human resources are the major impediments to proper management of plant genetic resources of the country. Considering the importance of PGRFA a project was implemented to enhance the capacity of national system for its conservation and sustainable use.

The project entitled “**Capacity Building and Enhanced Regional Collaboration for the Conservation and Sustainable Use of Plant Genetic Resources in Asia**” in the context of Bangladesh has been implemented under the financial assistance of Japan Government and managed by FAO Regional Office, Bangkok. The aim of the project was to strengthen capacity and collaboration related to information on Plant Genetic Resources for Food and Agriculture (PGRFA), particularly in relation to institutionalizing and regularly updating of NISM-GPA the main monitoring mechanism of the Global Plan of Action. The objectives of the project were as follows:

1. To update and extend information on GPA implementation in Bangladesh based on the National Information Sharing Mechanism (NISM),
2. To undertake national trainings/workshops with new and some previous stakeholders in the NISM to achieve an improved NISM system,
3. To undertake a series of other activities including data collection, compilation, and documentation to enhance capacity to sustainably conserve plant genetic resources in Bangladesh and enhance public awareness.

### **Project activity**

Bangladesh started project activity after signing of letter of Agreement between Bangladesh Agricultural Research Council (BARC) and FAO on 5 January 2010. Member-Director (Crops), BARC acted as National Focal Point of the project.

Firstly PGR related stakeholders were identified and selected for continuing PGR activities. Institutional Focal Point were identified among the participating organizations for smooth coordination of PGR activities. The following activities have been performed during the project period.

1. First Institutional Focal Points Meeting was held on 10 March, 2010. Filled the Global Plan of Action Questionnaire and discussed future plan of action. A Steering Committee was formed.
2. The first training-workshop on the NISM-GPA in Bangladesh was held 18-19 July, 2010. Stakeholders CD containing information on NISM-GPA was distributed and given an orientation to the new and old stakeholders on updating of existing database for NISM-GPA implementations and detailed briefing on the Common Tables.

3. A two-day long second training-workshop on the NISM-GPA database was organized by Bangladesh Agricultural Research Council on November 1-2, 2010. A total of 40 participants from 21 organizations (stakeholders) attended the programme.
4. Three review meetings with Institutional Focal Points were organized to review the progress of PGR related activities, identify the constraints and strengthening the capacity of national system for PGR. In one of the meeting, Dr. Duncan Vaughan, CTA was present. Moreover, several discussion meetings were held with individual organizations to review the progress of updating common tables.

## Organization involved with the Conservation of PGR

The organizations responsible for conservation of PGR are given below:

Sl. No.	Organizations	Responsibility
1.	Bangladesh Agricultural Research Council	Coordination and Policy
2.	Bangladesh Agricultural Research Institute	NARS; public research institute: Collection, conservation and utilization of crop genetic resources and breeders seed production.
3.	Bangladesh Rice Research Institute	
4.	Bangladesh Jute Research Institute	
5.	Bangladesh Sugarcane Research Institute	
6.	Bangladesh Institute of Nuclear Agriculture	
7.	Bangladesh Tea Research Institute	
8.	Bangladesh Forest research Institute	
9.	Bangladesh Livestock Research Institute	
10.	Cotton Development Board	
11.	Bangladesh Agricultural Development Corporation	Govt. seed multiplication agency
12.	Department of Agriculture Extension	Govt. extension department
13.	Bangladesh National Herbarium	Surveying and recording of germplasm
14.	Bangladesh Agricultural University	Teaching, variety development & collection, conservation & utilization of germplasm
15.	B S M R Agricultural University	
16.	Sher-E-Bangla Agricultural University	
17.	Dhaka University	
18.	Bangladesh Rural Advancement Committee	Seed business and variety development
19.	Lal Teer Seed Ltd.	
20.	Supreem Seed Ltd.	
21.	Ministry of Agriculture	Policy

## Project progress

Different organizations are working on collection, characterization and evaluation of different crops. But the work is still in preliminary phases in Bangladesh. Bangladesh Agricultural Research Council has established the National Network and is actively involved in facilitating the PGRFA activities. Some survey and inventory work have already been undertaken by stakeholder institutions/organization. More support is needed for strengthening and for widening survey and inventory work. This report on the NISM-GPA activities on PGRFA is the second one after 2007. There have been changes in the management of the information system as well

as the activities. It was mentioned that many of the stakeholders have no specific trained manpower to handle the PGRFA and the activities are conducted by experts/scientist of the plant breeding divisions. The project activities have supported progress of Bangladesh to incorporate updated information from present and new stakeholders into Bangladesh NISM-GPA database and strengthen PGR activities in Bangladesh. The updated information on 20 GPA Priority Activity Area of different stakeholders was synthesized and documented in the final report. The information generated on the issues of 20 GPA Priority Activity Areas' constraints and future needs have been reported.

The 20 GPA Priority Activity Areas were studied and summary of progress is given below.

**Table 1. Use of PGR by different stakeholder organizations during different periods (from 2007 to 2011)**

Stakeholder	Name of crop	No. PGR accessions reported in 2007	No. of PGR accessions in 2011	Breeding use of 2011 stock	Seed enhancement	Supply to others
BARI	Total (55 crops)	590	9 368	791	643	
BIRRI	Rice	6 259	7 290	665	7 290	6 790
BSRI	Sugarcane	902	1 091	325	6.1 tons	–
BINA	Total (11 crops)	627	1 666	416	487	–
BJRI	Jute	5 802	6 011	2 253	2 287	975
CDB	Cotton	490	467	60	5	Farmers
BSMARU	Total (13 crops)	547	547	–	–	–
BAU	Total (17 crops)	354	525	60	278	30 000
Lal Teer	Total (23 crops)	3 499	3 499	2 876	–	–

**Table 2. Varieties released by different stakeholder organizations during different periods**

Stakeholder	Name of crop	No. varieties released prior to 1996	No. of varieties released after 1996 up to 2007	No. of varieties released after 1996 up to 2011
BARI	Total (54 crops)	83	158	35
BIRRI	Rice	31	16	11 + 3 *
BSRI	Sugarcane	28	10	2
BINA	Total (11 crops)	10	29	16
BJRI	Jute	35	1	4
CDB	Cotton	2	12	1
BSMRAU	Total (crops)	02	20	01
BTRI	Tea	12	9	–
BAU	Total	06	31	36
SAU	Rapeseed	0	01	01
Lal Teer	Total (26 crops)	0	34	–

1. Updated information on accession numbers of PGR and that of varieties is provided (Tables 1 and 2). It is also observed that there has been some improvement in some of the 20 GPA activity areas in some of the crop species.
2. A NISM-GPA Implementation updated and extended.
3. A report on the status of the conservation and utilization of PGR in the countries, needs and priority for further work prepared.
4. A finalized report on the process of establishing and strengthening of the NISM-GPA Implementation prepared and made available to interested parties.
5. A data set with the information on the Indicators and Reporting Format on GPA implementation collected throughout the country made accessible to all stakeholders and other interested parties.
6. Capacity of scientists in managing PGR has been improved through training.
7. A web site of the NISM-GPA implementation was established ([www.barc.gov.bd/pgrf](http://www.barc.gov.bd/pgrf)).

### **The major constraints of the PGRFA activities in Bangladesh**

1. National comprehensive plan and GPS use-based survey, inventorying and collection have not been made. There have been project based isolated & independent survey and use but inventorying of sustainable conservation is not planned.
2. The most important constraint is the absence of national coordinating body such as National Plant Genetic Resource Institute (NPGRI) for definite prioritization of PGR with trained manpower and appropriate documentation of the PGR for its wide circulation to increase use.
3. Lack of national genebank for preservation of genetic resources.
4. There is weak coordination among the organizations working on PGRFA and CWR. The sharing of information is also absent resulting into isolated project approach and funding by organizations and donors.
5. Low level of awareness among most of the farming community about the economic and environmental value addition through conservation of PGR and non-availability of quality seeds and planting materials in the locality.
6. Limitations of funds and trained manpower.
7. Inadequate National Plan to assist farmers, to recover and preserve PGRFA following disasters.
8. Comprehensive Information System as well as the Monitoring and Early Warning system are not available in appropriate forms.

## **Priority Activity Areas for Bangladesh**

1. Establishment of National Plant Genetic Resource Institute (NPGRI) with a Genebank for conservation, use and enhancement of biodiversity with appropriate infrastructure for conservation of orthodox and recalcitrant seeds, vegetatively propagated materials, including facilities for a cryo-preservation and a DNA bank.
2. An assessment of genetic diversity, the rate and extent of PGR erosion and prioritization of PGRFA activities.
3. Development of a National framework and plan of activities on PGRFA for sustainable use of PGR.
4. Human resource development and capacity building in PGR in various fields that needs to be prioritized both for professionals and technicians.
5. To promote dissemination of information and national concern on biodiversity conservation through increased public awareness (including introduction of course curricula in PGR/biodiversity in educational institutions at different levels), with participation of farming communities, NGOs and other partners.
6. Drafting and enactment of policy and legal document (e.g. Biodiversity and Community Knowledge Protection Act; Plant Variety and Farmers Right Protection Act; policy on PGR).

## Bhutan

### Final Summary Report on Project “Capacity Building and Enhanced Regional Collaboration for the Conservation and Sustainable Use of Plant Genetic Resources in Asia” GCP/RAS/240/JPN

Sangay Dema  
National Biodiversity Center  
Ministry of Agriculture  
Serbithang, Thimphu, Bhutan

#### Background

Bhutan with its wide range of climatic and altitudinal variations within a small distance or area has allowed Bhutanese people from different ethnic backgrounds to grow a variety of crops and vegetable (BAP, 2009). Further, this relatively difficult terrain with isolated areas has allowed natural selection and localized adaptation of crops and crop relatives. Bhutan’s relative isolation from the other parts of the world until very recently has also provided an opportunity for Bhutanese farmers to select and develop their own locally adapted crops and crop varieties, resulting in a wide array of landraces and varieties in the country. For example, Bhutan has more than 280 landraces of paddy and more than 80 landraces of maize (NBC, 2008) and about 80 species of agricultural crops are expected to occur in the country (BAP, 2009). This diversity is significant for a country with less than 3% cultivated agriculture land from a total land area of 38,396 km<sup>2</sup> (LCMP, 2010).

Bhutan endorsed and signed the project “Capacity building and enhanced regional collaboration for the Conservation and Sustainable Use of Plant genetic Resources in Asia (GCP/RAS/240/JPN)” in November, 2008. A total budget of USD 22,100 was allocated for Bhutan to develop the National Information Sharing Mechanism on implementation of the Global Plan of Action on Conservation and Use of PGRFA.

The objectives for implementation of the above project in Bhutan were:

1. To **establish a NISM** on PGRFA and to **share information** related to PGRFA with stakeholders.
2. To **enhance coordination** of plans and activities on conservation and sustainable utilization of PGRFA in the country.
3. To assist **decision-making** process and priority setting on PGRFA conservation and sustainable utilization in the country.
4. To establish a **monitoring framework** for the National Biodiversity Action Plan implementation, particularly in relation to PGRFA, and GPA implementation at national level.
5. To aid in priority setting during the formulation of 3<sup>rd</sup> Biodiversity Action Plan, particularly in relation to PGRFA conservation and sustainable utilization and GPA.
6. To provide a basis for the preparation of the report on state of PGRFA in Bhutan and the state of world PGRFA.

Subsequent to the signing of the above project in 2008 and as per the framework of the project agreement, National Biodiversity Centre (NBC) was designated as the National Focal agency for the implementation of the project. Once NBC was designated as the focal agency for the project, the Centre developed a workplan for the project based on the activities identified in the project document towards implementing one component of the project – Development of National Information Sharing Mechanism for monitoring the Global Plan of Action for Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture. The letter of agreement endorsing the budget and work plan for the third year was signed in January 2011.

### **Brief status of GPA implementation in Bhutan**

The country report to FAO International Technical Conference on Plant Genetic Resources (Pradhan, 1996) is the only status report of the country's PGR submitted to FAO till now. In that report, although the country's overall plant diversity and general *in situ* conservation measures are reported, there is no specific mention of the *in situ* conservation initiatives for PGRFA *per se* in the country. However, since that report, Bhutan has embarked on many new conservation programmes in the country, including establishment of the National Biodiversity Centre (NBC) in 1998, with a mandate to coordinate overall biodiversity conservation activities in the country. Therefore, since the establishment of NBC, the Centre has initiated PGRFA conservation and development programmes, along with a dedicated division to coordinate the activities. Further, being party to the Convention on Biological Diversity and International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) has also enabled Bhutan to address most of the GPA activities. Therefore, since 1996, Bhutan has made significant progress in all areas of GPA for the conservation and sustainable use of PGRFA in the country.

Bhutan has conducted one major survey and inventory of field crops from 2002-2003. The inventory has covered at least one representative site from all the major agro ecological zones of the country. The results of the survey are published as "Plant Genetic Resources of Bhutan, Vol. 1: Field Crops, 2008. The Biodiversity Use and Conservation Asia Programme (BUCAP) has also carried out survey and inventory of traditional crops and crop varieties, specifically of rice and maize in all the projects sites. Other stakeholders (SHs) have inventoried many parts of Bhutan for other taxa such as mandarin, wild pear, wild kiwi and wild edible fruits. Comprehensive survey and inventory of horticultural crops are planned from 2012.

There are about 10 programmes and projects either completed or on-going for on-farm management and improvement of PGRFA in the country. Bhutan has also integrated and mainstreamed most of the PGRFA activities into the national programme.

In terms of supporting farmers in disaster situations to restore agriculture systems, although Bhutan has not faced such a situation to date, precautionary measures are already thought of and in place. For example, NBC has already initiated dialogue with the Department of Agriculture to establish a National Seed Reserve and three community seed banks are already established in the country. However, there is an urgent need to develop a national action plan to address the possibility of a PGRFA disaster.

Active programmes to promote *in situ* conservation of crop wild relatives and wild plants for food productions are yet to be initiated. However, since Bhutan has a strong conservation policy where more than 50% of the country is under a protected area system, crop wild relatives and wild food plants are conserved by default. In addition, plans to inventory and survey the crop wild relatives are already identified as a priority action in the Biodiversity Action Plan (BAP, 2009) and the National Action Plan for Biodiversity persistence and Climate change (NBC, 2010).

Bhutan has also made progress in *ex-situ* collections. Currently, the country holds more than 1,100 accessions covering 45 taxa in the national seed bank and field genebanks. Some progress has also been made in characterization and evaluation of the *ex-situ* collections. There are 20 projects/programmes involving 43 taxa on characterization and evaluation of PGRFA. However, except for rice, which has been evaluated for abiotic and biotic stresses to some extent, most taxa are characterized for only morphological traits. To increase genetic enhancement and base broadening efforts, crop breeding programmes are on-going for five crops, viz; potato, rice, maize, wheat and mustard. Nine programmes involving 10 taxa are completed/on-going for promotion of sustainable agriculture through diversification of crop and crop production system.

Bhutan has also initiated programmes to promote the development and commercialization of under-utilized crops. Currently, 17 under-utilized taxa are identified in the country, out of which nine are identified for medium priority for development and sustainable use.

The formal seed sector in the country is comparatively under-developed resulting in farmers facing problems of getting timely and affordable seeds/planting materials. In addition, despite government support for promoting local varieties, there are no firms multiplying and supplying seeds of local varieties. Therefore, there is need for interventions to improve the situation.

Policy documents such as the Economic policy development of Bhutan, 2010, Cooperative Act of Bhutan, 2009 and National Organic Programme strategy (Draft) support development of new markets for local varieties and diverse products. However, since these policy documents and strategies are still at the initial stage, only attempts such as promotion of organic farming, Biodiversity fairs/Food fairs and formation and strengthening of farmers' group to link scattered production are underway. Value addition and processing are initiated in rice, maize and buck wheat on a small scale while the National Organic Programme has initiated packaging and marketing of organic vegetables in two Dzongkhags namely Gasa and Bumthang on a small scale.

Bhutan recognizes the threat of genetic erosion and genetic vulnerability in the country and the need to assess them. There is a mechanism in place to assess genetic erosion for both *in situ* and *ex situ* collection. However, the lack of skilled personnel, appropriate technology and financial resources has limited the development of the monitoring mechanism and early warning system for loss of PGRFA. Linkage between the early warning systems and causes needs to be studied to develop appropriate interventions. Moreover, the concept of early warning system for the loss of PGRFA is new to Bhutan. Therefore there is a strong need to explain this concept and concurrently develop capacity to institute such a system. Monitoring and early warning systems for loss of PGRFA is crucial from the seed perspective. Currently 98% of the seed need is met from the informal sector or farmers' seeds and seeds from the formal sector accounts for only 2% of the total seed system. Therefore, loss of any indigenous crops and their varieties is likely

to cause many adverse effects on the seed system as well as on the food system, landscape, social and ecological system as a whole. Development of such a system is also crucial in this era of accelerated development which is further exacerbated by impacts of climate change.

Currently, a total of 77 staff members been trained through six training programmes addressing most of the GPA areas. However, due to the lack of training facilities and programmes nationally and regionally, there is still a shortage of trained manpower to deal with PGRFA in the country.

### **Threats to PGRFA diversity in the country**

- A. Displacement of indigenous landraces by new, genetically uniform cultivars.
- B. Switch from diverse cropping system to few market oriented cash cropping system.
- C. Environmental degradation and destruction of habitats due to urbanization.
- D. Wild animal damage.
- E. Drought/untimely rain/shortage of irrigation facilities.
- F. Banning of shifting cultivation.
- G. Low yield.
- H. Land clearing/landslides and habitat loss/soil erosion problem.
- I. Shortage of farm labor/rural-urban migration.
- J. Change of food/consumption habits.
- K. More buying power of consumers.

### **Constraints in the implementation of GPA on conservation and use of PGRFA**

The following are the recurrent constraints expressed by the SHs in their efforts to implement GPA-PGRFA activities.

1. Lack of adequate number of trained manpower.
2. Insufficient fund.
3. Insufficient infrastructure.

### **Conclusion and way forward**

The picture of current PGRFA activities in the country is not complete because of the above mentioned constraints in project implementation. However, as this is only the first attempt in the country in developing such a system where all PGRFA data would be available from one source, Bhutan is confident that it can move forward in developing and improving the system. However, to accelerate and facilitate development of a comprehensive and complete NISM for Bhutan, following actions need to be taken:

- Longer trainings for data managers of NFP and SHs.
- Dedicated staff for data management in all SHs.
- A standardized PGR database for all SHs, along with facilities such as dedicated computers for PGR database.
- More exposure and workshops for PGR researchers and programme manager on GPA for Conservation and Sustainable use of PGRFA, as well as on the importance of maintain and sharing information.

Since this project was the first attempt, the NISM data base could not be institutionalized within the SHs normal programmes. Therefore, in order to integrate the NISM database and the activities needed in populating, maintaining and improving the database, the above mentioned actions need to be implemented for which there is a need for 2<sup>nd</sup> phase project. Further, as indicated above, there is a need for enhancing awareness on the GPA itself and the use and importance of such an information sharing mechanism. As a national effort to maintaining and updating the NISM on PGRFA, the NFP would continue to collect data from SHs on annual basis and also integrate the NISM activities into the normal work programme of National Biodiversity Information Section of NBC.

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## Kingdom of Cambodia

### Final Summary Report on Project “Capacity Building and Enhanced Regional Collaboration for the Conservation and Sustainable Use of Plant Genetic Resources in Asia” GCP/RAS/240/JPN

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#### Introduction

On 7 July 2002 the Royal Government of Cambodia accepted the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA), which was approved by the FAO Conference at its 31<sup>st</sup> session in November 2001 pursuant to its Article 26 and undertook to abide by its provisions.

Plant genetic resources are considered an important part of cultural heritage, national identity and resources and thus a basis for food security and safety. The International Treaty on Plant Genetic Resources for Food and Agriculture is therefore crucial for the sustainable conservation of plant genetic resources’ and food security. For this reason, the government is actively engaged in addressing issues such as:

The development of plant varieties that can be adapted to different tastes and growing conditions;

How to elaborate a system where the richness of nature may be used for research and breeding programmes;

Adaptation of crops to changing environments and the challenges of increasing food production.

The Royal Government of Cambodia has a commitment to participating in international processes with the aim of sustainable development, germplasm conservation and sustainable use of genetic resources. To this end Cambodia is a Contracting Country to the “International Treaty on Plant Genetic Resources for Food and Agriculture” since this is also closely related with the fulfillment of the UN Millennium Development Goals.

The project “**Capacity Building and Enhanced Regional Collaboration for the Conservation and Sustainable Use of Plant Genetic Resource in Asia**” (GCP/RAS/240/JPN) is implemented by the FAO regional Office for the Asia and the Pacific. The project funded by the government of Japan aims (1) to promote the implementation of the twenty priority activity areas of the PGA for the conservation and sustainable utilization of PGRFA; and (2) to contribute to the establishment of a continuing monitoring framework of the GPA implementation at national and regional levels and a mechanism for gathering and sharing information, as well as for priority setting for the GPA implementation.

The Cambodian Agricultural Research and Development Institute (CARDI) became the project member after signing of LOA between CARDI and Food and Agriculture of United Nation (FAO) on November 17, 2009. The purpose of the project is aiming to strengthen capacity and collaboration related information on PGRFA, particularly in relation to institutionalizing regular

updating of National Information Sharing Mechanism of Global Plan of Action (NISM-GPA), the main monitoring mechanism of the GPA. The project activities are aimed to support Cambodia incorporate broad based and up-to-date information on PGRFA into the Cambodian NISM-GPA database and strengthen PGR activities in Cambodia.

CARDI has become the National Focal Point (NFP) institution. The project implementation of the NISM establishment, its outputs and findings are briefly presented in this report.

## **Overview of the Cambodia NISM-GPA establishment process**

The activities involved in NISM-Cambodia establishment process can be divided into three phases: preparatory, implementation, and reporting. The implementation of NISM-GPA involved stakeholders throughout the country. The information from relevant stakeholders was accumulated into the NISM database and their views were solicited during workshops and trainings.

### **1. Preparatory phase**

The CARDI started to identify stakeholders and review available data for incorporation into the NISM database after signing of LOA. The project's technical working group under the Training and Information Center of CARDI translated the technical documents of Indicator and Reporting Format for Monitoring the Implementation of GPA and the Guide "Towards the National Information Sharing Mechanism on the Implementation of the GPA" and its establishment in the Cambodian national language (Khmer) for distribution to stakeholders. Based on the translation of the Indicator and Reporting Format, the Khmer version of the NISM-GPA computer application was developed with the assistance from FAO.

On 18-19<sup>th</sup> January 2010 the project's technical working group participated in a training on the NISM-GPA at CARDI, instructed by the international Consultants, Dr. Duncan Vaughan and Dr. Rakesh Agrawal. The aim of this training was to explain how to use the National Information Sharing Mechanism software.

The first stakeholders meeting was held in June 2010, the purpose of this meeting is to raise the awareness of PGRFA and the GPA and to seek stakeholder's permission to carrying out the project's activities. In order to gain support for the above mentioned activity, the project published 3,000 copies of brochures and distributed them to the management of MAFF, Departments under MAFF, Provincial Departments of Agriculture, relevant institutions, libraries, NGOs and other targeted stakeholders. In total, 18 national stakeholders working on PGRFA were involved in the NISM-GPA establishment and identification of priority activity areas of the GPA. The needs of the stakeholders with respect to their participation in these activities were identified.

### **2. Implementation phase**

The activities during the implementation phase were organizing national SH meetings and workshops, data gathering, compilation, data analysis and homepage development on the Cambodian NISM-GPA. Therefore, the activities of the implementation phase are presented as below.

The first stakeholder meeting was held at CARDI in June 2010 and aimed to discuss the GPA objectives and review the 20 priority activity areas of GPA with relevant SHs. In total, 21 participants from 8 different and relevant institutions attended the meeting. The roles and responsibilities of stakeholders for NISM-Cambodia establishment were also defined. In order to measure the capacity and available facilities of each SHs for NISM-GPA establishment, a questionnaire for the 20 priority activity areas were translated in Khmer and provided to the participants to answer. Based on the results obtained, needs of SHs were identified and appropriate actions taken to assist the SHs to gather and compile data and information were refined, including direct individual training for SHs on the use of computer software.

The second stakeholder training-workshop was conducted on November 29-30<sup>th</sup>, 2011 at CARDI. This meeting is aimed to train the stakeholders on how to use the computer application of the Khmer version (Khmer-NISM-GPA), answer to the questions and add data to common tables of the indicators and reporting format for monitoring the GPA. The updated and revision of the nine “Common Tables” were discussed among SHs, and the stakeholder’s version of the computer application of the Khmer-NISM-GPA, with the information on the “Common Tables” was created for distribution to the stakeholders.

During the training-workshop, the project’s technical working group presented guidance on entering, editing and correcting data into the 9 common tables. Khmer-NISM-GPA software including software setting, registering, putting in, exporting out data, correcting, deleting and invaliding were practiced by stakeholders and trainers. At the end of training session, SHs registered to get CD-GPA software and the commitment of SHs to provide the data back to NFP.

The 3<sup>rd</sup> stakeholder meeting was held at CARDI, on February 9, 2011. The SHs are advised to make the presentation related to the data they compiled into the database of NISM-GPA software. The presentation includes the information in the Common Table, answering to the 20 priority activity areas and their difficulties. After that the participants reviewed and discussed the constraints. Suggestions were made regarding data collection and answering to the 20 priority activity areas of GPA.

The zip files were sent back to NFP and merged into the NFP’s main database for validation and creation the national database. Based on the data and information available, a draft synthesis report was prepared and presented to the SHs at the 4<sup>th</sup> workshop for their review and comments.

The 4<sup>th</sup> Training-Workshop on “The National Information Sharing Mechanism on the implementation of Global Plan of Action (NISM-GPA) for the conservation and Sustainable Utilization of Plant Genetic Resource for Food and Agriculture in Cambodia” was held at CARDI on 27-28<sup>th</sup> July 2011 with 36 participants form different relevant stakeholders attending this important Training-Workshop. The main purposes of the Training-Workshop were: to discuss and consult with stakeholders about the draft of final report on the Establishment of NISM-GPA for the Conservation and Sustainable Use of PGRFA in Cambodia, to review and revise the Cambodian NISM-GPA website before releasing the database on the internet and linking to the WISM site in FAO headquarters. Also to ask the permission of the SHs to link their institution’s website to Cambodian NISM-GPA site and to train the participants on how to use the Computer Application of NISM-GPA and how to search the information on PGRFA in Cambodian NISM-GPA and WISM databases.

### **3. Reporting phase**

The set of the 20 priority activity areas and common tables were exported to the Excel files for data management and data analysis. These files were used in the preparation of the draft report of the establishment of the NISM on the implementation of the GPA for Conservation and Utilization of PGRFA, and current state and priorities for the conservation and sustainable use of PGRFA in Cambodia.

The draft analysis report was prepared and discussed at the 4<sup>th</sup> SH workshop. This final analysis report included the views and comments from the workshop participants, and the report on the state of Cambodia PGRFA will be based on the information gathered through the NISM-GPA.

The project has developed a website on the NISM-GPA in Cambodia and the database has been placed on the website for access by SHs and other interested users. The information can be accessed through the internet address: <http://www.pgrfa.org/gpa/> then click on the Cambodian flag.

## **Data analysis and finding**

### **1. *In Situ* Conservation**

*In situ* conservation and development is one of the main importance of 4 priority activity areas of the GPA including (1) Surveying and Inventorying Plant Genetic Resources for Food and Agriculture, (2) Supporting On-Farm Management and Improvement of Plant Genetic Resources for Food and Agriculture, (3) Assisting Farmers in Disaster Situations to Restore Agricultural Systems and (4) Promoting *In Situ* Conservation of Crop Wild Relatives and Wild Plants for Food Production.

The activities related to *in situ* conservation of plant genetic resource or on farm conservation of native landraces diversity and Crop Wild Relatives (CWR) are almost nonexistent in Cambodia. According to the data provided by the SHs, the activities related to *in situ* conservation are very limited due to lack of facilities, man power to handle of plant genetic resources, and funds. Fortunately, Cambodia has protected area system that promotes *in situ* conservation. Cambodia has 23 protected areas covering 3.3 million ha (MoE, 2004) including seven national parks, ten wildlife sanctuaries, three protect landscapes and three multiple use areas (Jady Smith, 2004). The protected areas play a significant role in preservation of plant genetic resources, but these areas are poorly documented due to lack of research facilities, limited human and financial resources.

### **2. *Ex Situ* conservation**

PGR in Cambodia are poorly documented due to both the low human capacity and insufficient funding. Ex-situ collection is limited to rice genetic resources. In the early 1970s, 756 of traditional cultivars were collected and stored at the IRRI genebank (Sahai et al., 1992a). The next effort to collect rice germplasm was between 1989 and 1990 and 1270 accessions were collected (Sahai et al., 1992a). The third collection was carried out from 1990 to 1991, 348 accessions were collected from 13 provinces (Sahai et al., 1992b). And the fourth collection was implemented from 1992 to 1997 in 19 provinces, 939 of rice germplasm were collected

(Javier et al., 1999). So far a total of 3313 accessions are being conserved at CARDI and duplicates sent to the IRRI genebank for the long term conservation (Makara and Sophany, 2009).

The natural populations of many landraces and crop wild relatives are increasingly at risk of extinction or genetic erosion. They are being threatened primarily by habitat loss, degradation and fragmentation. Therefore, there is an urgent need to identify priority species and areas for conservation and to develop integrated *in situ* and ex-situ conservation strategies to ensure that the existing crop wild relatives are protected for the future economic growth and development. In response to this the CARDI Corporate Plan 2011-2020 was developed and the key research activities included conservation of PGRFA. Nevertheless, shortage of adequately trained technical staff, financial input and appropriate methodology are still the main constraints for Cambodia.

### 3. Use of plant genetic resources

Regarding data provided by stakeholders, the plant breeding division of CARDI plays an important role in the country in germplasm collection and conservation, variety development, variety testing and screening, and seed production/multiplication. Many landrace accessions have been directly or indirectly used in the breeding programme. Direct use refers to the use of local varieties through pure line or mass selection. More than thousand local varieties have been purified and tested across different growing conditions and over many years. As results, 38 rice varieties in total have been released for Cambodian farmers with adaptation to different agro ecosystems. For other crops, CARDI has released 4 varieties of mungbean, 3 varieties of mango, 2 varieties of tomato, 2 varieties of water-melon and 2 varieties of maize.

Each year, germplasm accessions from ex-situ collections are used for plant breeding purposes. Under several projects farmers have been trained and can practice line and population selection for recovery, testing, propagation, seed production and expansion of local varieties, especially of rice. Success in the development of the propagation procedure and transfer of improved cultivation techniques for some fruit and traditional plants also has helped promote PGRFA conservation and sustainable use, and crop seed production and supply. As a result, some local plants and varieties have been rescued, propagated and reintroduced into production. Indigenous knowledge relating to PGRFA has also been somehow studied in some projects sites for use in promoting PGRFA conservation, use and for crop seed production.

The Royal Government of Cambodia (RGC) has made a strong commitment to ensure further implementation of **the Rectangular Strategy-Phase II**, after successfully leading the Cambodian economy out of the most difficult time of recent global financial crisis and economic downturn. To this end, the RGC decided to embark on promoting the development of agriculture sector, with a new pace and scale, aiming at further strengthening the foundation for economic growth, accelerating poverty reduction, as well as improving the living standards of the Cambodian people.

In realizing the vision of agriculture development, the RGC has adopted a three-pronged strategy **productivity enhancement, diversification and agricultural commercialization** through implementing a package of interrelated measures: (1) infrastructure building and enhancement; (2) improvement in the provision of extension services and agricultural inputs; (3) land management reform; (4) finance; (5) marketing; (6) farmer organizations; and (7) institutional

building and coordination. Currently, agricultural commercialization has become more dynamic in light of global economic changes due to increasing food demand and prices. This trend has implications for agricultural revival and has provided an impetus for rice production as well as other crops in Cambodia, which have the potential for further increased productivity.

#### **4. Institution and capacity building**

The implementation of GCP/RAS/240/JPN, project activities for the establishment of the NISM-GPA plays an important role towards constructing a comprehensive information system for PGRFA in the country. Before this project's implementation, no information system on PGRFA existed in the country. The data was poorly managed and the information exchange was not promoted that is one of the important obstacles for promoting PGRFA conservation and sustainable use. Under this project, the key stakeholders were identified for information gathering, analysis, and compilation and reporting. Through the use of "Common Tables" and Reporting Formats provided by the project, data collected can be better standardized, systematized and managed. Also, the roles and responsibilities of SHs have been defined to ensure the successful establishment of the NISM-GPA.

Under the project GCP/RAS/240/JPN, workshops and training course were organized and significantly contributed to promoting public awareness in the country for PGRFA conservation and sustainable use. Also, 3,000 copies of brochures have been published for distribution and dissemination to all stakeholders.

Nevertheless, limited public awareness remains still a big constraint to most PGRFA activities. The main cause for this is the limited effort and concern spent for community trainings and efforts to raise awareness. A very limited number of forums exist on PGRFA related issues, and no trainings at all offered to farmers and communities; up to now most of the awareness raising activities were carried out under projects funded by foreign donors. There are no sustainable and strong national projects for conservation of PGRFA. Also, little information, education and communication (IEC) materials have been produced and introduced/distributed to the public. Moreover, the PGR issues have been very limited mentioned on both the central and local governmental mass communication channels.

The number of scientists/technicians has significantly increased in related areas. Each year, government staff members have been sent to other countries for capacity building in PGRFA conservation and sustainable utilization. A case in point, CARDI has a strong collaboration at both the regional and international levels to strengthen staff capacity in subjects related to gene bank management, germplasm collection, characterization and evaluation over the last 10 years.

#### **Lessons learned from the process of Cambodia-NISM establishment and GPA monitoring process**

The project has played an important role in increasing the ability of the country to assess the current status of Plant Genetic Resource and monitoring the GPA implementation in Cambodia. The project also helps the country to build a strong relationship among the stakeholders and enhance the capability of the country to meet international reporting obligations. Achievements during the NISM establishment are the following:

- The NISM-GPA is an important tool for information collecting and sharing and has been established in the country a database to facilitate monitoring of the GPA for conservation and sustainable use of PGRFA.
- Partnerships and collaboration between SHs have been strengthened within the country
- Awareness on the value of PGRFA conservation and sustainable use of PGRFA have improved and information disseminated.
- The past and present situations of PGRFA activities in the country have been reviewed, their achievements, limitations, constraints identified.
- The collections of data on PGRFA are systemized and made available widely to interested people.
- The comprehensive information system for Cambodia PGRFA has been produced and is link to the World Information Sharing Mechanism (WISM) and relevant sites both nationally and internationally.
- Recommendations and priorities set up for strengthening the 20 priority activity areas of the GPA were identified.

However, to sustained and continued for the long run NISM-Cambodia will be faced some problems such as:

- An inadequate budget for updating and maintaining the NISM
- The involvement from stakeholders is still limited
- The awareness of people on the value of PGRFA is also still limited
- The national network and ability for the implementation of NISM is also still limited.

Therefore, we strongly need the support from regional and international organizations and other donors for continuing and sustainable the implementation of NISM in Cambodia.

## India

### Final Summary Report on Project “Capacity Building and Enhanced Regional Collaboration for the Conservation and Sustainable Use of Plant Genetic Resources in Asia” GCP/RAS/240/JPN

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**Implementing Institution:** National Bureau of Plant Genetic Resources, IARI Campus New Delhi.

#### Progress

This phase is an extension of earlier project on establishment of the National Information Sharing Mechanism (NISM) on the Implementation of the Global Plan of Action (GPA) for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture (PGRFA) in India for the duration of two years from 2009 to 2011. In this Phase the project has been implemented in fifteen countries across Asia including Bhutan, Cambodia, Indonesia, Lao PDR, Mongolia, Myanmar, Nepal and Pakistan.

On behalf of Government of India, the letter of Agreement has been signed by the Department of Agriculture and Cooperation (DAC), Ministry of Agriculture, and as decided by DAC/ICAR, implementation of the project is being coordinated by NBPGR. The steering committee for the implementation of the project was constituted with joint secretary (seeds), DAC, Ministry of Agriculture, Government of India as Chairman and other members from ICAR, Department of Biotechnology (DBT), Ministry of Environment & Forests (MoEF).

The major stakeholders (SHs) identified to be included were:

- 1) ICAR (crop based) Instituted SAU'S.
- 2) Ministry of Agriculture, DAC/State Departments of Agriculture, Horticulture, Sericulture.
- 3) Ministry of Environment & Forests (MoEF)/Botanical Survey of India (BSI), State Department of Forests/State Bioiversity Boards.
- 4) Department of Biotechnology/National Bio-Resources Development Board.
- 5) NGO'S, farmers and other organizations involved in PGRFA activities.

## **PREPARATORY PHASE**

### **National Level Workshop**

To sensitize the identified Stakeholders (SH) for the execution of this project a workshop at national level was organized at NBPGR, New Delhi on April 17, 2010. Around seventy five SHs from different organizations attended the workshop. During the registration, the participants were provided with a GPA questionnaire asking them to rank three each of 'most important' and 'least important' activities out of 20 priority activities in national context. The participants were also given copies of the NISM report of Phase –I and the country report developed by India for the State of the World Report of FAO. They were also asked to suggest any other activity area(s) not covered in those 20 priority areas related to conservation and sustainable use of PGR.

## **IMPLEMENTATION PHASE**

### **Regional Workshops**

As compared to the first phase where the country was theoretically divided in three geographical regions for the purpose of collecting data and organization of regional workshops and one of the regional coordinators being from ICAR institute other than NBPGR Regional station, all trainings this time were arranged at NBPGR stations. This was decided keeping in view the smooth transfer of funds from NBPGR Delhi to its stations.

Six Regional Training workshops were organized for the stakeholders during May to July 2010. In total 120 stakeholders were trained in these regional workshops. During these training programmes, the broad objectives of GPA were explained and the brief about of the NISM project was also discussed by the PI during the presentation. The complete NISM software was demonstrated with the backup and export of data procedure. The participants were also given hands on practice and were provided NISM software CDs with the unique keys. The participants were requested to submit the data to the respective zonal co-ordinators. The breakup of stakeholders at each regional training was as follows.

#### **1. Regional Training workshop at NBPGR Regional Station, Thrissur**

The workshop was organized at Regional Station Thrissur on 19<sup>th</sup> May 2010. Fifteen stakeholders participated in the meeting including ICAR Institute (10), State Agricultural Universities (2), State Government (2) and traditional university (1).

#### **2. Regional Training workshop at NBPGR Regional Station, Shillong**

The workshop was organized at Regional Station Shillong on 11<sup>th</sup> June, 2010. Eleven stakeholders participated in the meeting including ICAR (8), NGO (2), and SAU (1).

#### **3. Regional Training workshop at NBPGR Regional Station, Ranchi**

The workshop was organized at Regional Station Ranchi on 26<sup>th</sup> June, 2010. Eight stakeholders participated in the meeting including ICAR (5), State Government (2), NGO (1).

#### **4. Regional Training workshop at NBPGR Regional Station, Shimla**

The workshop was organized at Regional Station Shimla on 3<sup>rd</sup> July 2010. Eighteen stakeholders participated in the meeting including ICAR (10), SAU (2), Govt. of India (5), CSIR (1).

#### **5. Regional Training workshop at NBPGR Regional Station, Hyderabad**

The workshop was organized at Regional Station Hyderabad on 9<sup>th</sup> July 2010. Thirty nine stakeholders participated in the meeting including ICAR (10), SAU (8), State Biodiversity Board (1), State Departments (8), Farmers (3), Private seed companies (5), NGO (1), Central Government (1), International Institutes (2).

#### **6. Regional Training workshop at NBPGR Headquarters, New Delhi**

The workshop was organized at NBPGR Headquarters, New Delhi on 30<sup>th</sup> August 2010. Thirty one stakeholders participated in the meeting including ICAR (21), SAU (5), Private seed companies (3), Traditional University (1), Central Government (1).

### **CONCLUSION PHASE**

At all the regional meetings stakeholders were requested to send the data in the requisite format after one month. Many queries were received after these trainings on export of data files from stakeholders and after troubleshooting advise from Dr. R.C. Agrawal, data from forty five (45) SHs has been received up to 10<sup>th</sup> October 2011. The data received is being merged, verified and analysed for preparation of the final report and submission to FAO.



*View of Regional training at New Delhi on 30 August 2010*

### **Development of the NISM Phase II Website**

NISM Phase II website of India was developed (<http://202.141.12.147/gpa/ind/main.htm>) to sensitize the stakeholders about the basics of NISM – GPA, Phase I activities and other details about the present project. The website also provides the search facility of the NISM information collected during the Phase I. The information will be updated along with search facility after the complete merge of the information of Phase II.

### **Future strategies for institutionalization of NISM**

1. The Indian Government has been requested to make financial commitment to the NISM-GPA in its 12<sup>th</sup> Plan projections.

2. Efforts are being made to integrate all PGRFA activities in the framework of a unified national programme in a project mode.

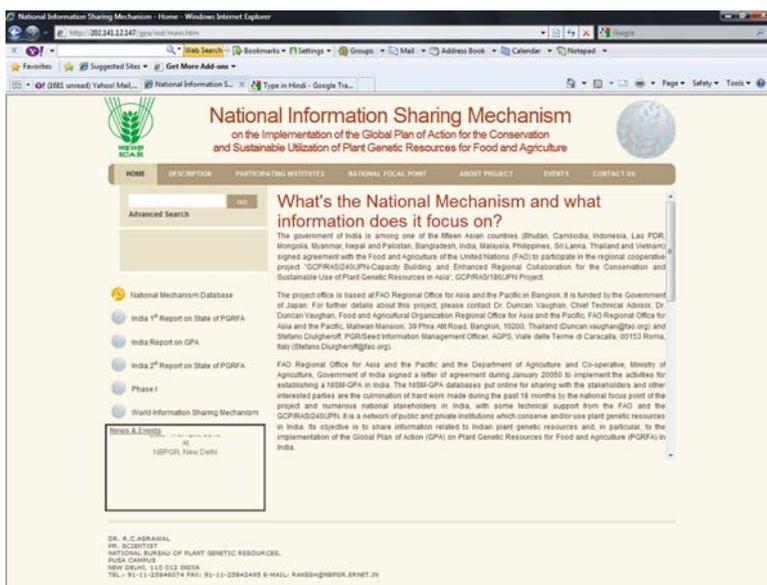
3. The Steering Committee is being reconstituted to the monitor and reviews the programme of NISM on regular basis. The Committee would hold periodic meetings to review the progress and suggest further action in this regard.

4. Efforts are on way to formalize the NISM in all stakeholder institutions to facilitate information gathering on PGRFA and exchange.

5. Participants of the 'Training Workshop' are being requested to train other colleagues in the use of the NISM-GPA Computer Application with the active support of the National Focal Point.

6. Nodal Officers are being instructed to report to the Directors/Heads of their organizations on the implementation of the GPA for PGRFA and provide regular updates to the National Focal Point and to send updated information on regular basis to NBPGR.

7. Public awareness are being promoted as much as possible in all PGRFA activities to target audiences and partners through appropriate channels in the country.



NISM Phase II website of India was developed (<http://202.141.12.147/gpa/ind/main.htm>)

## Indonesia

### Final Summary Report on Project “Capacity Building and Enhanced Regional Collaboration for the Conservation and Sustainable Use of Plant Genetic Resources in Asia” GCP/RAS/240/JPN

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Bogor

#### Background

All stakeholders at global and national level are interdependent for the conservation and utilization of plant genetic resources to fulfill the need for food, fiber, shelter etc. Therefore, it is essential to establish a mechanism to share information about the Global Plan of Action (GPA) on the conservation and utilization of plant genetic resources. The National Information Sharing Mechanism (NISM), developed by FAO, has been adopted by many countries, but Indonesia joined this activity just recently. The establishment of Indonesian NISM will facilitate to national and global stakeholders to obtain information about GPA\_PGRFA in Indonesia.

#### Process in the project implementation

**Participation in regional activities.** The National Focal Point (NFP) has participated in the first meeting of project GCP/RAS/240/JPN at FAO Bangkok in 2009. On this occasion the NFP learned of the previous similar project about the success and its constraints. The NFP also presented the existing information system on plant genetic resources in Indonesia. One person who led the working team project participated in the training on the basic operation of NISM software at FAO Bangkok soon after the NFP meeting. The NFP also participated in the 2<sup>nd</sup> NFP meeting at Chiang Mai in 2010. A representative of NFP will also participate in the final NFP meeting at Tsukuba in October 2011.

**Establishing advisory committee and working team.** An *ex officio*, Director of ICABIOGRAD has been appointed by Ministry of Agriculture to become NFP. The advisory committee (AC) consisting of three senior researchers was established by the NFP. The NFP and AC then established the working team (WT). During the first year, the working team consists of four persons, but at the second and third year the working team consists of seven persons.

**Translating computer application document into Bahasa Indonesia.** The NFP, AC, WT, two PGRFA experts worked on the translation of NISM software from English into Bahasa Indonesia. The translation is completed on September 2009 and sent to Dr. Stefano Diulgerhoff to generate the PDF CGRFA-10/04/Inf.5 document in Bahasa Indonesia and the new computer application of NISM which works both in English and Bahasa Indonesia.

## **Training and workshop on NISM software**

The national and local training workshop is conducted to explain about the establishment of NISM-GPA in Indonesia and to train stakeholders about the basic operation of the computer application for NISM-GPA. During the period of the project we have conducted three national training workshops and twice local training workshops. Out of 164 stakeholders invited, 78 stakeholders participated in the training workshops. However, at the end of the activity, only 35 stakeholders fully contributed in the NISM-GPA establishment. These stakeholders consist of Ministry of Agriculture (17), local government (5), non-government (3), university (5), Institutes of Science (2), and the private sector (3). Information on the twenty priority area of GPA has been collected from 34 stakeholders. However, less information obtained on priority area no. 15 (0 stakeholder), priority area no. 3 and 4 (one stakeholder), and the priority area no. 18 (two stakeholders).

**NISM database development.** NISM database has been developed by collecting data and information from 35 stakeholders and merged through GPANFP version mechanism. Common Tables, especially for Organization and Taxa tables were validated during the 3<sup>rd</sup> National Workshops.

**Public outreach.** Public outreach activities are needed to make public or stakeholders aware and concern about NISM-GPA of PGRFA. The activity includes developing leaflets, poster, booklet, presentation, and establishing NISM website.

## **NISM Database before and after the Project**

Before the project, out of nine common tables, there are no records for Cultivar Tables, Areas Tables, Infosys Tables, References Tables, and Agreement Tables. After the project, a significant increase on the number of record for 9 common tables has been documented through this project. Number of record has increased from 168 to 306 (Organization Tables), 91 to 740 (Contact person Tables), 14 to 422 (Project Tables), 75,634 to 75,728 (Taxa Tables), 0 to 355 (Cultivar Tables), 0 to 190 (Areas Tables), 0 to 7 (Infosys Tables), 0 to 195 (References Tables), 0 to 4 (Agreement Tables).

Thirty five stakeholders have contributed to the establishment of NISM Indonesia who consists of 15 research institutes under the Ministry of Agriculture, two departments under the Ministry of Agriculture, five local government, three non government organizations, five universities, three private sector organizations, and two research institutes under the Indonesian Institute of Sciences.

From the 35 stakeholders, we were able to collect information on 19 priority activity areas, but none for the priority area number 15. The priority area number 5 was contributed by the most stakeholders (20 stakeholders), follow by the priority area number 10 (19 stakeholders), the priority area number 13 (17 stakeholders), the priority area number 9 (16 stakeholders), the priority area number 7 and 19 (14 stakeholders each), the priority area number 6 and 8 (13 stakeholders each), the priority area number 20 (12 stakeholders), the priority area number 2 and 17 (11 stakeholders each), the priority area number 1 (10 stakeholders), the priority area number 14 (7 stakeholders), the priority area number 11 (6 stakeholders), the priority area number 12 and 16 (5 stakeholders each), the priority area number 18 (2 stakeholders), the priority area number 3 and 4 (one stakeholders each).

## **Conclusions**

The initiation in the establishment of NISM in Indonesia has been accomplished during 2009- 2011 with the support from GCP/RAS/240/JPN project through several activities. NISM-GPA database has been developed through the contribution of 35 stakeholders coming from government, university, NGO, and the private sector. NISM-GPA database contained nine Common Tables, that is Organization Tables, Contact person Tables, Project Tables, Taxa Tables, Cultivar Tables, Areas Tables, Infosys Tables, References Tables, and Agreement Tables. The information about 20 priority areas of GPA-PGRFA in Indonesia can be obtained through this NISM database. Leaflets, poster, and booklet about NISM-GPA have been produced and distributed at several occasions. A basic layout of NISM Indonesian website can be accessed at temporary address <http://www.biogen.litbang.deptan.go.id/nism/>

## **Recommendations**

The establishment of Indonesian NISM should be continued, since the sustainable enhancement NISM-GPA by many more stakeholders will give benefit to all stakeholders in the conservation and utilization of plant genetic resources.

## **Follow up**

To sustain the enhancement of Indonesian NISM, this activity will be merged with the activities of the National Commission for Plant Genetic Resources. The follow up activity will include keep contact with contributed stakeholders and FAO, continuing public awareness on the NISM-GPA, recruiting new stakeholders to joint the NISM, and explore funding for NISM's stakeholders for the implementation of GPA-PGRFA.

## **Acknowledgment**

We sincere thank to FAO and Government of Japan for the funding and the execution of GCP/RAS/240/JPN PROJECT "Capacity Building and Regional Collaboration for Enhancing the Conservation and Sustainable Use of Plant Genetic Resources in Asia".

## **Lao PDR**

### **Final Summary Report on Project “Capacity Building and Enhanced Regional Collaboration for the Conservation and Sustainable Use of Plant Genetic Resources in Asia” GCP/RAS/240/JPN**

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#### **Introduction**

Lao PDR has plentiful agro-biodiversity and Plant Genetic Resources for Food and Agriculture (PGRFA). These are an integral component of livelihood for Lao people. The population of Laos is constantly increasing and food security is an important issue.

Lao PDR ratified the Convention on Biological Diversity in 1996, and ITPGRFA – International Treaty on Plant Genetic Resources for Food and Agriculture in 2006. For implementation of the CBD and ITPGRFA, the government requested collaboration and support from international organizations. The support is financial but also helps with coherent planning and management to strengthened biodiversity awareness at different levels and among policy agencies.

Lao NISM-GPA is a critical activity to enhance collaboration and capacity building for the conservation and sustainable use of PGRFA, which was continually implemented since 2005 as a first initiative and second in 2007 by involving of relevant stakeholders from different government agencies. The objectives were to improve and strengthen Lao NISM-GPA existing and invalidated data, to build stakeholder capacity on NISM-GPA and to maintain the system.

#### **Beginning of the Project**

The government assigned the National Agriculture and Forestry Research Institute (NAFRI) as lead institute and the 2<sup>nd</sup> Phase started in 2009 to establish sustainable database, as a continuation of Phase 1 (started in 2007). In terms of project activities, a framework to validate and improve all existing data and to update all information was established. The 2<sup>nd</sup> Phase of NISM-Laos is to be linked with the World Information Sharing Mechanism (WISM). The database is available from the NAFRI website and linked to other information related to agro-biodiversity and food security databases in Laos.

#### **Process**

In September 2009, CAFRI was assigned to conduct the 2<sup>nd</sup> Phase of the Lao PDR NISM-GPA project (2009-2010) by NAFRI Director General. The project activities were developed and submitted to FAO-RAP. At CAFRI, Mr. Vayaphat Thattamanivong center director became the project National Focal Point and Mr. Manoluck Bounsihalath, head of ICT unit, became the database manager. Furthermore, NAFRI and steering committee agreed to have a specialist team from different research centers to help answering particular questions and assist with the validating process relevant to their expertise. There were many meetings and workshops

organized during the project implementation with many different purposes. Even though this was the 2<sup>nd</sup> Phase, most of the stakeholders were new to NISM-GPA and so the updating process took longer than expected but had beneficial results.

### **Main activities implemented:**

- Orientation workshop meeting of NISM-GPA Steering Committee, Specialists and Stakeholders
- Lao NISM-GPA user manual dissemination
- Lao NISM-GPA steering committee establishment
- Lao NISM-GPA specialists
- Specialist and stakeholder team improved and validated data on NISM-GPA of iteration 1
- Facility and equipment upgrading
- On the job training for Lao NISM-GPRFA database development
- Midterm review workshop on progress update and next plan
- Pre-final workshop and wrap-up project

### **Project Conclusions**

Lao NISM-GPA on PGRFA is much improved. This database is not only providing significant value for data management and information sharing but it is also giving more opportunity to stakeholders for further collaboration. Lao NISM-GPA is a ground-breaking information system on biodiversity in Lao PDR. Although, from many perspectives Lao NISM-GPA on PGRFA has intangible benefits from the investment, however in the long term the return from passing on PGRFA knowledge and information will have a positive impact to the world.

### **Main project achievements**

- As a result of these achievements, we can demonstrate the enhancement of the PGRFA situation on the chart and table summary (Annex II).
- In term of agriculture institutional cooperation on PGRFA conservation and natural resource management, a variety of complex issues needs to be brought up at a national level forum. For coherent planning and policy in across sectors, it is necessary to have a national assembly committee and particularly a national commission on biodiversity and food security in Lao PDR to assist in country development and land allocation. After Lao NISM-GPA has being promoted and demonstrated, this information support to biodiversity and food security will be critical for helping develop national management plans as a another dimension to PRGFA sustainable use and management system in Lao PDR (Annex I).

## **Sustainability and Future**

The commitment of Lao NISM-GPA stakeholders and the statement of Lao delegation in 13<sup>th</sup> ITPGFA conference for PGRFA show that Lao PDR is committed to sustainably conserve its PGRFA. Moreover now we have a basic PGRFA information system to support different agencies involved in agro biodiversity and food security.

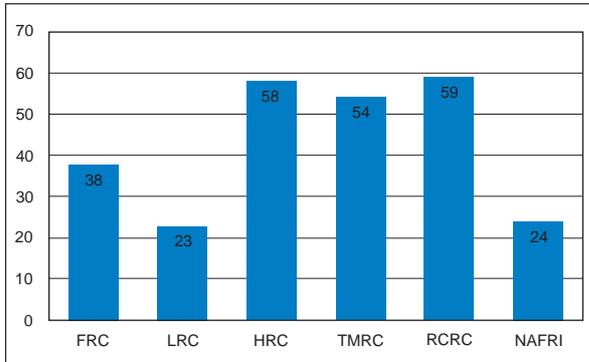
Consequently, to extend and expand Lao NISM-GPA by getting more SHs on board, the steering committee will have to think about capacity building and further collaboration. Food security and agricultural sustainability requires more support from national management and planning on natural resource management, and policies related to this issue.

## **Challenges and limitation on Lao NISM-GPA**

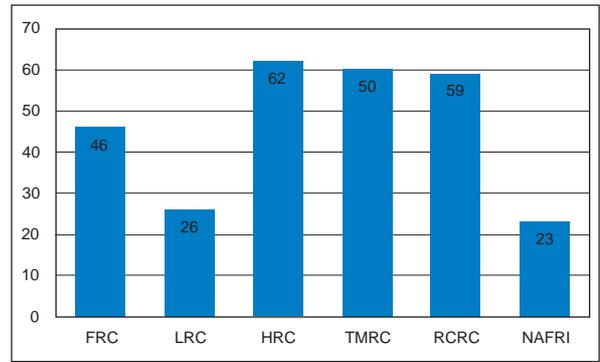
- Human resources are limited and stakeholders computer and English skills are very necessary to be involved with NISM;
- The 2<sup>nd</sup> Phase of Lao NISM-GPA 2009-2011 main tasks are validation and verification of existing data, with some update in the common tables of NISM-GPA;
- Generally, Lao PDR is mainly doing applied research and extension which means most of our activities are on *in situ* conservation only;
- Frequently, we lack agriculture specialists and scientists who can fully support information validation.

## Annex

### Annex I: Differences in stakeholder activity on PGRFA between iteration 1 and 2



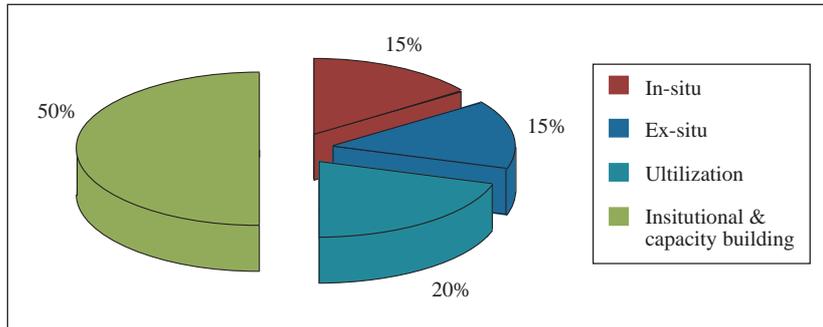
**Data validating on Lao NISM-GPA on 20 activity areas (1<sup>st</sup> iteration)**



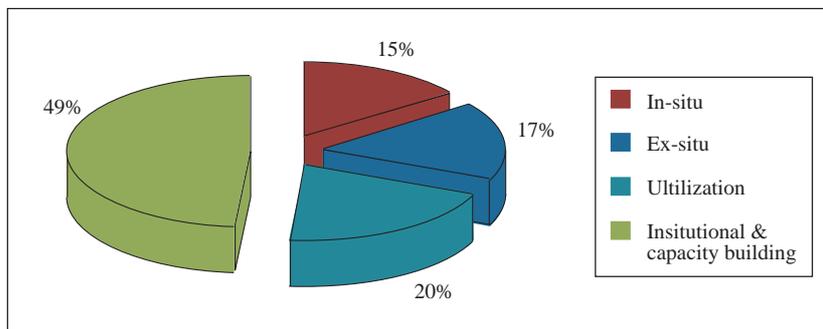
**Data validating on Lao NISM-GPA on 20 activity areas (2<sup>nd</sup> iteration)**

### Annex II: The status of PGRFA activity area of Lao PDR in Project iteration 1 and 2

#### Lao NISM-GPA on PGRFA activity



#### Lao NISM-GPA on PGRFA activity area



## Malaysia

### Final Summary Report on Project “Capacity Building and Enhanced Regional Collaboration for the Conservation and Sustainable Use of Plant Genetic Resources in Asia” GCP/RAS/240/JPN

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Malaysian Agricultural Research and Development Institute,  
Serdang, Selangor, Malaysia

#### Project activities and achievement

##### A. Verification, validation and enhancement of data in the National Information Sharing Mechanism

###### i) Technical task force (national team)

In 2011 there have been a few changes in the technical task force due to retirement and also study leave. In April 2011, there are new changes in the position of the National Focal Point and project leader. The new National Focal Point for this project is now Dr. Rosliza Jajuli and the new project leader is Ms. Erny Sabrina Mohd Noor.

###### ii) Holding a three days workshop to verify and validate existing data in NISM database

Three days training for verification and validation of existing data from the first iteration has been held on 19<sup>th</sup>-21<sup>st</sup> April 2010 in MARDI. It was attended by the technical task force team members. The team members identified duplicate data in NISM especially in project tables. A total of 51 projects were duplicated in the 711 projects listed. The duplicate data was then invalidated. Some translation of project titles from Malay to English was also being done. This involved 72 projects in the project table. The new verified data is now being uploaded into the database and visible for viewers in the NISM Malaysia website.

###### iii) One day workshop with stakeholders from Sabah, East Malaysia

A one day NISM database workshop was conducted on the 20<sup>th</sup> July 2011 in MARDI Kota Kinabalu, Sabah which was done back to back with the public awareness programme in item B (i). Stakeholders were given a brief introduction on the NISM-GPA database. The facilitators and technical task force team assist the stakeholders to install the software and also explain on type of data needed to be filled in the various common tables and other matters related to answering the GPA questions and also how to generate the zip file.

**Facilitators:** Dr. Rosliza Jajuli

Ms. Erny Sabrina Mohd Noor

**Participants:**

- a) Mr. Haya Ramba – Malaysian Cocoa Board
- b) Mr. Pountis Gumail – Department of Agriculture Tenom, Sabah
- c) Ms. Jacqueline Joseph – UiTM, Kota Kinabalu, Sabah

**iv) NISM database workshop with stakeholder from MARDI**

A one day workshop on NISM database was conducted with stakeholders from MARDI on the 18<sup>th</sup> August 2011 in Strategic Resource Research Centre, MARDI, Serdang, Selangor. Stakeholders which came from a few different centers in MARDI were given a brief introduction on the NISM-GPA database. They were also assisted to install the NISM software to their personal computers and also being explained on different common tables and data needed.

**Facilitators:**

Ms. Erny Sabrina Mohd Noor

Dr. Rosliza Jajuli

**Participants:**

- a) Ms. Noor Syahira Nasarudin – Rice and Industrial Crop Research Centre, MARDI
- b) Ms. Suhaina Supian – Biotechnology Research Centre, MARDI
- c) Ms. Faizah Salvana Abd Rahman – Seed, Livestock and Planting Material Unit, MARDI
- d) Dr. Abdul Rahman Milan – Horticulture Research Centre, MARDI
- e) Ms. Maya Izar Khaidizar – Strategic Resource Research Centre, MARDI
- f) Mr. Noor Hisham Mohd Zainal Abidin – Strategic Resource Research Centre, MARDI Seberang Prai, Penang
- g) Mr. Razali Mirad – Strategic Resource Research Centre, MARDI

**v) The Malaysia NISM website**

The Malaysia NISM website had been enhanced with new information and new appealing look to catch the attention of more viewers and new stakeholders.

**vi) Status of the 2<sup>nd</sup> iteration NISM**

The 2<sup>nd</sup> iteration involved most of the previous stakeholders in iteration 1 with additional with several new stakeholders. The lists of stakeholders are as listed in annex 1.

**B. Public Awareness****Seminar series held across all of Malaysia to introduce and inform about PGR and NISM in Malaysia**

Posters and oral presentation were given out during several conferences/seminars. Pamphlets, brochures and information were distributed during exhibition from information kiosk for public awareness on the NISM database and other related matter. Some of exhibition and conferences attended are as follows:

- MARDI 40 year's celebration on 15-17 March 2010 in Serdang, Selangor
- Second National Conference on Agrobiodiversity on 11-13 May 2010 in Tawau, Sabah
- 2<sup>nd</sup> International Biotechnology and Biodiversity Conference (BioJOHOR) on 6-8<sup>th</sup> July 2010 in Johor Bharu, Johor
- Crop for the Future Symposium on 27<sup>th</sup>-30<sup>th</sup> June 2011 in Kuala Lumpur.
- National Horticulture Conference on 18<sup>th</sup>-20<sup>th</sup> October 2011 in Melaka (paper has been submitted and accepted)

In order to introduce NISM and to promote PGR conservation and utilization, we also conducted public awareness seminar as follows;

**i) Public Awareness Seminar on Rules and Regulation Related to the Conservation and Utilization of Plant Genetic Resources for Food and Agriculture (PGRFA) in Sabah on 19<sup>th</sup> July 2011.**

Topics covered:

- a) The Role of International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA) in the Conservation, Utilization, Access and Benefit Sharing of Plant Genetic Resources by Mr. Lim Eng Siang, Honorary Research Fellow (Bioversity International, APO).
- b) Nagoya Access and Benefit Sharing (ABS) Protocol: Analysis & Implementation Options by Prof. Gurdial Singh Nijar (CEBLAW, University Malaya).
- c) Biotechnology Patenting and Plant Variety Protection by Prof. Michael Blakeney (University of Western Australia).
- d) National Information Sharing Mechanism (NISM) as a Tool on the Implementation and Monitoring of GPA for Conservation and Sustainable Utilization of PGRFA by Dr. Rosliza Jajuli (MARDI).
- e) Introduction to New Plant Variety Act 2004 PVBT Act 2004 by Mr. Noorazmi Yahya (Department of Agriculture, Putrajaya).

The public awareness seminar was attended by 38 participants from MARDI, Department of Agriculture Sabah, Department of Agriculture Sarawak, Universiti Teknologi Mara (Kota Kinabalu Branch) and Malaysia Cocoa Board. Various issues on rules and regulation concerning PGRFA were discussed especially on topics Access and Benefit Sharing and also on New Plant Variety Act 2004.

**C. Mainstreaming the GPA and NISM into National Policy and Strategies**

**1. Agrobiodiversity Strategies and Action Plans Stakeholders Meeting/ Workshop.**

Several meetings were arranged to gather ideas and information on the PGRFA status, gaps, issues and challenges in Malaysia with the stakeholders. The National Strategies and Action Plan (NSAP) of Agrobiodiversity Workshop had been organized in Le Paris Hotel & Resorts, Port Dickson on the 11<sup>th</sup>-13<sup>th</sup> April 2010 to finalize the NSAP. The blueprint of the NSAP of Agrobiodiversity

had already been approved by Ministerial Cabinet member. The blueprint is now ready for consent of National Biodiversity and Biotechnology Council (MBBN) chaired by Deputy Prime Minister. Once the blueprint presented to the council member, the document will officially launched at national level.

2. Publication of a book entitled “Conservation and Utilization of Plant Genetic Resources for Food and Agriculture in Malaysia”. This book was prepared to highlight the progress made by the country in implementing the GPA for the conservation and utilization of PGRFA. All stakeholders/institutions involved in this project were provided with two copies of this book. This book is the report for the previous project GCP/RAS/186/JPN.

#### **D. Capacity Building of PGRFA**

- i) **Microtechnique and Molecular Analysis Training** was conducted on 29-30<sup>th</sup> March 2011 at Microtechnique Laboratory and Molecular Laboratory, Strategic Resources Research Centre, MARDI Serdang. This 2 days training was organized in order to give the participants for this training the basic knowledge and hands-on training in basic characterization of plant taxonomy – anatomy and molecular part. 12 participants took part in this training. Most of the participants are support staff of Strategic Resources Research Centre and also some students from Universiti Kebangsaan Malaysia (UKM).
- ii) **Basic Techniques in Photography Workshop** was conducted on the 15<sup>th</sup> May 2011 at Strategic Resource Research Centre, MARDI, Serdang. This one day workshop was organized in order to give basic knowledge and hands-on training in photography techniques. A total of 30 participants which consist mostly of support staff from Strategic Resource Research Centre and Horticulture Research Centre MARDI took part in this training. The training was given by Mr. Arase Sugawara, a professional photographer from Malaysian Photo Services.
- iii) **Capacity Building on the Management of PGRFA (Series 1)** was conducted on 7 June 2011 in MARDI, Serdang, Selangor. There are 4 papers were presented in this seminar by relevant speakers i.e., Dr. Duncan Vaughan (FAO), Dr. Salma Idris (MARDI), Prof. Wickneswari (UKM) and Dr. Mohd Shukri Mat Ali (MARDI). Various topics in management of PGRFA were covered to enhance capacity, disseminate knowledge and information related to PGRFA.
- iv) **Capacity Building on the Management of PGRFA (Series 2)** will be conducted on 1<sup>st</sup>-2<sup>nd</sup> November 2011. Suitable speakers for this seminar have been identified, which covered on the field genebank; techniques, survey and inventories of PGRFA; cryopreservation; regeneration techniques and ethnobotany.

#### **Acknowledgement**

We would like to acknowledge the financial and technical support by the Government of Japan and FAO (Food and Agriculture Organization) for the implementation of project GCP/RAS/240/JPN.

## Annex 1

List of stakeholders involved in NISM-GPA 2<sup>nd</sup> Iteration in Malaysia

1. Department of Agriculture (Peninsular Malaysia)
2. Forestry Department (Peninsular Malaysia)
3. Department of Agriculture (Sabah)
4. Department of Agriculture (Sarawak)
5. Department of Agriculture (Kelantan)
6. Malaysian Cocoa Board
7. Lembaga Kemajuan Wilayah Kedah (KEDA)
8. Malaysian Nuclear Agency (MINT)
9. Biotechnology Division, Forest Research Institute Malaysia,
10. Malaysia Palm Oil Board
11. Sabah Park
12. Department of Forestry Sabah
13. Malaysian Rubber Board
14. Environmental Sciences and Natural Resources Research Centre, Science and Technology Faculty, Universiti Kebangsaan Malaysia
15. Faculty of Agriculture, Universiti Putra Malaysia
16. School of Biological Science, Universiti Sains Malaysia
17. UiTM (Kota Kinabalu Branch)
18. School of Science and Technology, Universiti Malaysia Sabah
19. Faculty of Resource Science and Technology, Universiti Malaysia Sarawak (UNIMAS)
20. Faculty of Applied Science, UiTM
21. Rice & Industrial Crops Research Centre, MARDI
22. Horticulture Research Centre, MARDI
23. Strategic Resources Research Centre, MARDI
24. Seed, Livestock and Planting Material Unit, MARDI\*
25. Biotechnology Research Centre, MARDI\*
26. Malaysian Croplife & Public Health Association
27. Third World Network
28. Sarawak Biodiversity Centre
29. Sabah Biodiversity Centre
30. Agrotechnology Department, Faculty of Agrotechnology and Food Science, Universiti Malaysia Terengganu.

31. School of Biosciences, University of Nottingham (Malaysia Campus)\*
32. Institute of Biological Sciences, Faculty of Science, University of Malaya\*
33. Agro Industry and Natural Resources, Universiti Malaysia Kelantan\*
34. Faculty of Agriculture and Biotechnology Universiti Sultan Zainal Abidin\*
35. University Malaysia Pahang\*
36. International Islamic University Malaysia (Kuantan Branch)\*
37. Sime Darby Seed R&D Centre\*
38. Sime Darby Research Sdn Berhad\*

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\* additional new stakeholder in 2<sup>nd</sup> iteration

## **Mongolia**

### **Final Summary Report on Project “Capacity Building and Enhanced Regional Collaboration for the Conservation and Sustainable Use of Plant Genetic Resources in Asia” GCP/RAS/240/JPN**

Noov Bayarsukh

Deputy Director

Plant Science and Agricultural Research Training Institute (PSARTI)

#### **Preparatory phase**

##### **Translation of NISM-GPA software**

In the preparatory phase a full document of NISM software using Excel tables was translated into the Mongolian language and the translation converted into unicode (Word format and PDF) using the online converter found at <http://badaa.mngl.net/convert/con2uni.htm>.

Finally the installer of the Mongolian-English version of the GPANFP application completed in December 2009 with the full support and involvement of Mr. Stefano Diulgheroff, FAO AGP.

##### **Establishment of LOA and preparation of manuals**

The LOA/2009/262 established between FAO and PSARTI on 8 November 2009. The PSARTI referred to as recipient organization. The LOA indicated the responsibilities and roles of both parties for the establishment of NISM-GPA in Mongolia.

The manuals and CD containing information about GPA, project and instructions filling common tables in Mongolian language are distributed to relevant authorities and specialists of Ministry of Food Agriculture Light Industry (MoFALI), Ministry of Nature, Environment and Tourism (MNET), research organizations, universities and NGOs.

Two sets of computers, printer and color scanner were purchased to enable efficient data collection and management for the NISM-GPA Mongolia.

It was very useful to purchase a notebook computer for the project documentation specialist and he was able to collect information and directly input to the system.

##### **Training of documentation specialist**

The project team composed of NFP and documentation specialist and research staff of PGR division of PSARTI was established. The full time new documentation specialist was hired for implementation NISM-GPA in Mongolia.

The national focal point (NFP) provided training to the documentation specialist and other researchers at PSARTI for the use of NISM-GPA. During training the documentation specialist provided guidelines and hands on training on the use of NISM-GPA including access to the

programme, filling in of common tables, data export and import, data validation, creating new records, searching, registration of SH and creation of CD to SHs, linking and data merging etc.

## **Implementation phase**

### **Survey and selection of stakeholders**

The project team conducted a survey of organizations which are involved in conservation and sustainable use of plant genetic resources for food and agriculture in Mongolia by surveying projects, programmes, publications, reports, through the internet and meetings with organizations and officials.

Also, we sent an official request to the State Central Registration Department (SCRD) of Mongolia asking for a list of government and non government organizations which conduct activities related to conservation and sustainable use of PGRFA. In response, we received list of organizations which are registered to conduct environmental research activities in Mongolia. Finally we were able to develop list of 31 organizations which may be involved in activities related to conservation and sustainable use of PGRFA in Mongolia.

From the above organizations we selected 18 organizations which are involved in the conservation and sustainable use of PGRFA.

We prepared a 6 page manual containing information about the project objectives, activities and expected results of NISM-GPA Mongolia and guidelines for filling in common tables. Also, the common tables were exported into excel sheets and recorded into a CD. The guidelines for filling in common tables, CD together with official invitation to join in the establishment of NISM Mongolia were distributed to the selected 18 organizations.

Finally we received response from 14 stakeholders that agreed to join in the establishment of NISM-GPA in Mongolia.

### **Gathering stakeholders data and filling common tables**

The common tables including PROTAB, CULTAB, REFTAB, PERTAB and AGRTAB were exported from NISM software to excel sheets and distributed to each SHs with instructions to fill common tables and recommendations.

The NFP and project team had regular communication with SHs through means of telephone, e-mail and other communication tools to assist filling in the common tables.

During implementation of project we found that there are several reasons of slow process of filling the common tables by other SHs: 1) in summer most researchers work in the field or on missions and focal person doesn't have much time to spend on NISM 2) focal person at selected organization didn't have all information so they need more survey at the institutional level.

Therefore, the project documentation specialist visited to selected SHs and assisted them in filling common tables. It was very helpful to purchase notebook for project documentation

specialist and he was able to visit SHs, collect information and directly input the data into the system.

At the same time the documentation officer and other PGR staff of PSARTI visited to the Central State Library of Mongolia, Library of Mongolian Academy of Sciences, Library of Institute of Botany and Central Library at Science and Technology Foundation Mongolia and gathered necessary information for reference and project tables.

We found that some of valuable information mostly related to international collection mission has been lost during transition period from the communist regime to market economy in Mongolia.

The data of the SHs for each table were merged and imported into existing file in the NISM-GPA computer programme. After the successful merging and entering of available data from SHs into existing Common Tables the SHs NISM-GPA computer application then created. The individual SH key code and copies of SHs NISM-GPA computer application on CD are provided to each 14 SHs.

During project implementation the 14 organizations provided information for the common tables namely PERTAB-390, PROTAB-174, TAXTAB-75634, CULTAB-157, ARETAB-64, SYSTAB-3, REFTAB-1262, AGRTAB-66.

### **Answering questionnaire and data validation**

Each stakeholders required to provide answers on how to address implementation status of each of twenty priority areas of GPA.

Only 4 SHs including PSARTI, RIAH, DARPC, WRARI and Altai Regional branch of MSUA were able to send the zip files containing the answers to the questionnaire for data merging into the NFPs version of NISM-GPA Mongolia. Other SHs required technical and logistical assistance for answering to the questionnaire and the NFP and team prepared guidelines on how to answer the questions in Mongolian language and distributed that to SHs. The SHs sent answers on MS format and the PSARTI documentation specialist entered most of answers into system. The SHs need regular training and assistance working on the NISM system for entering new data and updating.

The individual SHs data merged into NFPs database using NFPs version of NISM-GPA application programme. During merging the SHs data the all data were checked and duplicate entries were rejected.

Finally, validation of data from SHs was conducted through visits, contact by phone and e-mail communication.

### **Organization of first SHs meeting**

The first stakeholders (SHs) consultation workshop held on 17 June 2010 at the Mongolian State University of Agriculture (MSUA) in Ulaanbaatar. Totally 30 participants representing 13 stakeholders attended the meeting.

The officials including Mr. L. Bayartulga, Head of Department of coordination of agriculture policy implementation of MoFALI, Mr. Ch. Buyannemex, FAO representative, Dr. A. Gombojav, vice president of MSUA took part in the meeting.

The objectives of the workshop were to 1) develop strategy for the establishment NISM-GPA in Mongolia 2) define roles and responsibilities of SHs 3) train SHs on the use of NISM-GPA software.

The resource persons including Dr. N. Bayarsukh, deputy director of PSARTI and national focal point (NFP), Dr. G. Erdenejav, senior scientist of the Institute of Botany, Dr. J. Namjilsuren head of PGR division PSARTI, Dr. Tserenbaljid, senior scientist of the Institute of Botany made 5 presentations during workshop. The presentations covered topics related to the current status of conservation and utilization of plant genetic resources in Mongolia.

An introduction and workplan for the establishment of NISM-GPA was presented by Dr. N. Bayarsukh and discussed by stakeholders.

Mr. B. Otgonbayar, the project documentation specialist provided presentation on the use of NISM-GPA software and hands on practice on the use of software using computers provided to participants.

During the workshop participants agreed on workplan for NISM-GPA implementation in Mongolia and the roles and responsibilities of NFP and SHs.

Participants agreed that depending on SHs experiences on the use of NISM computer software the SHs can submit information to common tables on excel sheet or data file.

The CD containing the installation programme of GPASH and manuals for GPASH in Russian and Mongolian language and Global Plan of Action on PDF files developed. Also, the manual consisting of 6 parts, containing 42 pictures in 28 pages printed in Mongolian language and distributed to stake holders during first SHs meeting.

**The second SHs meeting was organized** on 25 July at PSARTI. The participants including 12 SHs who are actively participating to establishment of NISM and in addition the staff from National Committee on Bio-security of Mongolia took part to the meeting. During this second meeting, the participants had hands-on training and practice on answering the questionnaire using the NISM-GPA computer application and introduced using the Microsoft Excel software needed for submission of the common tables.

Also participants discussed achievements, constraints and suggestions for the improvement of NISM and institutionalizing NISM in Mongolia.

### **Steering committee of the NISM-GPA**

The participants of first SHs meeting agreed to create project steering committee consisting of representatives of authorities and core research institutes including Mr. L. Bayartulga, Head of Department for Coordination of Policy implementation in Crop production of MoFALI, Dr. N. Bayarsukh, deputy director PSARTI and National Focal Person, Dr. Namxaiseniou researcher from RIAH, Dr. G. Erdenejav, senior researcher Institute of Botany and Mr. B. Otgonbayar, researcher documentation specialist from PSARTI.

The Head of Department for Coordination of Policy implementation in Crop production of MoFALI chairs the Steering Committee and National Focal Person (NFP) serves as the Secretary. SHs agreed on the schedule of submission of the information of the NISM to the NFP.

## **Reporting Phase**

The progress report of implementation of NISM-GPA Mongolia generated by NFP and sent to project CTA every 6 months.

The draft of final report prepared by NFP and distributed to steering committee members as well as to selected SHs who actively involved in the establishment of NISM – Mongolia for review and comments. The comments from steering committee members and some SHs included in the report and finalized by NFP.

Based on the data and information gathered through this project the steering committee recommended to NFP to compile the “The State of PGRFA of Mongolia”.

The project developed a website on the NISM-GPA Mongolia. The information can be accessed through the internet.

## **Conclusions**

The project on the National Information Sharing Mechanism in the Monitoring of the Implementation of the GPA in Mongolia was implemented successfully and has been very useful project.

This has provided opportunity to assess current status of conservation and utilization of PGRFA in Mongolia.

The project result have revealed the key research organizations, individuals, projects and activities relevant to collecting, conservation and sustainable utilization of PGRFA, the status of responsible government organizations for conservation of PGRFA and their relations, the legal status of PGR conservation and constraints and opportunities.

This database will help for setting priorities, responsibilities of relevant organizations, designating the national focal body and effective planning of projects and activities relevant to PGRFA in the future. It will also contribute to policy makers, farmers, researchers, government organizations and the public to get an overview about the current situation of conservation and utilization of PGRFA.

Based on the information gathered it can be concluded that the current status of activities on conservation and utilization PGRFA in Mongolia is rather weak.

**The lack of appropriate policy and priority in PGRFA, the irrational government policy that agricultural research institutes belong to MECS, the insufficient funding and lack of technical capability, equipment and laboratory facilities especially for germplasm storage and characterization of PGRFA, lack of competent, experienced staff are the main limiting factors in conservation and utilization of PGRFA and the support from regional and international organizations needed.**

Whereas, the survey, inventory and conservation activities of natural PGR in the country are done quite sufficiently and the legislation and regional and international collaboration are relatively well coordinated in natural plant genetic resources by the MNET. The report of the project with appropriate recommendations will be submitted to relevant ministry and other government agencies and policy makers in the country. This will contribute to strengthen activities relevant to conservation and sustainable utilization of PGRFA in the country.

The PSARTI, as key implementing institution of NISM-GPA Mongolia would like to maintain and continue to improve and update the database under the local project on crop genetic resources by the MOFALI. The permanent staff for genebank database management will be responsible for continued updating and improvement of the system.

## Myanmar

### Final Summary Report on Project “Capacity Building and Enhanced Regional Collaboration for the Conservation and Sustainable Use of Plant Genetic Resources in Asia” GCP/RAS/240/JPN

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#### Introduction

The Global Plan of Action (GPA) represents an important contribution to the implementation of the Convention on Biological Diversity (CBD) in the field of Plant Genetic Resources for Food and Agriculture (PGRFA). GPA is one of the important supporting elements of the International Treaty on Plant Genetic Resources for Food and Agriculture (ITPGRFA). There are 20 priority activity areas in the GPA that are organized into four groups: (1) *In Situ* Conservation and Development, (2) *Ex Situ* Conservation, (3) Utilization of Plant Genetic Resources, and (4) Institutions and Capacity Building.

Plant and crop diversity in Myanmar reflects its location between tropical South and temperate East Asia and diverse ecological factors in the country. In addition, more than one hundred diverse ethnic groups have lived in Myanmar since long ago. The interactions between human and ecological factors have resulted in the rich diversity of crop landraces, such rice, soybean, mango, yam, and banana, in Myanmar.

Recognizing the important role of plant genetic resources for the survival of present and future generations, there had been several efforts to conserve and utilize the PGR by diverse stakeholders, and institutions within Myanmar. However, these efforts are not integrated or coordinated as national programmes even within the same organization. Therefore, PGR conservation and utilization efforts need to be complementary or coordinated both at national and international level to achieve the common goal of enhanced world’s food security, reduced poverty, and sustainable socio-economic development.

In this regard, a regional collaborative project “Implementation of the Global Plan of Action (GPA) for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture (PGRFA) in Asia and the Pacific Region” was initiated for fifteen Asian countries by the FAO. Myanmar signed a letter of agreement (LOA) with the FAO based in Bangkok on 23<sup>rd</sup> September 2009 to participate in this regional project for establishing the NISM-GPA in Myanmar.

The establishment of NISM-GPA provides a great opportunity for Myanmar, a developing country with rich biodiversity, to strengthen its national efforts towards conservation and sustainable use of the country’s rich PRGFA. The project was implemented in Myanmar with the aims of increasing the country’s capacity for networking in PGRFA through the integration, and strengthening of diverse national activities, increasing public awareness, and policy development.

## **Overview of the NISM-GPA Establishment Process**

The NISM-GPA establishment process in Myanmar involves three phases: preparatory, implementation, and reporting. After setting up a steering committee, project implementation was initiated by a series of activities upon designation of the national focal point (NFP). The implementation process included several activities: training for NISM-GPA software applications, and designation of role and functions of stakeholders and translation of key documents, such as indicators and reporting formats into Myanmar language. Data relevant to the 20 priority areas of the GPA were gathered from each stakeholder. After gathering the data, data validation, gap filling and constraints and opinions from stakeholders were obtained in a final meeting for synthesizing the country report and web development. Based on the findings from analyses of gathered data, this final report was prepared and a web portal developed to finalize the NISM-GPA establishment in Myanmar.

### **Preparatory Phase**

Steering committee (SC) for the project implementation was organized on 16<sup>th</sup> October 2009 with five higher officials from concerned organizations of the Ministry of Agriculture and Irrigation (MOAI). Seed Bank, Department of Agricultural Research (DAR) was designated as the National Focal Point (NFP) by the steering committee to coordinate and support the works for the establishment of NISM-GPA in Myanmar. The SC reviewed the current capacity of human resource and institutions concerned in PGRFA and gave the guidelines for formulating an action plan, the selection of stakeholders, group trainings, and information sharing policy.

### **Stakeholder Selection**

According to the guidelines by the SC and discussions with relevant organizations, stakeholders were selected based on the role and functions of their mother organizations and involvement in PGRFA activities. Selected stakeholders represent the Department of Agricultural Research (DAR) and Myanma Agricultural Services (MAS). A total of 19 stakeholders were selected for NISM-GPA establishment and divided into two groups: 8 members in Group A and 11 members in Group B for the ease of trainings and implementation.

### **Implementation Phase**

NISM-GPA implementation was based on by the action plan developed by NFP and project working group from the Seed Bank based on the guidelines by the SC. The project implementation phase involved several activities of trainings for NISM-GPA application, meetings, data gathering and compilation, validation and analysis, reporting and developing NISM-GPA website. Selected stakeholders from different divisions and regions of Myanmar were contacted and informed for attending the trainings.

### **Reporting phase**

Based on data gathered and information provided by stakeholders, the final report was prepared by the NFP and working group. Numerous suggestions, comments and experiences made by the stakeholders reflect the needs, opportunities and ways forward for establishment and maintaining

of NISM-GPA in Myanmar. The NISM-GPA website of Myanmar and database will be accessible by interest users and public people through the address, <http://www.pgrfa.org/gpa/nisms.htm>.

## **Summarized View on the NISM-GPA Establishment**

Followings are some of the views on NISM-GPA establishment and successful GPA implementation based on the exchanges, experiences, constraints, needs and opportunities throughout the implementation of NISM-GPA in Myanmar that will be guidelines for finalizing the NISM-GPA establishment, and future implementation of GPA and maintenance of the mechanism:

### **Wider stakeholder inclusion**

For the successful implementation of GPA, current stakeholder member is not enough for the whole mechanism of GPA implementation. More stakeholders from other institutions or ministries such as Ministry of Environmental Conservation and Forestry, Ministry of Education, Ministry of National Planning, Yezin Agricultural University, NGOs and farmers should be included. Stakeholder selection should be carefully selected in the future.

### **Training for PGR knowledge and ICT**

For getting active participation, it is recommended that PGR and information and communication technology (ICT) training are first needed, especially for agricultural extension specialists, seed and research farm staffs, other related ministries, and NGOs. Stakeholders suggested that information dissemination, communication infrastructure and transportation access in the country need to be well developed for the implementation of GPA and establishment of national information sharing mechanism (NISM).

### **Endangered species**

By the establishment of NISM-GPA, important information of PGRFA could be gathered for taking actions such as in relation to endangered species. At regional scale, some of underutilized species are near to extinction because of higher market demand and export. Wild rice populations are also under the threats of over grazing, urbanization, and climate change. A lesson learned from the NISM-GPA training and our own experiences, stakeholders indicated urgent need for an inventory of local crop landraces, underutilized crops, and indigenous knowledge and, also need for technical skills to be able to work on these issues.

### **On farm conservation**

Stakeholders indicated that some areas are still feasible for on farm conservation of local crop landraces such as rice, soybean, vegetables and medicinal plants. The data and information provided by stakeholders are very valuable for implementing on farm conservation projects in Myanmar. Moreover, systematic studies of indigenous knowledge on the use of crops and wild plants by different ethnic groups is needed.

## **Germplasm exchange and use**

If the seed exchange system among the different stakeholders or institutions and farmers could be established, those valuable germplasm can be safely conserved and used and existing *ex situ* collections of Seed Bank will be expanded. It is also indicated that the need for capacity building for production of good quality seeds is needed for the farmers. Capacity building for pre-breeding research in the fields of gene mapping, molecular breeding and genomics tools for genetic enhancement and genetic base broadening of elite varieties are needed to promote the use of conserved germplasm.

## **Cooperation**

By the NISM-GPA implementation, understanding and cooperation among the stakeholders from governmental organizations, NGOs, and Seed Bank are strengthened that will be a good starting point for future implementation of GPA in Myanmar.

## **Biodiversity education**

Biodiversity education should be formalized in basic, higher and university level education although very few universities have programmes on biodiversity for students. Farmer education needs to be established using simplified technical words and demonstrations in the fields and also through the mass media.

## **Organizational strength and capacity building**

Lack of sufficient staff number, financial support, technical skill and clear policy support indicated the need of strengthening organization structure and capacity building in Myanmar. Institutional in networking and building the technical know-how for *in situ* conservation is required as well as enhancing the use and market development of local crop landraces.

## **Steps towards institutionalization of NISM-GPA in Myanmar**

For the institutionalization of NISM-GPA, an action plan was developed. Based on the action plan, Myanmar will maintain and upgrade the NISM-GPA for the successful implementation of GPA in Myanmar.

- Establishment of a National PGRFA Committee (NPC)
- Synthesizing National Action Plan of PGRFA under NBSAP
- Training and capacity building for PGRFA and ICT for active participation
- Formation of coordination framework for all stakeholders from different institutions under National Action Plan
- Increasing public awareness and participatory conservation through the NISM-GPA network
- Regular update of data and information by stakeholders
- To make a country report on the state of PGRFA to FAO

## **Conclusion**

Before the implementation of this project, PGRFA information and facts are dispersed in separate organizations or stakeholders. By the establishment of NISM-GPA in Myanmar, the capacity for information gathering and sharing was enhanced and national PGRFA activities and efforts could be gathered and recorded. Moreover, coordination among the stakeholders was strengthened. Based on the information provided by the stakeholders, national priority setting action plans, and future directions could be formulated for the conservation and sustainable use of the country's PGRFA. The NISM-GPA in Myanmar will be sustained based on a synthesized action plan.

Moreover, stakeholders agreed on the needs for improvement in several aspects of GPA priority areas in the country. For overcoming the drawbacks, difficulties, and constraints in GPA implementation in Myanmar, establishment of national committee of PGRFA, wider inclusion of stakeholders, capacity building for PGR conservation and use, infrastructure development for ICT, formalization of biodiversity education and, strengthening stakeholder's cooperation are recommended.

## Nepal

### Final Summary Report on Project “Capacity Building and Enhanced Regional Collaboration for the Conservation and Sustainable Use of Plant Genetic Resources in Asia” GCP/RAS/240/JPN

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#### Background

Despite covering less than 0.1% of the world’s land area, Nepal is 31<sup>st</sup> in the world’s ranking in terms of richness in biodiversity. Thus, the country has a high possession of biodiversity at genetic, species and ecosystem levels (MOFSC, 2002). Owing to large range in altitudinal and physiographic variations, it Nepal has diverse ecologies. It is believed to have 10,107 species of flora and fauna including 599 food plants and 200 domesticated crops species across the country (Malla, 1999). Numerous wild-relatives or species of food plants are not well known. The major food crops grown are:

- **cereals** such as paddy, maize, wheat, millets and barley
- **pulses** such as lentil, pea, cowpea, soybean, chickpea, green gram, black gram and red gram
- **cash** crops such as sugarcane, jute, tobacco, tea, cotton, cardamom and ginger
- **oilseed** crops such as mustard, rapeseed, linseed and groundnut
- **fruits** such as citrus, apple, nuts, mango, banana, guava, peach, plum and persimmon
- **vegetables** such as potato, cucurbits, tomato, brinjal, chilies, radish, turnip, carrot, cauliflower, cabbage, knolkhol, broccoli, amaranths, beans and okra.

A large number of minor and underutilized crops species are grown nationwide on a small scale and subsistence level. Crops such as rice, beans, brinjal, buckwheat, soybean, foxtail millet, citrus and mango show high genetic diversity in the country including their wild relatives. Some forests species are also reported as being used for food (47 species), fodder (38 species), medicine (19 species) and cultural events (27 species). The food plants belong to 172 families, 296 genera, 599 species and 35 sub-species, among which 60 families, 155 genera, 225 species and 31 sub-species are cultivated. About 15 species are cereals crops, 18 species are grain legume crops, 23 species are fruit crops and there are over 100 species of vegetable crops. Many species are cultivated as spices, condiments and ornamental plants (Regmi, 1995). Some of the wild species have been used as genetic resources to add crop resistance to various stresses, improve product quality, alter modes of reproduction and crossability between species, induce short stature plant types and increase yield.

## Status of Plant Genetic Resources before establishment of NISM-GPA

### *In situ management of plant genetic resources*

During 1997-2005 Nepal joined in a global project called “Strengthening the Scientific Basis of *In Situ* Conservation of Agricultural Biodiversity”. This project focused on understanding of farmer’s decision-making processes for *in situ* conservation of domesticated crops along with habitats of their adaptation, strengthening national capabilities to carry out research activities in the area and enhancing the value of agrobiodiversity by direct involvement of farmers and other stakeholders (Upadyaya and Subedi, 2003). The project emphasized *in situ* conservation of PGRFA and carried out many activities that included

- baseline surveys, diversity fairs, Rapid Rural Appraisal and Participatory Rural Appraisal
- four cell analysis for rapid diversity assessment
- community biodiversity registration
- community seed banks
- community biodiversity management
- participatory plant breeding for value addition of PGRFA
- non-breeding approaches such as market promotion and food festivals
- linking biodiversity conservation to development activities.

### *Ex situ management of plant genetic resources*

Before establishment of the National Agriculture Genetic Resource Center (the national gene bank) in 2010, the responsibility for *ex situ* management of PGRFA was with national commodity research programmes in Nepal Agriculture Research Council (NARC). The programmes (for rice, maize, wheat, oil-seeds, pulses, hill-crops, citrus, potato, sugarcane etc.) carried out *ex situ* management of plant genetic resources by maintaining some landraces of relevant crops in field at agriculture research stations. It required growing the landraces every year. Besides that, a seed repository (with 20 m<sup>2</sup> of space at 5°C and 45% RH) in Nepal Agriculture Research Council (NARC) was also responsible for preserving 10,781 orthodox seed accessions of 90 crop species collected from different regions of the country through various national and international exploration missions. The repository suffered from limited financial resources and unreliable supply of electricity. Use of available plant genetic resources was poor in Nepal, mainly due to the limited number of plant breeders, financial support and facilities such as gene bank especially for horticultural crops. There was a lack of safety duplication of conserved genetic resources. In addition, inaccessible areas were not fully represented in the collections. A systematic plan to collect diversity has not yet been developed due mainly to the aforementioned limitations. Eco-geographical assessment of diversity, exploration and collection missions, systematic documentation and training of resource persons are major priorities to enhance plant genetic resources conservation and sustainable use in Nepal. Information on the country’s plant genetic resources was weak due to lacking of data base management.

### *Use of Plant Genetic Resources for Food and Agriculture*

About 216 improved varieties of 44 crops representing cereals, legumes, oil seeds, potato, vegetables, industrial crops and forage have been released in Nepal. Presently, 14% of local landraces in rice and 42% of that in maize are some way utilized in crop improvement programmes (Gautam, 2008). None of such utilization of local landraces is reported in wheat and other crops. It indicated that use of locally available genetic resources in crop improvement is very limited. Lack of germplasm characterization, evaluation and documentation, poor integration of conservation and utilization activities and insufficient plant breeding capacity (human resource, fund and physical facilities) have been major constraints to the use of conserved germplasm. A total of 6,812 accessions in the seed repository had been characterized by 2007 (Gautam, 2008; NARC, 2007) for some agro-morphological traits. Molecular techniques such as isozyme, Random Amplified Polymorphic DNA and microsatellite were also used to characterize the selected species of crops. Their characterization and evaluation for disease/insect resistance and drought, biotic and abiotic traits had not been undertaken.

**Table 1. Characterization and evaluation of Nepalese crops germplasms**

Sl. No.	Crops	No. of Accession								
		Before 2000	2001	2002	2003	2004	2005	2006	2007	Grand Total
1.	Barley	972	78	146	–	–	–	–	–	1 196
2.	Broad bean	35	127	–	–	–	–	–	–	162
3.	Buckwheat	507	–	93	–	–	–	–	–	600
4.	Chickpea	250	–	–	–	–	–	–	–	250
5.	Cowpea	72	–	–	–	–	–	–	–	72
6.	Finger millet	718	–	97	100	50	–	–	–	965
7.	Grain Amaranths	76	–	–	–	–	–	–	–	76
8.	Lathyrus	87	–	–	–	–	–	–	50	137
9.	Lentil	146	–	–	50	100	100	100	50	546
10.	Mungbean	53	–	–	–	–	–	–	–	53
11.	Pigeonpea	227	–	–	–	–	–	–	–	227
12.	Rice	1 331	140	148	200	50	100	100	100	2 119
13.	Soybean	230	–	81	–	–	–	–	–	311
14.	Taro	48	–	–	–	–	–	–	–	48
	Total	4 752	345	565	350	200	200	200	200	6 812

### *National Plans, Policies and Legislations*

Nepal is a signatory to the Convention on Biological Diversity and International Treaty on Plant Genetic Resources for Food and Agriculture. Nepal, therefore, has commitments to their implementation in the country through relevant plans, policies and legislative arrangements. Accordingly, the tenth plan (2002-2007) emphasized biodiversity conservation with provisions for programmes on maintaining habitats, reducing the decline of important species, *in situ* conservation and community participatory ecotourism, seed banks and variety development. Establishment of community based seed banks (Maharjan et al., 2011; Gautam, 2008) and institutionalization of crop selection system are some achievements.

The Government of Nepal's three-year interim plan (2007/08-2009/10) has adopted objectives and strategies set out in the Agro-biodiversity Policy 2007 regarding conservation, promotion and sustainable use of agro-biodiversity and related traditional knowledge through research, development and institutional arrangement for establishing community and public ownership on such resources. The plan and the policy have provisions for agro-biodiversity registration and documentation, and for development of regulatory mechanisms to define farmers and state ownership on and access to the benefits from these resources.

## **In Country Project Implementation**

### *NISM-GPA Initiation*

The Letter of Agreement between Ministry of Agriculture and Cooperatives (MoAC) and Food and Agriculture Organization (FAO), Regional Office for Asia and the Pacific, initiated the project "Capacity building and regional collaboration for enhancing the conservation and sustainable use of plant genetic resources in Asia" in Nepal. A nine-member steering committee (Annex 1) was formed under the chair of National Focal Point Dr. Hari Dahal, Joint Secretary to the Gender Equity and Environment Division (GEED) in the Ministry of Agriculture and Cooperatives. Ms. Bidya Pandey, Senior Horticulture Development Officer in GEED, was appointed to liaise between the National Focal Point and project implementation group by Agriculture Botany Division of Nepal Agriculture Research Council (NARC). The Ministry of Agriculture and Cooperatives decided to assign implementation of the project to Agriculture Botany Division of the Nepal Agriculture Research Council (NARC). With delegation of project implementation responsibility, Dr. M.P. Upadhyay, In-Charge of Plant Genetic Resources Unit in the Division, was appointed as member secretary in the steering committee. The Steering Committee hired Mr. Surendra Kumar Shrestha as a NISM-GPA database manager to assist the work and the maintenance of the database in Nepal.

### *NISM-GPA Implementation*

Implementation of the NISM-GPA started in August 2009 in Nepal with the preparation of a work plan for setting up the NISM-GPA followed by a training of support staffs from relevant stakeholders on common table input on February 15, 2010 (Annex 2). Nine personnel from GEED (MoAC), Agriculture Information and Communication Center (MoAC) and Agricultural Botany Division (NARC) participated. Besides orienting the participants towards establishment of the National Information Sharing Mechanism, the activities planned for implementation and the associated software(s), the workshop was fruitful in identifying potential stakeholders (see Annex 3) to share in the system and prepare the ground for carrying out the initial stakeholder's meeting (workshop) and other activities in establishing the system.

The initial stakeholders' meeting (workshop) was held 14-16 April 2010 at Dhulikhel to brief the potential stakeholders about the project activities and solicit their views and commitment for the establishment of a NISM-GPA in Nepal (Annex 3). The participating potential national Stakeholders were invited to join a national network for the establishment of NISM-GPA Nepal. The priority activity areas of the GPA, the indicators and the reporting format for monitoring the GPA implementation, required information, adding the information into the common tables of NISM software and updating information in the tables were discussed. The stakeholders were provided with CDs of the NISM software and the manual for the system's

installation and data entry. After a month of the meeting, the stakeholders were visited. Most of the stakeholders were not able to start database management works due to

- lack of sufficient manpower
- stakeholders not designated for database management
- NISM establishment receiving low priority due to stakeholders' other responsibilities
- poor documentation system of the stakeholders
- frequent deputation of trained manpower to other responsibilities
- no administrative and financial support
- available database not in electronic format

As a result, frequent visits were undertaken to help the stakeholders in uploading information from available database and entering it into the NISM system. The visits were associated with on-spot training for stakeholders.

A final workshop of the stakeholders was organized on 15 August 2011 at the National Agriculture Genetic Resources Center. Mr. Surendra K. Shrestha updated the progress and future plan for the NISM-Database system. All together 18 members from various organization participated in the workshop. (Annex 4). The workshop reviewed on the central database in the system that combined information available from all the stakeholders and finalized it. The database was later approved and decided to upload in web page for wider sharing by the steering committee meeting held on 19 August 2011 at the National Agriculture Genetic Resources Center. All together seven-committee members participated the meeting. (Annex 5).

#### *Discussion and Decision of the Final Steering Committee Meeting*

- linking complete database in website of MoAC and also agreed to link the database at the NARC website
- continuation of NISM-GPA in country (Table 2)
- NAGRC as coordinator for the NISM-GPA database system
- designating a PGR focal point in Department of Agriculture and the focal point will coordinate the NISM- GPA database of the Department

The meeting also decided to establish a Technical Committee for PGRFA, and NAGRC will initiate this activity. The terms and reference for the committee will be prepared.

### **Current Status of NISM – Database Management in Nepal**

Currently, combined data entry in most of the Common Tables such as organization table, project table, reference table, area table, contact persons table and cultivar table has been completed. Documentation of available information in the common tables regarding the four major areas of the GPA such as *in situ* conservation, *ex situ* conservation and use of plant genetic resources and institution and capacity building has been completed. The National Agriculture Genetic Resources Center in NARC, vegetable seed production centers in Department of Agriculture and Local Initiative for Biodiversity Research and Development (NGO) are included in the first NISM-GPA iteration. The first iteration of the database has

**Table 2. Proposed work plan and budget for continuation of NISM-GPA in country**

Activities	Budget (NRs.)
1. Update and inclusion of new stakeholders in NISM-GPA database	
One site level stakeholders training and next phase database update	408 000
Follow up for quarterly updated the database	25 000
Training to new stakeholders	51 000
Validate/update/merge database (NFP)	75 000
2. Establishment of PGRFA Technical Committee	
Workshop to establish PGRFA technical committee	50 000
Total	609 000

covered an entry of more than 10,000 germplasm accessions stored in the gene bank from more than 4,000 areas including Village Development Committees, Municipalities national/district level programme/projects/organizations. The national Nepal NISM-GPA-website is in the process of being established.

National Agriculture Genetic Resources Center (NAGRC) established under NARC in 2010 to work as the national gene bank to enhance exploration, conservation, characterization, rejuvenation and documentation of PGR in Nepal. More than 10,700 accessions in the previously working seed repository have been entered in the NISM-GPA system. Besides repackaging and regenerating previously collected germplasms, the center has been continuing the exploration, survey, collection and documentation of PGRFA as its regular activities. The center is responsible for operation and sustainability of NISM-GPA and linking it to other potential stakeholders. Capacity building in NAGRC as well as relevant stakeholders would contribute to the system's operation and sustainability.

It is essential to better understand the roles and values of the diversity of plant genetic resources in terms of economic, social, cultural and ecological value. Understanding the ecological services and the value of diversity will promote the conservation and sustainable use of plant genetic resources. NAGRC needs capacity building to enhance assessments of the state of diversity of plant genetic resources including ways to better assess genetic erosion.

Nepal has succeeded in networking in-country PGRFA related organizations for sharing of the plant genetic resources related information with establishment of the NISM-GPA system. The system has contributed to integrating fragmented PGR related databases in the country.

### **Future Needs and Institutionalization of NISM-Database**

Institutionalization of NISM-database is our future perspective. Only three stakeholders shared their data with the National Focal Point. Sustainable operation of the system needs the continued support of a database specialist. The specialist should also continue to support other stakeholders through field visits and trainings linking them to the system. The National Focal Point as well as NAGRC bears responsibility for regular update of the information in the system and sustenance of the mechanism through a regular budget. In addition, regular national PGR consultations are needed in the future.

Strengthening the capacity of NAGRC is necessary, also human resources to regularly update of the database and other logistics.

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## Annexes

### Annex I. List of Project Steering Committee, October 28, 2009

Sl. No.	Designation	Address	Status
1.	Joint Secretary/Nat. Focal Point	GEED, MoAC	Chairman
2.	Director	Planning and Coordination, NARC	Member
3.	Director	Crops and Horticulture, NARC	Member
4.	Deputy Director General	Planning, DoA	Member
5.	Deputy Director General	Planning, DoLS	Member
6.	Chief	Seed Quality Control Center, MoAC	Member
7.	Representative	GEED, MoAC	Member
8.	Chief	Agriculture Botany Division	Member
9.	In charge, Senior Scientist	Plant Genetic Resources Unit, Agriculture Botany Division, NARC	Member

### Annex II. Training of support staffs from relevant stakeholders, February 15, 2010

Sl. No.	Name	Designation	Address
1.	Dr. M.P. Upadhyay	SS	ABD, Khumaltar
2.	Dr. Ashok Mudwari	Chief	ABD, Khumaltar
3.	Dr. Deepak Mani Pokhrel	S. Hort. Dev. Officer	GEED, MoAC
4.	Ms. Bidya Pandey	S. Hort. Dev. Officer	GEED, MoAC
5.	Ms. Jyotsna Shrestha	Food Res. Officer	GEED, MoAC
6.	Ms. Namrata Singh	Livestock Dev. Officer	GEED, MoAC
7.	Mr. Salik Ram Gupta	STO	ABD, Khumaltar
8.	Dr. Hari Bahadur K.C	STO	ABD, Khumaltar
9.	Mr. Nilkantha Pokhrel	Agri. Ext. Officer	Agriculture Inf. and Com. Center Res.Div., NARC
10.	Mr. Surendra K. Shrestha	Data Specialist	NISM-GPA, Nepal

### Annex III. Participants of the Initial Stakeholders' Meeting, April 14-16, 2010

Sl. No.	Name	Designation	Address
1.	Dr. M.P. Upadhyay	SS	ABD, Khumaltar
2.	Mr. Ashok Mudwari	Chief	ABD, Khumaltar
3.	Dr. Deepak Mani Pokhrel	S. Hort. Dev. Off.	GEED, MoAC
4.	Ms. Bidya Pandey	S. Hort. Dev. Off.	GEED, MoAC
5.	Ms. Jyotsna Shrestha	Food Res. Off	GEED, MoAC
6.	Ms. Namrata Singh	Livestock Dev. Off.	GEED, MoAC
7.	Mr. Salik Ram Gupta	STO	ABD, Khumaltar
8.	Dr. Hari Bahadur K.C	STO	ABD, Khumaltar
9.	Ms. Deepa Singh	S-1	Hort. Res.Div., NARC
10.	Mr. Sankar Pandey	Livestock Dev. Off.	National Pasture & Animal Feed Centre
11.	Mr. Deepak Pandey	Seed Dev. Officer	Seed & Quality Control Centre
12.	Mr. Deepak Sapkota	Crop Dev. Officer	CDD,DOA
13.	Dr. Madhav P. Pandey	Lecturer, Dept. of Pl.Br.	IAAS, Rampur

**Annex III. (continued)**

Sl. No.	Name	Designation	Address
14.	Mr. Hemant K. Chaudhary	T-7	NWRP, Bhairahawa
15.	Mr. Sanjay Lama	Accountant	ABDAN
16.	Dr. Bharat K. Poudyal	Senior Veg. Dev. Officer	Cen.Veg. seed Prod. Centre, Khumaltar
17.	Mr. Saches Silwal	Project Officer	LIBIRD
18.	Mr. Bhanu Bhakta Pokhrel	T-6	NMRD, Rampur
19.	Mr. Surendra K. Shrestha	Data Specialist	NISM-GPA, Nepal
20.	Miss Sajita Silwal		ABD
21.	Dr. Duncan Vaughan	FAO-CTA	

**Annex IV. Participants of the final stakeholders' meeting, August 15, 2011**

Sl. No.	Name	Designation	Office/organization
1.	Dr. Hari Dahal	J. Sec./focal point, NISM-GPA	MOAC
2.	Mr. Devendra Prasad Yadav	Chief	Nat. Pas. and Animal Feed Centre
3.	Mr. Dila Ram Bhandari	Chief	Seed Quality Control Centre
4.	Dr. Hari Bahadur K.C.	Senior Technical Officer	NAGRC
5.	Ms. Shova Paudel	Agri. Extension Officer	Directorate of Crop Development
6.	Ms. Neelam Subba	Scientist	Hor. Res. Div., NARC
7.	Dr. Bharat Kumar Poudyal	Senior Veg. Dev. Officer	Cen. Veg. Seed Prod. Center
8.	Ms. Bidya Pandey	Senior Hort. Dev. Officer	GEED, MOAC
9.	Dr. Madan Raj Bhatta	Chief	NAGRC
10.	Dr. Deepak M. Pokhrel	Senior Hort. Dev. Officer	GEED, MOAC
11.	Mr. Mukunda Bhattra	Technican	NAGRC
12.	Mr. Tek Bahadur Chhetri	Technical Officer	NAGRC
13.	Mr. Arjun Singh Thapa	Programme Officer	FAO-Nepal
14.	Mr. Dayanand Mandal	Senior Scientist Sn	NAGRC
15.	Mr. Uma Shankar Shah	Senior Scientist	NAGRC
16.	Mr. Salik Ram Gupta	Senior Scientist	NAGRC
17.	Mr. Surendra K. Shrestha	Data Specialist	NAGRC
18.	Mr. Bishnu Rana Magar	Admin. Officer	NAGRC

**Annex V. The steering committee meeting, August 19, 2011**

Sl. No.	Name	Designation
1.	Dr. Hari Dahal	Joint Secretary., MoAC (National Focal Point and the chairperson)
2.	Dr. Vaidya Nath Mahato	Director, Planning and Coordination, NARC
3.	Mr. Nawal Kishor Yadav	Director, Finance, NARC
4.	Mr. Lila Ram Paudel	DDG, Planning, DoA
5.	Mr. Nara Bahadur Rajwar	DDG, Planning, DLS
6.	Mr. Lal Prasad Acharya	Senior Officer, Seed Quality Control Center
7.	Dr. Madan Raj Bhatta	Member Secretary, Chief, NACRC

## Pakistan

### Final Summary Report on Project “Capacity Building and Enhanced Regional Collaboration for the Conservation and Sustainable Use of Plant Genetic Resources in Asia” GCP/RAS/240/JPN

Md. Shahid Masood  
CSO/Senior Director (IABGR)  
National Agricultural Research Center  
Park Road, Islamabad, 45500

GCP/RAS/240/JPN: Capacity Building and Regional Collaboration for Enhancing the Conservation and Sustainable Use of Plant Genetic Resources in Asia

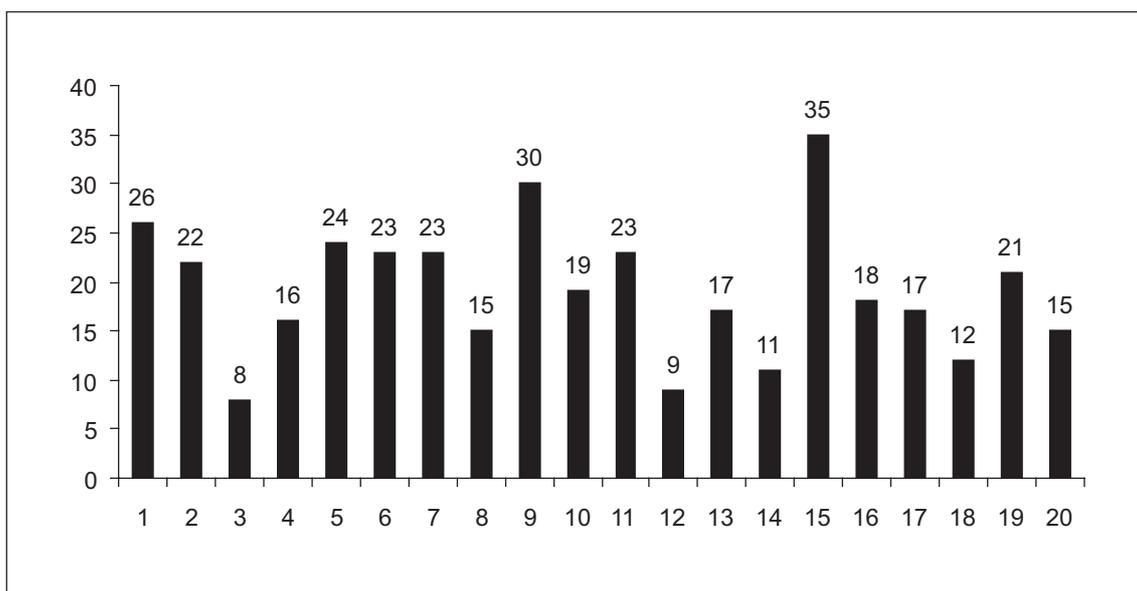
- A physical plan of work was prepared and finalized in consultation with the Chief Technical Advisor of the project indicating the activities to be performed in Pakistan with time frame and output.
- A letter of agreement (LOA) for in-country project activities was completed. It was signed by the Chairman, PARC on behalf of the Pakistan Agricultural Research Council and Mr. Gamal Mohamed Ahmed FAO Country Representative in Pakistan on behalf of FAO.
- One day workshop entitled “Strengthening Plant Genetic Resources Information system for Food and Agriculture including the National Information Sharing Mechanism (NISM) for the Global Plan of Action” was organized on December 16, 2009 at IABGR. It was attended by 32 key stakeholders from Federal and Provincial Institutes. The workshop was inaugurated by Chairman, PARC. Total 8 presentations were made at this occasion.



*Group Photo of the Participants*

- Two days training course for all the stakeholders of National Information Sharing Mechanism software was organized on April 13-14, 2010 at NARC, Islamabad. It was attended by 21 stakeholders from Federal and Provincial Institutes.

- Hands on training was given to all the stakeholders regarding NISM-GPA software and its implications to the national PGR documentation database. Participants were provided sufficient information materials on training. Web-based information was also demonstrated, which is an important source for sustainable utilization of plant genetic resource for food and agriculture.
- The common tables were used one by one, to add information, insert, delete and edit records and remove errors. The practical session was also held to get familiarized with the NISM software i.e. common tables and priority areas. Discussions were held to elaborate the gap and deficiencies.
- A survey was conducted on the 20 priority areas of Global Plan of Action for further improvement of the document. Altogether 51 stakeholders responded.



**20 Priority Activity Areas of GPA**

- One day national seminar on “Biodiversity Conservation” was organized by IABGR on December 21, 2010 at NARC. The Honorable Chairman, PARC graced the occasion as Chief Guest. In his inaugural address, he emphasized the importance of biodiversity conservation to ensure food security in the country. More than fifty delegates from federal and provincial research organizations, educational institutions, NGOs and private sector participated in this seminar. Ten key papers on “Biodiversity Conservation” and related topics were presented by the eminent scholars.
- The proceedings of the seminar on “Biodiversity Conservation” was published to disseminate the information to the stake holders.
- Institute of Agri-Biotechnology & Genetic Resources (IABGR), NARC organized one day national seminar “**Biodiversity Conservation**” on December 21, 2010 at NARC Auditorium, Islamabad. A concurrent event organized by the IABGR was a **competition of essay writing among the students of schools, colleges and universities** in order to sensitize youth to the importance of biodiversity.



*Group Photo of Participants of Seminar*

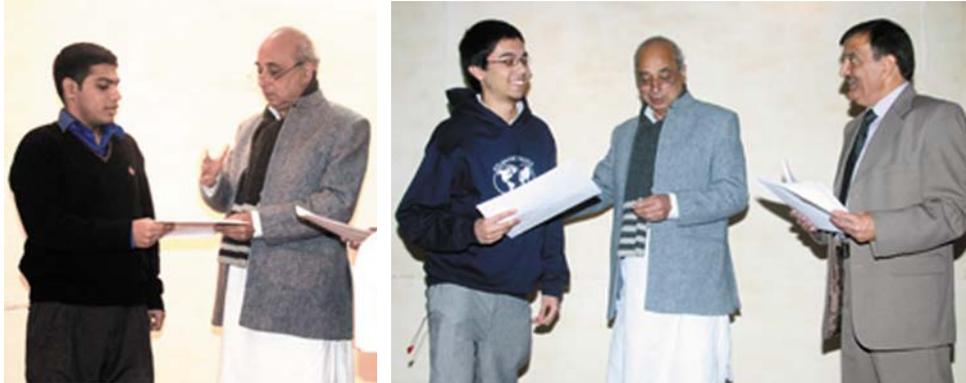


*Chairman, PARC, Director General NARC & Sr. Director IABGR (right to left, respectively) in the Inaugural Session*

- A total of 37 students from the universities, colleges and schools participated in the essay writing competition that indicated the enthusiasm among the youth.
- The name of 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> winners among universities are “Muneeba Fauze, B.Sc (Hons) of Plant Breeding & Genetics, Ammarah Anam BS (Hons) of Environmental Sciences, Ameena Saeed (M.Phil) of Environmental Sciences. Similarly, the name of 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> of winners among School students are Ammad Bilal, Tehreem Mohsin and Muhammad Salman Tajamal of O and A level. The Chairman, PARC distributed the prize and certificate among the winners.
- The proceedings of the essay writing competition on “Biodiversity Conservation” were published.
- Seven catalogues were published to disseminate the information among the stakeholders for better utilization of PGR information for the crop improvement. Three more are in progress.



*College/University Students*



*School Students*

- Added information/data of twenty five (25) stakeholders in common tables and priority areas. This clearly indicates progress made after the earlier project GCP/RAS/186/JPN.

## Wheat (*Triticum aestivum* L.) Germplasm Catalogue

Sadar-Uddin Siddiqui  
Abdul Qayyum  
M. Shahid Masood  
Shakeel Ahmad Jatoi



Plant Genetic Resources Program  
Institute of Agri. Biotechnology and Genetic Resources  
National Agricultural Research Centre  
Islamabad, Pakistan  
2010

## Rice and Maize Germplasm Catalogue

Sadar Uddin Siddiqui  
Abdul Ghafoor  
M. Ashiq Rabbani  
M. Shahid Masood  
Abdul Qayyum



Plant Genetic Resources Program  
Institute of Agri. Biotechnology & Genetic Resources  
National Agricultural Research Centre  
Islamabad, Pakistan  
2011

## Conventional Oilseeds Germplasm Catalogue

M. Ashiq Rabbani  
Sadar Uddin Siddiqui  
Abdul Qayyum  
M. Shahid Masood



Plant Genetic Resources Program  
Institute of Agri-Biotechnology & Genetic Resources  
National Agricultural Research Centre  
Islamabad, Pakistan  
2011

## Non-Conventional Oilseeds Germplasm Catalogue

M. Ashiq Rabbani  
Sadar Uddin Siddiqui  
Abdul Qayyum  
M. Shahid Masood



Plant Genetic Resources Program  
Institute of Agri-Biotechnology & Genetic Resources  
National Agricultural Research Centre  
Islamabad, Pakistan  
2011

## Germplasm Catalogue of Kharif Minor Cereals (Sorghum, Millets)

Sadar Uddin Siddiqui  
Zahid Mahmood  
M. Shahid Masood  
Abdul Qayyum



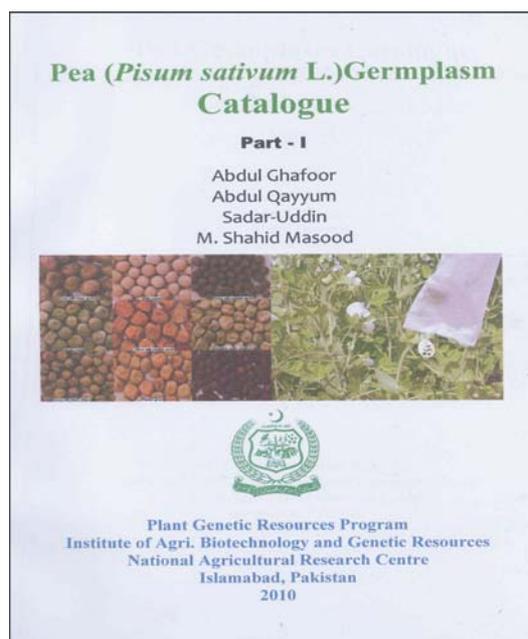
Plant Genetic Resources Program  
Institute of Agri. Biotechnology and Genetic Resources  
National Agricultural Research Centre  
Islamabad, Pakistan  
2011

## Germplasm Catalogue of Rabi Minor Cereals (Barley, Oat, Rye)

Sadar Uddin Siddiqui  
M. Shahid Masood  
Abdul Qayyum  
Asif Javaid



Plant Genetic Resources Program  
Institute of Agri. Biotechnology and Genetic Resources  
National Agricultural Research Centre  
Islamabad, Pakistan  
2011



### Status of Common Tables

Common tables	No. of Entries	
	2007	2011
Organizations	142	193
Contact Persons	524	801
Projects	98	169
Cultivars	491	539
Areas	09	105
Infosys	-	04
References	283	789
Agreement	01	01

- Tomato, rice and oilseed catalogue with evaluation data is in process.
- Vegetable catalogue with passport data is at the final stage.
- NISM data base ready for merging with the existing FAO database.
- This database will also be linked with PARC website.
- Meeting of the key stakeholders is scheduled at the end of November 2011 (probably 29<sup>th</sup>). This will help in sustaining the information system on PGR in the country. It will be a coordinated type of activities all across the country.
- The vast amount of useful information on PGR activities throughout the country in Pakistan had been gathered and documented in the NISM-GPA database. Stakeholders from around the country were contacted by IABGR to discuss and share knowledge about the Global Plan of Action.
- The establishment of the NISM-GPA also enhanced coordination and collaboration of activities and reduced duplication of efforts among the various institutions in the country.

## Philippines

### Final Summary Report on Project “Capacity Building and Enhanced Regional Collaboration for the Conservation and Sustainable Use of Plant Genetic Resources in Asia” GCP/RAS/240/JPN

Clarito Barron  
Director, Bureau of Plant Industry,  
692 San Andreas St. Malate,  
Manila, Philippines

The Letter of Agreement for the project between FAO Representative to the Philippines and the Philippines through the Secretary of the Department of Agriculture was signed in October 8, 2009. Immediately after that, an office Memorandum Order was signed by Mr. Joel S. Rudinas, then Director of Plant Industry that created the BPI Steering Committee for the project to assist the Director (as Focal Person) in the execution of the activities of the project’s Work and Financial Plan and see to it that all the outputs are realized.

A National Steering Committee Meeting was conducted in October 9, 2009 the highlight of which was the review of the constitution of the National Steering Committee, list of stakeholders and implementation of the Work and Financial Plan. It was decided that stakeholders from different Department of Agriculture (DA)-Regional Field Units (RFUs) and attached agencies, other government agencies aside from DA, Private Institutions and other State Universities and Colleges (SUCs) would be invited to expand the number of participants (the first phase of the project (GCP/RAS/186/JPN) included only members of the Philippine National Network of Plant Genetic Resources for Food and Agriculture (PNNPGRFA)).

There were two (2) trainings that were held in 2009 and two (2) in 2010 on the establishment of NISM-GPA. These trainings were attended by 28 institutions from the government system and 18 stakeholders from the SUCs (Table below). A total of 63 participants were trained in the use of NISM-GPA software.

Type of Institution	Number	Number of Participants
<b>Department of Agriculture</b>		
BPI National Crop Research and Development Center	5	11
BPI Central Office	1	4
Regional Field Offices	15	15
Commodity Institutions	6	11
<b>Academe</b>		
State Universities and Colleges	18	21
<b>Other Government Institution</b>		
DENR-Ecosystems Research & Development Bureau	1	1
TOTAL	46	63

The project was explained to the heads of six (6) DA Commodity Institutions namely Philippine Coconut Authority (PCA), Sugar Regulatory Administration (SRA), Cotton Development Authority (CODA), National Tobacco Administration (NTA), Fiber Industry Development Authority (FIDA) and Philippine Rice Research Institute (PhilRice), as well as the 15 DA-RFU Executive Directors. Through the invitation letters forwarded to SUC Presidents and Director of the Department of Environment and Natural Resources, the implementation and importance of the project was disseminated.

The training was purely hands-on for the use of NISM-GPA Application Software. It was a refresher course for those who had already undergone training in the first phase of the project and new endeavor for the new participants. During this training, the strengths and weaknesses of each Center regarding their PGR capabilities were discussed and a schedule of implementation for the group was created. Through this exercise, stakeholders' problems to implement the establishment of NISM-GPA were determined. Most of the stakeholders have computers that can be used for the project, however, BPI-Baguio NCRDC, Los Banos NCRDC and Guimaras NMRDC needed urgent upgrading and replacements of hard discs and memory. The project also gave a small amount of financial help for the renovation of the Research Building of BPI-Guimaras NCRDC where PGR activities are conducted since it was severely damaged by termites.

In-between these trainings, the Steering Committee met to plan and implement two technical trainings on Characterization and Regeneration of Plant Genetic Resources to be conducted to enhance the capability of the stakeholders to conduct plant genetic resources activities. These were held at the BPI-Los Baños National Crop Research and Development Center on October 18-22 and October 27-30, 2010 in coordination with the National Plant Genetic Resources Laboratory who acted as resource persons. A total of 14 participants from the different DA-Regional Field Units and BPI offices who have not yet undergone training in PGR activities were chosen to attend the training on characterization of germplasm and 12 participants from the academe attended the training on regeneration of PGRFA.

Meanwhile, the plan to promote the *in situ* conservation by production of information, education and communication (IEC) materials and compilation of a book on "*In situ* conservation of PGRFA in the Philippines" was deferred because in the Philippines there is still no information materials on *in situ* conservation of plant genetic resources for food and agriculture that has been published except for rice. The Steering Committee is planning to do this for at least 8 wild crops which includes "lubi-lubi" (*Ficus psuedopalma*), "adlai" (*Coix lacryma*), "false olive" (*Champeria manillana*), "raspberry" (*Rubus spp.*), "wild rambutan" (*Nephelium maitum*), "artem" or wild banana (*Musa balbisiana*), "dawa" or foxtail millet (*Setaria italica*) and "buga" (*Dioscorea alata var*).

### **Data Merging and Analysis of Data**

A total of 40 stakeholders from the Department of Agriculture (DA) and the Academe were registered in the second phase of the establishment of NISM-GPA in the Philippines. Under DA, list of stakeholders include 20 from the Research Centers (RIARCS) of the different DA-Regional Field Units of the country, two (2) commodity institutions, five (5) National Research and Development Centers and Central Experiment Station of the Bureau of Plant

Type of Institution	Number
<b>Department of Agriculture</b>	
BPI National Crop Research and Development Center	5
BPI Central Office	1
Regional Field Offices and Research Centers	20
Commodity Institutions	2
<b>Academe</b>	
State Universities and Colleges	12
TOTAL	40

Industry. In addition, 12 stakeholders from the State Universities and Colleges (SUCs) joined the group.

As Director Rudinas was designated as the Department's Undersecretary for Field Operations, the NFP did not find it necessary for a Memorandum of Agreement to be forged between the Regional Executive Directors of DA-RFUs and BPI since all communications intended for the project is being signed by the Undersecretary. BPI was able to forge a MOA with the Central Mindanao University for the implementation of the project.

### **Problems Encountered**

Merging of the final zip file into the system was delayed due to the delayed submission of the 1) common tables which posed the problem of delayed creation of the stakeholders' copy of the system and 2) zip file, which delayed the merging, validation, managing and analysis of the data. These problems arose because of the availability of first-hand data, calamities that befell the country and the heavy workloads of the stakeholders.

### **Sustaining the Implementation of the NISM in the Country**

The country's commitment through BPI, to continue the maintenance and dissemination of the NISM, support training of representatives of stakeholders, and seek funding mechanisms to support the implementation of the NISM in the first phase of the project was not met because in the prioritization of activities and limited fund, NISM was not placed under high priority coupled with change of leadership (4 changes) in a span of two years which means changes in priorities and direction.

To address the issue of sustaining the project, BPI with the rationalization plan of the government has created a PGR Section in its Crop Research and make NISM an integral part of its system. In this connection, focus on the implementation of NISM will be assured. A move for the revival and expansion of the National Committee on Plant Genetic Resources (NCPGR) that shall set directions and formulate policies on PGR activities for priority plant species in the Philippines has been made and BPI will be member of the National Steering Committee where one of its term of reference is to enhance the development of a national PGR information system.

With the remaining project money, BPI is still going to pursue the launching of the project and MOA signing involving all stakeholders, Regional Directors of DA-RFUs, heads of DA commodity institutions, presidents of SUCs and other private institutions.

## **Sri Lanka**

### **Final Summary Report on Project “Capacity Building and Enhanced Regional Collaboration for the Conservation and Sustainable Use of Plant Genetic Resources in Asia” GCP/RAS/240/JPN**

P.P.G.W. Ratnasiri  
Deputy Director  
Plant Genetic Resources Centre  
Sri Lanka

The Fourth International Technical Conference of the Food and Agricultural Organization (FAO) of the United Nations in Leipzig, Germany in 1996 adopted twenty priority areas in the Global Plan of Action (GPA) for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture (PGRFA). The Conference also adopted Leipzig Declaration, which focuses attention on the importance of plant genetic resources for the world food security.

The Plant Genetic Resources Centre (PGRC), Sri Lanka, is the implementing agency of project on the establishment of National Information Sharing Mechanism (NISM) for monitoring implementation of Global Plan of Action (GPA) under the FAO/Sri Lanka project capacity building and enhanced regional collaboration for the conservation and sustainable use of plant genetic resources in Asia (GCP/RAS/240/JPN). A letter of agreement (LOA) was signed by the Director General of Agriculture and the FAO representative in Sri Lanka. PGRC is co-ordinating the implementation of the project activities in Sri Lanka. This agreement aims to support Sri Lanka in strengthening its activities related to information on PGRFA, particularly in relation to institutionalizing the regular updating of NISM-GPA the main monitoring mechanism of the Global Plan of Action.

The following activities were undertaken during the project,

1) Preparation and Contacting Previous and New Stakeholders (SH) list.

The project team consulted various organizations and private companies which are involved in conservation and sustainable use of PGRFA in Sri Lanka. Finally we were able to develop a list of 47 organizations which may be involved in activities related to conservation and sustainable use of PGRFA in Sri Lanka. The new stakeholders include officers of the provincial Department of Agriculture in the Northern and Eastern region of Sri Lanka. Other stakeholders include the private sector organizations, NGOs and universities.

2) Establishment of Steering Committee

The NFP formed a 19 member steering committee to govern the project NISM-GPA. The purpose of the project steering committee was to finalize the project on updating NISM for monitoring the implementation of GPA. After the establishment of the steering committee a series of meetings were organized to supervise the activities of the project.

### 3) Training Workshops for Stakeholders

#### a) First National training workshop for stakeholders

A two day training programme for the support staff on NISM-GPA was organized on 14<sup>th</sup> and 15<sup>th</sup> of June 2010, at the Paradise Beach Hotel in Nigambo. The first session of the workshop included three comprehensive presentations on establishment and implementation of NISM-GPA mechanism and the processes involved in the gathering and analysis of data. There were four other presentations by the Heads of the Departments on various aspects of genetic diversity crop species and PGRFA conservation systems in their organizations.

#### b) The Second National workshop

The second training which involved 49 participants consisted of various organizations was conducted on the 27<sup>th</sup> of August 2010, at the auditorium of the PGRC. The participants were first oriented on the importance of their participation in the establishment of NISM-GPA in the country to get their support and commitment to the project and also were introduced to the software application. It was a refresher course for those who had already undergone the training in the first phase of the project. The participants were trained on entering data in common table and activities, priority areas of the NISM-GPA database system.

#### c) The Third National workshop

The third National workshop on NISM-GPA was held on 7<sup>th</sup> and 8<sup>th</sup> of July 2011 at the Hotel Topaz in Kandy. Fifty five participants from National Agricultural Research Stations, NGOs, Private sector and other organizations attended the workshop.

Dr. Duncan Vaughan, Chief Technical Advisor, FAO Regional Office, Bangkok also attended the workshop and stressed the importance of sharing information and NISM-GPA database which has been made available in 22 languages. Furthermore he mentioned the mechanism of NISM-GPA including the background and the potential benefits arising from its implementation.

### 4) Visit to stakeholders for assisting and gathering information's

During June to August 2010 the project team visited stakeholders from the second National workshop of NISM-GPA. We identified their priority activity areas GPA and assisted some of the stakeholders with entry of data.

#### a) Provision of equipment.

Few computers, printers, colour scanners and photo copiers purchased to enable NFP and stakeholders to accomplish project activities.

#### b) Germplasm catalogues

Three germplasm catalogues were published to determinate the information among the stakeholders for better use of PGR for the crop improvement. Catalogues of tomato, brinjal and luffa germplasm have been published.

c) The International Year of Biodiversity

Two workshops on strengthening conservation of plant genetic resources for food and agriculture towards the International Year of Biodiversity was organized by the Plant Genetic Resources Centre on 10<sup>th</sup> December 2011 with over 100 participants at Dambana village. The second workshop organized in Northern Province to continue the celebration and to discuss the importance of conservation of biodiversity.

There is a need to take on a holistic approach to institutionalize NISM and its long term sustainability. If the project is considered useful and important that this alone should ensure that it will be sustained. Once a good data base is established it is not so difficult to maintain. It might be helpful to develop links with those who are involved with the CGRFA in other ministries. The quality of the data will affect its usefulness and hence sustainability.

Sri Lanka needs better coordination at the national level with various agencies and stakeholders involved in PGRFA conservation and sustainable use. The mechanisms and strategies to bring this about can be shared by well established countries.

The country also requires additional support in terms of human resources and infrastructure needed for PGRFA conservation and sustainable use and also a more focused collection of PGRFA, especially in crop wild relatives.

There is also a need for a more effective germplasm exchange programme and functional linkages between the existing PGR Networks.

## **Thailand**

### **Final Summary Report on Project “Capacity Building and Enhanced Regional Collaboration for the Conservation and Sustainable Use of Plant Genetic Resources in Asia” GCP/RAS/240/JPN**

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#### **Background**

Thailand was involved in the earlier Project (GCP/RAS/186/JPN) and completed the first iteration of NISM-Thailand in 2007. The present project started in 2009 allowed for updating and improvement to NISM-Thailand. A new National Focal Point was designated (Ms. Chutima Ratanasatien) and learning from the experiences of the 1<sup>st</sup> iteration new approaches were taken to improve NISM-Thailand.

#### **Implementation phase**

A national working group (NWG) consisting of 13 people was designated that developed a workplan and financial plan for the project. The NWG formulated questionnaires and guidelines for stakeholders in Thai to facilitate data gathering. Rather than hold large meetings of stakeholders visits were made to stakeholders on a one to one basis to enhance awareness and understanding and provide instructions individually as to how to prepare data for NISM.

To assist stakeholder essential supplies were ordered. Stakeholders were surveyed and data gathered from stakeholders. Data received from stakeholders was verified and inputted into the NFP-NISM database. Completed data was put on discs and distributed to stakeholders with an explanation as to how to use. The process was completed by holding a final stakeholders meeting on 5<sup>th</sup> September 2011.

#### **Database status**

The second iteration updates the 2007 1<sup>st</sup> iteration. Some activities recorded in the first iteration have not changed since 2007. It is considered that the NISM-Thailand database will be valuable baseline data for the Commission under the Plant Variety Protection Act. Funds may be available to support the updating of NISM-Thailand in the future. The data in NISM-Thailand will also be helpful for the Thai NFP to the CBD even though the information may not be in exactly the format required.

## Highlights from the 2<sup>nd</sup> iteration

Common tables	1 <sup>st</sup> iteration	2 <sup>nd</sup> iteration	Remarks
Organizations	395	497	102 increased
Contact persons	538	650	112 increased
Projects	138	225	87 increased
Taxons	75 787	75 857	70 increased
Cultivars	954	30 660	29 706 increased
Areas	102	66	36 decreased
Systems	5	7	2 increased
References	1 124	1 133	9 increased
Agreements	1	1	–

The quality and quantity of data in NISM Thailand has improved. The 1<sup>st</sup> iteration included 42 participants from 19 stakeholder organizations while the 2<sup>nd</sup> iteration included 48 participants from 30 stakeholder organizations, 26 of which were new.

*Priority area 1:* 43% of stakeholder responded to questions. Among significant projects was the diversity of upland rice Royal Project, local community biodiversity projects and the development of plant genetic resources for local communities.

*Priority area 2:* 40% of stakeholders responded and 371 farmers were found to be involved in on-farm management of PGRFA. This shows a considerable increase in information over the 1<sup>st</sup> iteration.

*Priority area 3:* Several genebanks can facilitate reintroduction of germplasm. The Department of Rice has re-introduced rice varieties to flooded areas for northern, eastern and central Thailand.

*Priority area 4:* Seven areas of replanting in *in situ* conservation were reported.

*Priority area 5:* There has not been a significant change in *ex situ* collections. However with the establishment of the Department of Rice in 2008, rice germplasm is now also conserved by this department (a total of 24,552 accessions) as well as the Department of Agriculture. The Royal Forestry Department has reported on its conservation of forest genetic resources.

*Priority area 6:* About 55% of collections are in need of regeneration. Appropriate regeneration is considered an important issue and 3 stakeholders reported their practices to ensure proper regeneration.

*Priority area 7:* The Department of Agriculture and Department of Rice annually adds some accessions to their collections.

*Priority area 8:* No information was provided by stakeholder regarding publication on innovative management strategies and/or improved methodologies for *ex situ* conservation of PGR, including vegetatively propagated and recalcitrant seeded plants, as well as for species neglected in current conservation activities.

*Priority area 9:* Evaluation of PGR collections including characterization are carried out regularly on rice, soybean, cotton, maize, mungbean and blackgram. Characterization, evaluation and number of core collections were expanded especially for rice. At present about 70% of collections have some descriptive data.

*Priority area 10:* SHs gave examples of genetic enhancement of rice and sesame. A number of researchers recognize the importance of crop improvement for food security, particularly in specific agroecological zones/farming systems.

*Priority area 11:* There are 28 more crops that are being promoted by the government for increasing crop diversity since the last iteration – so now there are 63 crops for which breeders can get plant breeders rights if they breed new varieties.

*Priority area 12:* 60% of the SHs actively supported the conservation and use of under-utilized crops to contribute to food security and rural development (only 16% in the 1<sup>st</sup> iteration). The areas that need to be addressed include:- improving processing, market development and public awareness. The number of crops and species for consideration increased from the 1<sup>st</sup> iteration.

*Priority area 13:* Five additional programmes were reported in this iteration, which support seed production and distribution such as the local tree seedling multiplication project.

*Priority area 14:* Three SHs reported activities to establish and expand market of rice, especially local varieties. Registrations of geographical indicators for crops/varieties have been undertaken. Product development has included analysis of nutrition value of rice. Activities include promotion of new markets; organic farming; strengthening cooperation among producers; initiatives in schools; street fairs.

*Priority areas 15-18:* The information has not changed significantly for these priority areas since the 1<sup>st</sup> iteration.

*Priority area 19:* Four training courses have been undertaken:-

Characterization and evaluation of rice germplasm; Promotion of planting and sustainable use of bamboo; Planting and use of forest trees for establishing networks for planting economic crops; Forest restoration in tsunami affected areas.

*Priority area 20:* The activity has been carried out separately throughout the country by each SH as part of projects using display panels, posters and fact sheets.

#### Project achievements

- Identification of some of the key elements for devising potential strategies to strengthen the conservation and sustainable use of PGRFA.
- A stronger partnership among SHs in PGRFA management within the country.
- Understanding of SHs about the status of their PGRFA.
- Ability of country to monitor changes in PGRFA over time.
- The quality of information about PGRFA status has improved.

## Constraints

- It is not clear which organization is responsible to conduct surveys and inventories.
- National priorities have not been established.
- Insufficient financial support.
- Insufficient staff.
- Staff with insufficient skills.

## Recommendations

### *Nationally*

- The NFP, NWG and any concerned entities must make clear to the government the value of the NISM-GPA database and the importance of ensuring that adequate funds are available to fund all the components needed.
- Foster the NISM within national programmes.
- The activity should be a regular activity under one office and the office would act as a focal point to undertake the activity continuously.

### *Internationally*

- FAO or any international PGRFA network should organize annual meeting after ending of the project to discuss necessary partnerships, coordination and decision-making mechanisms, in the form of the subregional networks that provide policy and technical guidance for the management of the NISM-GPA database.

## Future plans and next steps

- Proposals for expanding the SHs in the northern and southern parts of Thailand.
- Implement access and benefit sharing regulation under the PVP act, that all PGRFA research must submit proposals and reports. With this interaction, information from the proposals certainly will reflect some areas of the GPA.

## **Viet Nam**

### **Final Summary Report on Project “Capacity Building and Enhanced Regional Collaboration for the Conservation and Sustainable Use of Plant Genetic Resources in Asia” GCP/RAS/240/JPN**

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#### **Background**

At the Fourth International Technical Conference on PGRFA (Liepzig, June 1996), 150 countries adopted the GPA. They agreed that its implementation would be monitored and guided by the national governments and other members of FAO and recommended the establishment of a transparent and effective monitoring system. Monitoring the implementation of the GPA and its related activities is essential for establishing priorities, developing future plans and for effectively using the financial resources available both at national and international levels for implementing the GPA. FAO, through the Commission on Genetic Resources for Food and Agriculture, facilitates and guides the monitoring process of GPA implementation at regional and international levels and provides technical assistance to member countries for establishing and improving their National Information Sharing Mechanism (NISM) on GPA implementation.

Viet Nam is situated in the Southeast Asian region, and has rich diversity of PGR. Viet Nam is regarded as one of top ten countries for plant diversity. To enhance awareness of the importance of conserving PGR, the State Commission on Science and Technique (Ministry of Natural Resources and Environment, nowadays) issued provisional regulations on genetic resources management in 1987. The Government of Viet Nam ratified the International Convention on Biodiversity in 1994. Since then, the conservation of PGRFA has become a regular national task in Viet Nam. PGR conservation network system in Viet Nam consists of the Plant Resources Center functioning as the Focal Agency and 19 other related member institutions, located around the country.

Viet Nam is one of the first countries in Asia to establish a NISM-GPA by signing the Letter of Agreement for establishing NISM-GPA of the GCP/RAS/186/JPN project with the FAO Regional Office for Asia and the Pacific (FAO-RAP) on the 4<sup>th</sup> of May 2004. Based on the information gathered through NISM, national programmes can assess the current status of PGRFA in the country, which will assist in identifying the needs and priorities for PGRFA activities. The project has developed a NISM-GPA web site in Viet Nam and the database is accessible by SHs and other interested users. External evaluation of the GCP/RAS/186/JPN project recognized many positive results and also some remaining challenges. Thus, a second phase of the project was recommended.

Viet Nam has continued to participate in implementation of the objectives of the Project “GCP/RAS/240/JPN” which was funded by the Government of Japan. The LOA was signed on the 10<sup>th</sup> of September 2009 and implemented from 2009 to 2011. This Agreement aims to support Viet Nam in strengthening its activities related to information on PGRFA, particularly in relation to institutionalizing and regular updating NISM-GPA, the main monitoring mechanism of the

GPA. The inputs will permit Viet Nam to incorporate updated information from present and new stakeholders into the Viet Nam NISM-GPA database and conduct activities that will strengthen PGR activities in Viet Nam.

The activities under the Letter of Agreement include the following:

- i) Review of NISM-GPA common tables and SH counterparts
- ii) Review of Indicators and Reporting Format for monitoring and implementation of GPA-PGRFA
- iii) Provide training to 25-30 new stakeholders
- iv) Make a TV programme on PGR
- v) Hold a “Biodiversity Year” workshop on PGR activities in Viet Nam
- vi) Add new data from previous and new stakeholders to the NISM GPA database
- vii) Issuing catalogue of specific germplasm to promote germplasm use.

## **Main results and outputs of the Project**

### **2.1 Review of common tables and NISM data base status at the start of project**

In the end of the first phase of the project GCP/RAS/186/JPN, 65 SHs from 5 groups participated in NISM Viet Nam. By the end of 2004, there were only 16 out of 60 stakeholders providing data and information for the National Focal Point (NFP). At the end of phase I, 42 out of 65 SHs provided data for NISM-GPA. However, the data is not sufficient.

- 17 SHs provided only the name of their own institution (Instable).
- 1 SH provided the name and contact person (Instable + Pertable) but did not answer any question in indicators.
- 47 provided the name, contact person and some information in common tables.

### **2.2 Review indicators and reporting format for monitoring and implementation of GPA-PGRFA**

Questionnaires related to 20 priority activities of GPA were reviewed and updated information by all 91 old and new SHs, among which:

- 44 SHs filled in part of the questions.
- 6 SHs filled in over 50% of the questions.
- The remaining 41 SHs filled in under 50% of the questions.

A meeting was held with the participation of SHs involved in NISM-GPA Viet Nam (Total number: 91 units including 65 old SHs in phase I and 26 new SHs in phase II).

In the meeting, both advantages and disadvantages of NISM-GPAFA were discussed:

- The software is relatively easy to understand, easy to use even for those who are not fluent in English (due to the support of each country’s language).

- Some questions in the indicators are difficult, too detailed or too general, sometimes SHs have difficulty answering them correctly.
- Some questions required understanding very clearly all PGRFA tasks, but some SH participants are not involved in some areas. Therefore it difficult for these SHs to provide adequate and accurate information as requested.
- Retrieving data also has difficulties (for example in the project table, searching time of the projects is too long).

### **2.3 Training of new stakeholders**

A training course was held for new stakeholders on the use of the computer application for the NISM-GPA at the Plant Resource Center, Ankhanh, Hoai Duc, Hanoi, 11-12<sup>th</sup> December 2009. The training course was attended by 26 new stakeholders. The trainees discussed NISM and agreed a workplan. Stakeholders agreed to provide the required data by answering the indicator questions in the NISM-GPA software.

### **2.4 Make TV programme on PGR**

A 30 minute TV programme with the title *“On-farm conservation of crop germplasms – Solutions for sustainable agricultural development”* was made and it was broadcast on the channel Sciences and Education of Viet Nam Television in the “farmer’s friend” programme. The programme provided information on on-farm conservation through the use of crop germplasm in some Northern provinces (pomelo in rural districts of Ha Noi, longan in Hung Yen province and yam in Lang Son province). The programme also offered some solutions for maintenance of crop germplasms on-farm.

### **2.5 Organization of the International Biodiversity Workshop**

A two days workshop on strengthening plant genetic resources conservation for food and agricultural towards the International Year of Biodiversity was organized and hosted by the Plant Resources Center (PRC) on 9-10 December 2009, with the participation of over 70 participants, including researchers from the National PGRFA network, relevant decision makers, and 50 researchers from the PRC, representatives from Viet Nam television and Dr. Duncan Vaughan, Chief Technical Advisor of the project GCP/RAS/240/JPN.

In total, 16 papers were presented and discussed at the workshop. The workshop proposed resolutions and priorities for strengthening PGR activities.

- To complete the strategy for the conservation of national plant genetic resources for the period of 2010-2015.
- To develop and implement the project for PGR collecting from all over Viet Nam.
- To strengthen the national PGR conservation network.
- To develop, adopt and implement the regulations on PGRFA conservation, use and exchanges.

## **2.6 Add new data from previous and new stakeholders to the NISM GPA database**

By dispatching the PRC staff to each stakeholder (including 65 old and 26 new SHs), most SH data was checked again and questions posed by SHs were answered, new data and information from SH was collected and added to the database.

- Institution table (Instable): 91/91 SHs provided data for NISM-GPA. Among them, data of 50 old SHs was updated, data of 8 SHs without change in the organization information and data of 7 old SHs was edited and added. Data of 26 new SHs were added to the database of NISM-GPAFA.
- Person table (Pertable): A total of 961 contact persons in NISM-GPAFA Viet Nam, including 447 old ones in phase I and 514 new ones. The information of 70 persons was updated and of 65 other persons was deleted.
- Agreement table (Agrtable): A total of 55 agreement tables, including 44 former SHs 11 new ones added.
- Area table (Aretable) is complete with 113 geographic areas, including 88 old geographic regions in phase I and 25 new geographic regions added. The number of new geographic areas (25) is nearly equivalent to the number of new SHs (26).
- System information table (Systable) has been updated with 10 new information systems from 20 former SHs.
- Project table (Prottable): 1,254 projects have been mentioned in NISM in phase 2, consisting 504 old and 750 new projects.
- Cultivar table (Cultable): There are a total of 10,195 plant varieties, including 9,078 ones in phase I and 1,117 new ones added in phase II.
- Reference table (Reftable): 223 reference tables, including 179 old ones and 44 new ones were reviewed and added.

## **2.7 Issuing catalogue of specific germplasm for promoting use**

The following publications were made (a) catalogue of Cowpea germplasms; (b) catalogue of crop varieties collected from Northwest region of Viet Nam; (c) leaflets of promising varieties.

A catalogue introducing “Elite and promising crop varieties maintained by the National Plant Genetic Resources Conservation Network of Viet Nam” was published and distributed to users. In which, 44 promising varieties of some crops introduced with following information:

- Origin
- Main characteristics
- Cultivation and use

Each variety has been illustrated with the pictures and 200 copies have been printed and widely distributed to users and readers in and out of the PGR system in Viet Nam to promote use of crop genetic resources.

## **The achievements and constraints of project implementation**

### **3.1 Achievements**

- Data on PGRFA collected, systemized, updated and made widely available to people interested compared to the first stage. The number of SHs has increased.
- Distribution and use of crop germplasms increased.
- Partnerships and collaboration between SHs has been strengthened .
- The present situations of PGRFA activities in the country reviewed, achievements and limitations identified.
- The capacity and role of national focal agency (NFP) and stakeholders are enhanced.
- Improve the access to and sharing of information about PGRFA on national, regional and global levels; and enhanced capacity of Viet Nam to meet international reporting obligations.
- Awareness on PGRFA conservation and sustainable use has improved .

### **3.2 Constraints**

- Some SHs have not paid much attention on providing and updating information for NISM-GPA.
- Equipments of some SHs are insufficient, capacity of staff involved in NISM is limited and this affect the quality of information provided.
- Budget for project implementation is limited.

## **Future plan and recommendation to maintain NISM**

From the obtained results, there are some recommendations to maintain and to improve NISM Viet Nam

- Introduce the NISM widely to the people by public media and by the website with full information and an easy way to access.
- Continue to organize training courses for staff that directly participate in and maintain NISM.
- Diversify the tools of information exchange and upgrade equipment for the SHs, especially the National Focal Agency.
- Need to have an annual budget to maintain and improve NISM as a part of the national programme on conservation and use of plant genetic resources.
- Improve the processing speed of the software, modify and repair some disadvantages of the software.
- Need to have continuous support of FAO and Donors for strengthening regional and international integration and collaboration.

## **Acknowledgements**

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## Discussion Session



*Ms. Chutima Ratanasatien makes a point, while Mr. Tran Danh Suu (center) and Mr. Duncan Vaughan listen*



*Ms. Sangay Dema and Mr. Leocadio Sebastian*



*Right-left Mr. Noov Bayarsukh, Mr. Stefano Diulgheroff, Mr. Hisato Okuizumi (back), Mr. Hiroyuki Tanaka, Ms. Fumiko Yagihashi*



*Right to left: Mr. Md. Khalequzzaman Akanda Chowdhury, Ms. Sangay Dema, Mr. Leocadio Sebastian, Mr. Ty Channa, Mr. Makoto Kawase, Mr. K.C. Bansal, Mr. Sutrisno, Mr. Vayaphat Thattamanivong, Mr. Thorng Ra (back) Mr. Tomotaro Nishikawa (back), Mr. Shin-ichi Yamamoto (back) – listen to Mr. Stefano Diulgheroff (foreground)*

*Photographs by Fumihiko Yamasaki*

## Annex I

### Final National Focal Point Meeting Tsukuba, Japan 17 October 2011

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## Annex II

### Programme

#### *Final National Focal Point Meeting of Project GCP/RAS/240/JPN*

*Venue: Tsukuba International Congress Center, Tsukuba*

<b>Session 1</b>	<b>Chairman</b> <i>Leocadio Sebastian</i>
9:00-9:15	Welcome remarks <i>Mr. Yasuro Funaki, MAFF, Japan</i> <i>Mr. Makoto Kawase, Director, Genetic Resources Center</i> <i>Mr. Duncan Vaughan, CTA, Project GCP/RAS/240/JPN</i>
9:15-9:30	<b>Bangladesh</b> <i>Mr. Md. Khalequzzaman Akanda Chowdhury</i>
9:30-9:45	<b>Bhutan</b> <i>Ms. Sangay Dema</i>
9:45-10:00	<b>Cambodia</b> <i>Mr. Ty Channa</i>
10:00-10:15	<b>India</b> <i>Mr. K.C. Bansal</i>
10:15-10:35	<i>Coffee Break and Group Photo</i>
<b>Session 2</b>	<b>Chairman</b> <i>Mr. Ty Channa</i>
10:35-10:50	<b>Indonesia</b> <i>Mr. Sutrisno</i>
10:50-11:05	<b>Lao PDR</b> <i>Mr. Vayaphat Thattamanivong</i>
11:05-11:20	<b>Malaysia</b> <i>Ms. Rosliza Jajuli</i>
11:20-11:35	<b>Mongolia</b> <i>Mr. Noov Bayarsukh</i>
11:35-11:50	<b>Myanmar</b> <i>Mr. Ye Tun Tun</i>
11:50-13:15	<i>Lunch at Epochal International Congress Center Restaurant</i>

### **Session 3**

#### **Chairman**

*Mr. Sutrisno*

13:15-13:30

#### **Nepal**

*Mr. Hari Dahal*

13:30-13:45

#### **Pakistan**

*Mr. Md. Shahid Masood*

13:45-14:00

#### **Philippines**

*Mr. Clarito Barron*

14:00-14:15

#### **Sri Lanka**

*Mr. Ratnasiri*

14:15-14:35

*Coffee Break*

14:35-14:50

#### **Thailand**

*Ms. Chutima Ratanasatien*

14:50-15:05

#### **Viet Nam**

*Mr. Tran Danh Suu*

### **Session 4**

#### **Chairman**

*Mr. Hiroyuki Tanaka, Mr. Stefano Diulgheroff and  
Ms. Fumiko Yagihashi*

15:10-16:10

Discussion Session

16:10-16:25

Closing remarks

*Mr. Hiroyuki Tanaka, Mr. Makoto Kawase and Mr. Duncan Vaughan*

## Annex III

### Study Tour



*Mr. Hari Dahal (left) and Ms. Charlotte Lusty examine wild crop relatives*



*Mr. K.C. Bansal examines wild soybeans*



*Mr. Md. Khalequzzaman Akanda Chowdhury, Mr. M. Shahid Masood, Mr. Ye Tun Tun, Mr. Makoto Kawase, Mr. Takeya, Mr. K.C. Bansal, Ms. Safa Souilem, Ms. Turki Najla, Mr. Stefano Diulgheroff, Mr. Ilyes Dammak discuss Japanese rice*



*A local farmer harvesting taro talks to workshop participants Mr. Shin-ichi Yamamoto (left), Ms. Turki Najla, Ms. Sangay Dema, Mr. P.P.G.W. Ramasiri, Mr. Tolo Iosefa with Mr. Thorng Ra in background points to patch of ginger*

*Photographs by Fumihiro Yamasaki*

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**Quick and partial crop/crop wild relative list for  
Kita Oita, Ibaraki, Japan**

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**Setaria – wild crop relative**

**Buckwheat wild relatives (pink color of flower)**

**Esteracea (yellow color of flower)**

**Shitake – edible mushroom**

**Amaranthus**

**Commi : blue flower**

**Soybean – small, intermediate and large seeded varieties**

**Miscanthus**

**Persimmon – round fruit**

**Onion (Allium – 1)**

**Taro**

**Egg plant**

**Radish**

**Capsicum – red**

**Beans**

**Chinese cabbage**

**Salvia (dark purple flower)**

**Ginger**

**Asparagus**

**Bamboo – 1**

**Imperata cylindrical – wild but in some places roots used**

**Carrot**

**Pumpkin**

**Potato**

**Cucumber**

**Allium – 2**

**Persimmon – elongated fruit**

**Okra**

**Pear**

**Solanum tuberosum (potato)**

**Lettuce**

**Perilla (purple) – 1**

**Camellia**

**Grape**

**Gentian (yellow and pink)**

**Apple**  
**Petunia**  
**Acanthus**  
**Celosia**  
**Pine**  
**Begonia**  
**Perilla (green) – 2**  
**Palm – 1**  
**Hydrangea**  
**Agave**  
**Iris**  
**Sakura – cherry**  
**Gladiola**  
**Jumpers**  
**Kiwi**  
**Marigold**  
**Oryza**  
**Cucurbitaceae**  
**Pumpkin**  
**Potato**  
**Magnolia**  
**Strawberry**  
**Wild hops**  
**Bamboo – 2**  
**Taro**  
**Ginger**  
**Eggplant**  
**Cosmus**  
**Guinea grass**  
**Grape**  
**Chili pepper – green**  
**Trachycarpus fortunei – palm**  
**Agave**  
**Tea plant – Camellia sinensis**  
**Pomegranate**  
**Oryza sativa**  
**Thuja compacta**  
**Crysanthemum – various varieties**

**Canna indica**

**Wild Soybean**

**Solidago canadensis – golden rod – wild plant**

**Trichosanthes cucumeroides**

**Tomato**

**Solanaceae**

**Taraxacum officinale – dandelion sometimes used as a salad**

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