



The International Treaty
ON PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE

Enabling Farmers to Face Climate Change



Second Cycle
of the Benefit Sharing
Fund Projects



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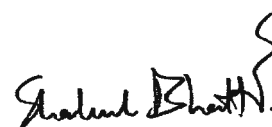
Introduction

This booklet provides an overview of the characteristics and main activities of the projects that are being implemented as part of the second project portfolio of the Benefit-sharing Fund (BSF) of the International Treaty on Plant Genetic Resources for Food and Agriculture. This second portfolio consists of 22 projects that are currently implemented in 33 countries across Africa, Asia, Near East, Latin America and the Caribbean. By the time this booklet is being prepared, the Secretariat is finalizing the agreements for additional eight project proposals that have been approved for funding during the second call for proposals and for which funds have become available during 2013. These additional projects will be implemented in 27 countries across Africa, Asia, Near East, Latin America and the Caribbean and South West Pacific.

The aim of this booklet is to give a general overview of the second project portfolio, as well as to share achievements, best practices and lessons learned during its Midterm phase of implementation. A *Report on the Second Round of the Project Cycle of the Benefit-sharing Fund* will be elaborated at the end of this project cycle and will convey results and achievements in a more comprehensive way, as requested by the Governing Body at its Fifth Session.

The twenty two projects under the second cycle are substantially larger and more comprehensive than the eleven small scale projects funded in the first cycle. Resources are allocated to projects in developing countries that have a focus on helping ensure sustainable food security by assisting farmers to adapt to climate change and are supported by member governments, the private sector and international foundations in a coordinated manner. This second portfolio features two types of projects: immediate action projects and projects that aim at the development of strategic action plans within and across agro-ecological regions.

In just one year, 17.000 farmers, researches, gene bank curators, governmental officials, students and lectures and 215 grassroots organizations have been directly involved and benefited from initiatives sponsored by BSF in this second project cycle. More than 160 institutions are partnering in the execution of project activities and are being involved in all stages of project implementation. 30.900 kg of seeds have been distributed to more than 3000 farmers for multiplication, selection and improvement and progress is made for the individuation of resistant to biotic and abiotic stress crop varieties as to build resilience in the face of climate change and contribute to food security of vulnerable rural communities.



Shakeel Bhatti

Secretary International Treaty on Plant Genetic Resources for Food and Agriculture

Overview of the Project Portfolio

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Selection and implementation

Since the adoption of the Funding Strategy, the Governing Body has been constantly improving the execution of the project cycles of the Benefit-sharing Fund. At its Second Session, the Governing Body adopted the steps for the execution of the project cycle through Annex 3 of the Funding Strategy (the Operational Procedures). At the Third Session, reporting requirements to the Governing Body on the execution of the project cycle were adopted through Annex 4 of the Funding Strategy¹. Procedures for disbursement and for reporting, monitoring and evaluation were adopted at the Fourth Session of the Governing Body and are applied to the ongoing portfolio. At its Fifth Session, the Governing Body has reviewed the *Operational Procedures for the use of resources under the direct control of the Governing Body* and adopted *The Policy on Conflict of Interest and Related Standards of Conduct for the Benefit-sharing Fund*² that will be used in the screening and appraisal of pre-proposals and full project proposals of the Third Call for proposals that has been recently launched.³ All these institutional improvements contribute to the consolidation of the BSF mechanisms and *modus operandi* and contribute to increasing the effectiveness of its initiatives.

The second round of project cycle has been launched in 2010. More than 444 pre-proposals were screened and around 120 project-proposals have been appraised by an independent Panel of Experts. Applications from a wide range of direct beneficiaries in developing countries, including farmers and farmers' organizations, governmental or non-governmental organizations, gene banks and research institutions, regional and international organizations have been received. The most innovative proposals that could be replicated elsewhere have been selected according to their relevance, feasibility, effectiveness and efficiency, benefits and beneficiaries, sustainability, geographic extension and crop relevance.

In August 2011, the Bureau of the Fourth Session of the Governing Body approved the projects to be funded under the second call for proposals of the Benefit-sharing Fund (BSF) and grouped them in three categories: (1) project proposals for immediate funding by the Benefit-sharing Fund; (2) eight project proposals to be funded if additional funding became available in the Benefit-sharing Fund before the end of the biennium (3) project proposals nested in UNDP programmes that were referred to joint resource mobilization with UNDP. This booklet focuses on the 19 project proposals that have been approved for immediate funding and that are currently in their midterm phase of implementation.

¹ <http://www.planttreaty.org/content/resolution-32009-implementation-funding-strategy-treaty>

² http://www.planttreaty.org/sites/default/files/RES2_2013_en.pdf

³ <http://www.planttreaty.org/content/bsfcall3>

The projects under the second portfolio are substantially larger and more comprehensive than the eleven small scale projects supported in the first cycle. Their thematic focus comprises two windows:

Window 1: Strategic Action Plans projects aim to identify information exchange, technology transfer and capacity building activities to cover all areas relating to plant genetic resources in the face of climate change and establish priorities, targets and milestones for future action. Projects have a duration of one year and don't exceed USD 400,000.

Window 2: Immediate Action Projects are expected to have an immediate positive impact on food security and climate change adaptation and to focus on plant genetic resources for food and agriculture listed in Annex I of the International Treaty. Immediate action projects have a duration of two years and don't exceed USD 300,000.

Within the three agreed priorities of the Benefit-sharing Fund, the two windows ensure sustainable food security through activities on the conservation and sustainable use of plant genetic resources for food and agriculture including, *inter alia*:

- The on-farm management of local and introduced genetic diversity (varieties bred by professional plant breeders), both “within” crop diversity and “between” crops;
- Farmer participatory breeding and selection;
- Rescuing farmer varieties threatened by climate change;
- Conserving and making available local and indigenous knowledge;
- Developing outlets for local crops and varieties; and
- Linking farmers nationally, regionally and internationally to promote material and information sharing related to climate change.

All these activities are envisaged to have the potential to be scaled up across agro-ecological zones and replicated in other areas, ensuring maximum positive impact and best use of current scientific knowledge and data.

Funds received and disbursed

The Funds made available for the second cycle of the Benefit-sharing Fund projects multiplied by ten those disbursed in the first round of the project cycle. Most of the portfolio has been financed by voluntary contributions made by Contracting Parties: Italy, Spain, Norway, Australia and Ireland. A Grant Agreement has been signed between the Secretariat and IFAD that has pledged funds to sponsor five Window 2 projects (Malawi, Indonesia, Zambia, Tunisia and Ethiopia).

Table 1: *Contributions to the second round of the project cycle of the Benefit-sharing Fund*

Donor	Contribution (US\$)	Relative share
IFAD	810,525.00	14.4%
Italy	810,530.92	14.6%
Spain	2,218,935.00	41%
Norway	101,368.54	2%
Australia	870,000.00	16%
Ireland	659,800.00	12%
Total	5,471,159.46	100%

More than 50 institutions have mobilized about 4,474,024 USD in co-funding to match and complement the BSF funding for the second round of the project cycle. This trend demonstrates the high quality of BSF projects and that BSF initiatives are of common interest to a wide range of stakeholders around the world.

Figure 1: *Benefit-sharing Fund funding and co-funding in the second project cycle*

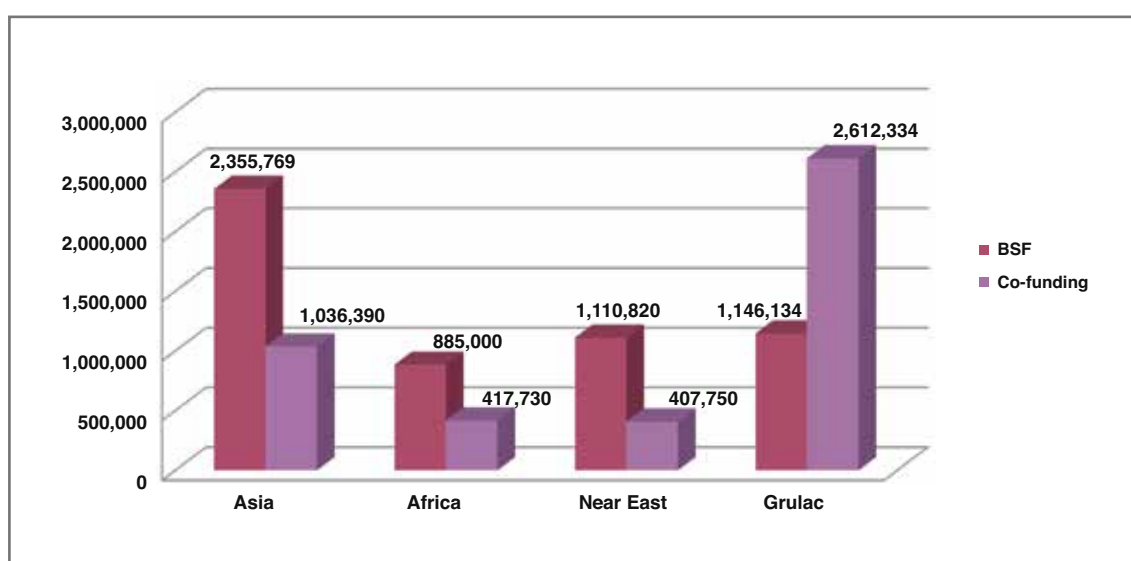
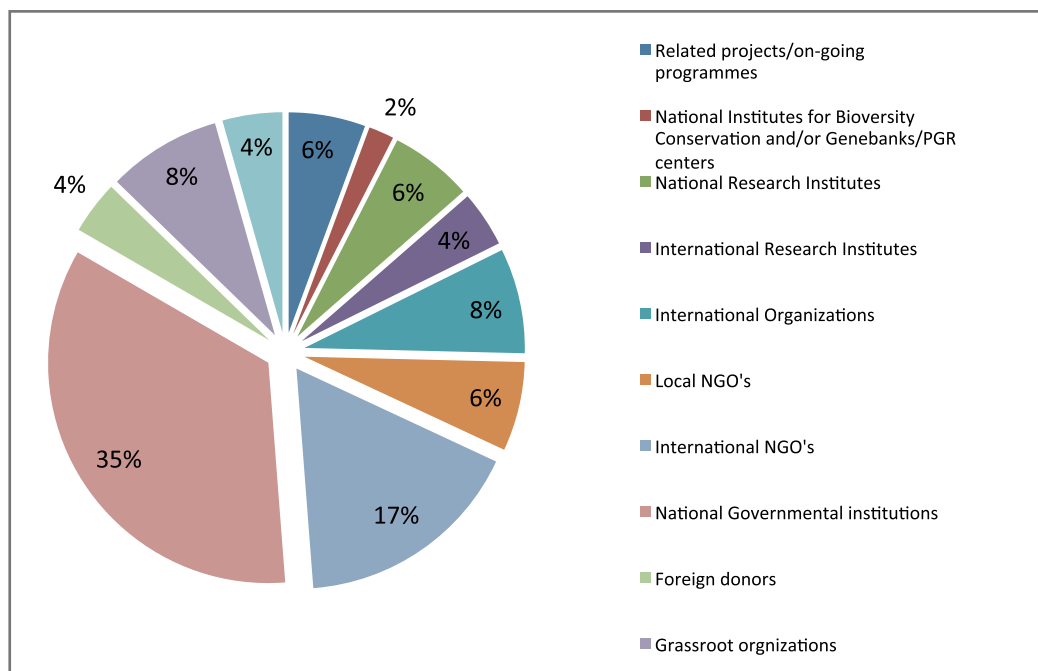


Figure 2: Co-funding by type of institution in the second BSF project cycle

Disbursements for the project proposals funded in the second round of the Benefit-sharing Fund are carried out in accordance with the provisions of the Letters of Agreement signed with the executing institutions. Payments are contingent upon the approval of *Implementation Reports*, which include reporting on results and incurred expenditures, duly signed and certified by the designated official of the executing institution.

By the time of this document preparation, 79.3 % of the funds for the second Benefit-sharing Fund cycle have already been disbursed to the executing institutions.

Table 2: Disbursement situation of the second project portfolio (as of 10/03/2014)

	Total	Window 1	Window 2
Allocated funds	5.497.773,00	2.478.277,00	3.019.496,00
Funds disbursed	4.361.472,00	1.969.626,00	2.391.846,00
Funds to disburse	1.136.251,00	508.601	627.650

Figure 3: *Second project cycle: allocation of funds by region*

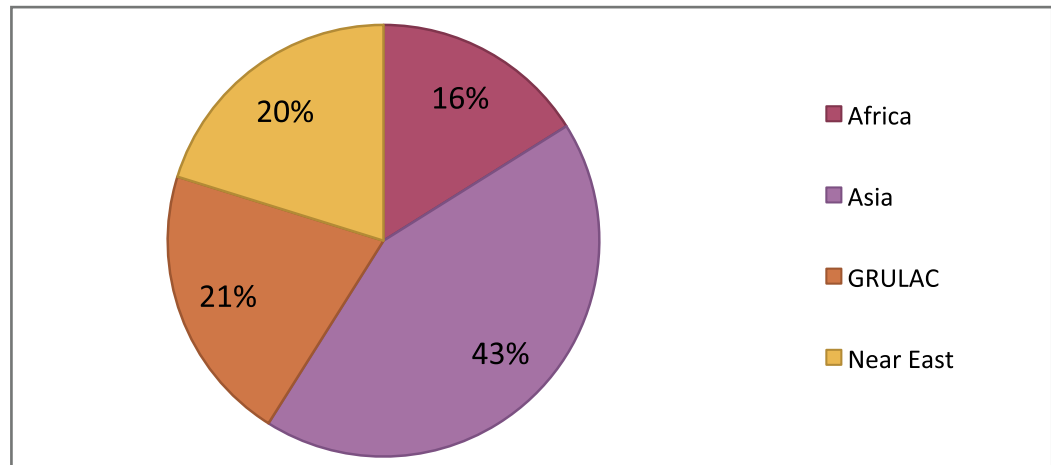


Figure 4: *Window 1- Summary of disbursement status (as of 10/03/2014)*

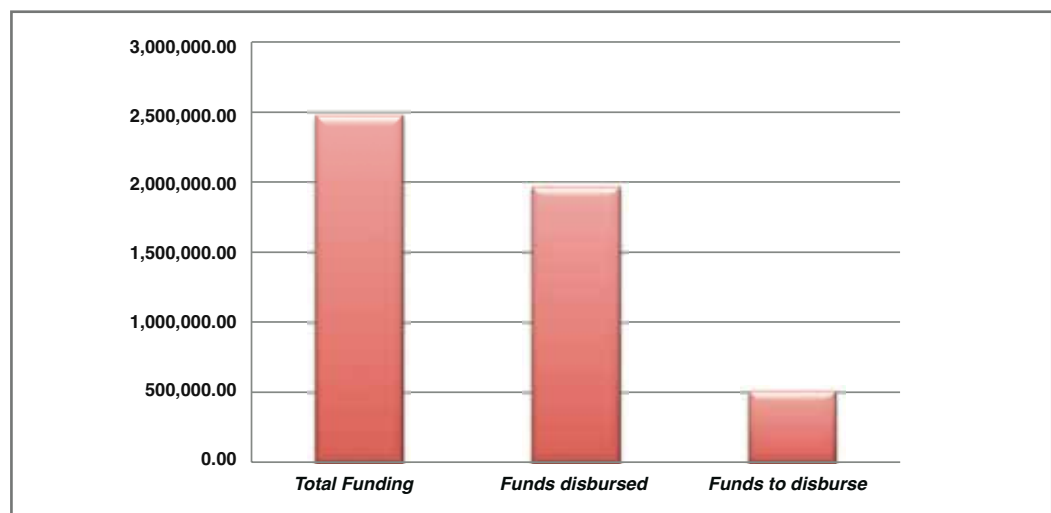
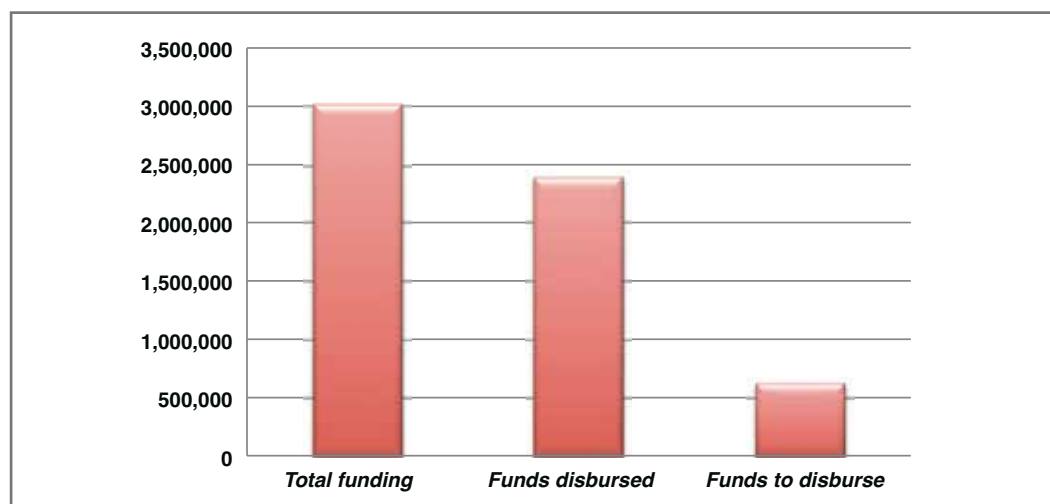


Figure 5: *Window 2 - Summary of disbursement status (as of 10/03/2014)*

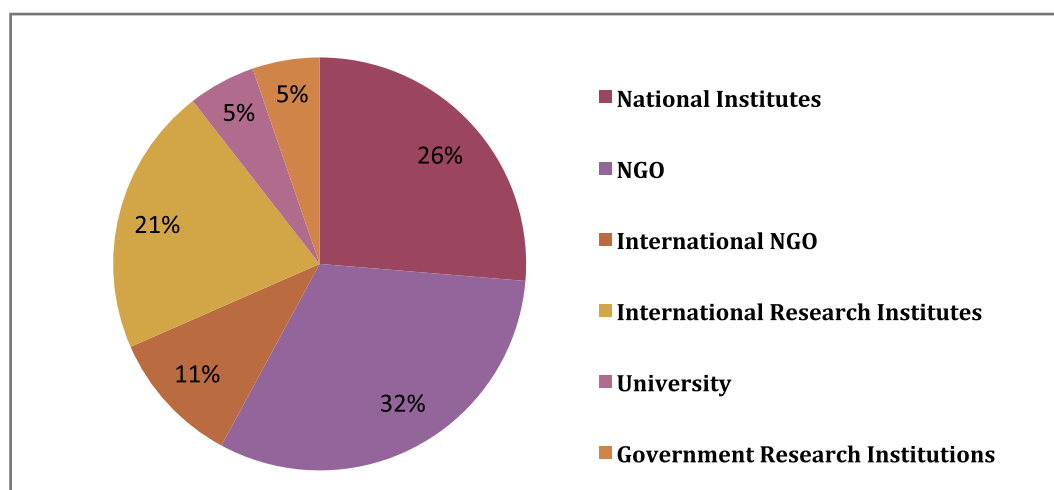


79.5 % of the total funds allocated to Window 1 projects have been transferred to the executing institutions, whereas for Window 2 projects, 79.2 % of allocated funds have been disbursed⁴. Final payments will be carried out upon the approval by the Secretary of the Results as well as the Financial Reports and Plans of Inclusion of Material in the Multilateral System.

Progress update

The urgency of the situation and enormity of the challenges that our world is facing requires coordinated efforts across disciplines and relevant funding mechanisms. There is a wide range of institutions involved in the execution of the second round of Benefit-sharing Fund projects including governmental organizations, NGO's and national and international research institutions.

Figure 6: Types of executing institutions⁵ in the second project cycle



For the ability of the Benefit-sharing Fund to implement its priorities during the second project cycle, a special emphasis has been drawn to the catalytic potential and the multiplier effect that partnerships can play in enhancing impact and sustainability of the BSF funded activities. The 19 institutions responsible for the execution of the BSF sponsored projects are working together with more than 160 partnering institutions⁶ among donor countries, universities, institutes

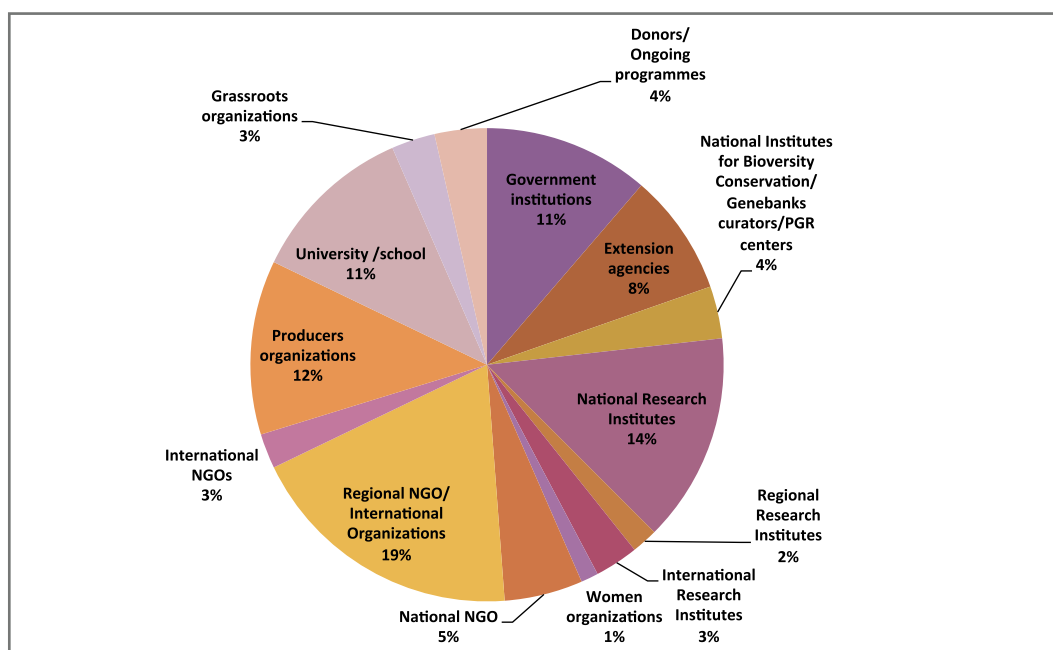
⁴ The difference in the share of funds disbursed for Window 1 and Window 2 projects is due to the different duration of the projects and a consequent difference in reporting and monitoring schedule.

⁵ Executing institutions are any governmental or non-governmental organization, including NGO's, national or international organizations based in developing countries that are also Contracting Parties to the Treaty that can apply for funding as per decision of the Governing Body and are eligible to prepare and implement projects receiving assistance from the Fund. Project Agreements (LoAs) are signed between the Secretariat and the executing institutions.

⁶ Partnering Institutions are those institutions having formal agreements with the executing institutions in the implementation of project activities.

for biodiversity conservation, international organizations, governmental and non-governmental organizations, genebanks and national and international research institutes to facilitate the execution of the second cycle by linking the BSF activities to broader initiatives and strengthening cross-border cooperation.

Figure 7: Partnering institutions involved in the execution of the second BSF cycle



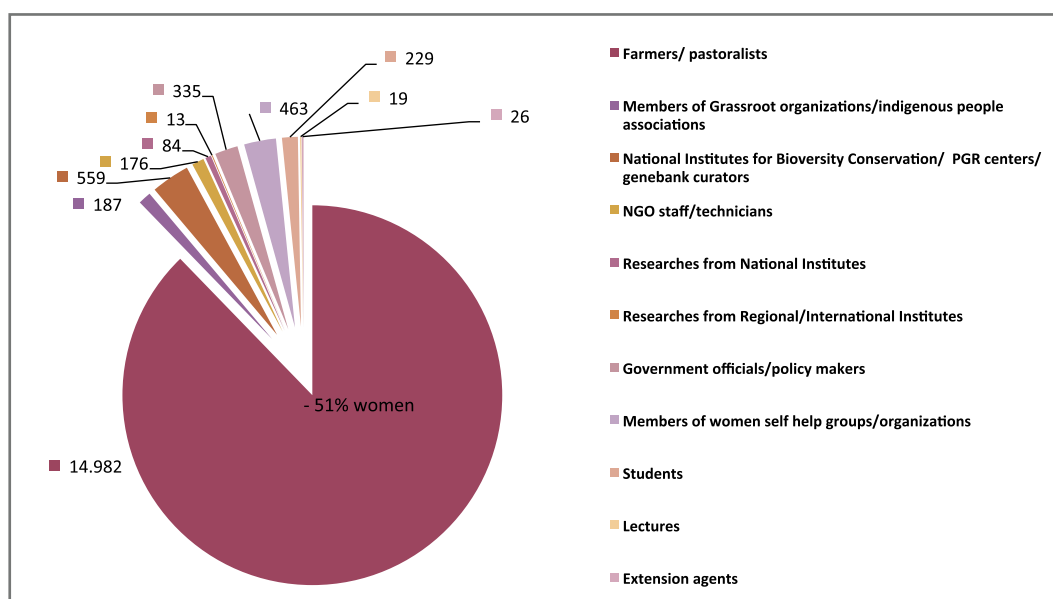
The wide range of institutions and stakeholders involved in this second portfolio represents innovative partnerships between research centers, farmers, civil society, and public/private sector leaders at all levels. This is helping establish integrated approaches to global challenges from a PGRFA perspective in areas where a real opportunity exists for advances in crop diversity to improve nutrition and create more sustainable livelihoods.

Farmers' knowledge and their socio cultural dimensions, systems and institutions are integrated in all project activities and the role of local communities in securing access to and control over their biological diversity is being broadly recognized and highly prioritized. So far, it is estimated that 17,073 (51% women) farmers and 215 among grassroots organizations have been directly involved in field activities, surveys, seed fairs, community biodiversity registers, training and capacity building, participatory variety selection, plant breeding and establishment of community seed banks.

Farmers are involved in collection, characterization, evaluation and development of new varieties of rice, maize, potato, wheat and barley and compilation of synthesis information of existing diversity. All these activities are projected to be consistent with national strategies and priorities and rely on existing scientific and policy back up. Partners in Indonesia, for instance, have individuated an

improved variety of rice (*INPARA 3*) which demonstrated adaptability to floods with yields being two fold. In Morocco, selection and evaluation has resulted in the identification of 14 faba bean varieties tolerant to chocolate spot disease. In India, 15 wheat varieties, resistant to biotic stresses and with high yield potential have been individuated and planted in farmers' model fields where farmers are replicating varietal trials. Similarly, 13 of the better performing rice varieties from the project's varietal trials conducted in 2012 have been taken up for the second year. Partners in Iran and Jordan are implementing Participatory Plant Breeding and Evolutionary Plant Breeding Programme for giving a large number of farmers access to a great amount of biodiversity. Farmers and scientists, in close collaboration, have already sown 16 mixtures of wheat and 21 mixtures of barley in 13 provinces where populations are left to evolve in a multitude of environments, chosen by farmers and characterized by single biotic and abiotic stresses or combination of stresses and under different types of agronomic management. Some populations have already demonstrated high yield potential and resistance to drought and farmers are multiplying and cultivating these populations on a wide scale.

Figure 8: *Direct beneficiaries of the second project portfolio (as of 30/12/2013)*



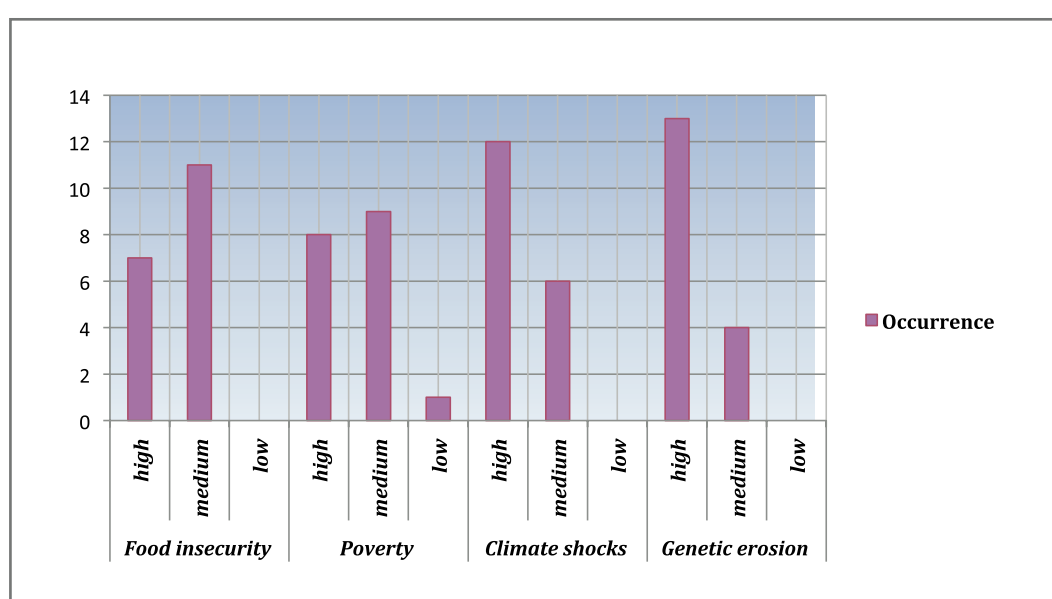
To help secure local seed systems and facilitate sharing of information on seed development, BSF partners have set up Seed Clubs. Similarly, biodiversity fairs and farmer exchange visits have been taking place in Brazil, Costa Rica, Bhutan, Guatemala India, Jordan, Iran, Morocco, Tunisia and Peru, thus providing excellent opportunities for exchanging knowledge, building on established good practices and giving farmers the opportunity to showcase seed collections that are representative of their selection and conservation practices.

Site-specific studies have been undertaken to create strong baselines and project

activities shaped according to identified community needs from a bottom up perspective. In fact, vulnerability assessments and household surveys have been carried out at community level in 22 countries involving more than 6139 farmers (40% women) to assess needs and threats and identify the appropriate coping strategies *vis-à-vis* PGRFA.

The areas of intervention of this second cycle are all vulnerable to food insecurity, poverty, climate shocks and genetic erosion.

Figure 9: Vulnerability of project areas to socio-environmental challenges



The importance and the need for capacity building and awareness raising is highly prioritized in the second BSF cycle projects. A special attention is being paid to the enhancement of human and institutional competences to conserve and sustainably use PGRFA. In one year, 6743 among farmers, extension agents, researches and governmental officials have benefited from training sessions on characterization, evaluation and breeding of crop varieties as well in on-farm conservation and management of PGRFA. Exchange visits, workshops, development of rural extension networks for conserving and using crop diversity on-farm and the establishment of field schools for training of local communities represent just a part of the initiatives underway for capacity building.

The BSF projects also emphasize the importance of gender differentiated traditional knowledge and the adoption of gender-equitable approaches. Over 7000 women are directly involved in activities aimed at ensuring conservation and biodiversity-based livelihoods. For example, partners in India are engaging 138 women Self Help Groups (SHG) in field activities and partners in Jordan and Iran are implementing gender-sensitive plant breeding programs. Seed Clubs have been set up to secure local seed systems, facilitate discussion and sharing of information on seed development. Similarly, biodiversity fairs and farmer exchange

visits are occurring in Bhutan, Guatemala India, Jordan, Iran, Morocco, Tunisia and Peru. These are excellent opportunities for sharing, interacting, exchanging knowledge and build on established good practices. More importantly, this gives farmers the opportunity to showcase seed collections that are the result of their selection and conservation practices.

Throughout the BSF sponsored projects, best practices to increase or maintain crop diversity in farmers' fields are being coupled with those for sustainable intensification to contribute to better conservation of soil and water sources. In India, farmers have been trained in a system of rice intensification and are implementing this ecologically friendly, low labor and cheap option for higher yields in their fields. Farmers in Malawi, where water availability is becoming an issue, are experimenting with drought tolerant crops and varieties, and thus also contributing to efficient water management. Our Peruvian partners are coping with the deterioration of soils and water sources, including through use of appropriate germplasm and the introduction of organic fertilizers in potato fields. In Bhutan, farmers use farmyard manure for the cultivation of traditional rice varieties and green manure plants for improving soil nutrients before sowing the rice.

Treaty partners in Nepal, Jordan, Brazil and the Democratic People's Republic of Korea have established South-South cooperation. Joint training and capacity building have been organized by Local Initiatives for Biodiversity, Research and Development (LI-BIRD) involving 11 developing countries. Similarly, our partners in Bhutan have organized a study visit to Nepal to assess ways to establish and manage Community Seed Banks and come up with modalities for strengthening their own existing conservation systems in Bhutan. Our partners in Jordan have organized, for the first time in their region, an International Farmers' Conference where farmers from six Near East have shared knowledge and good practices on participatory plant breeding. Similarly, stakeholders from Brazil, Panama, Costa Rica, Nicaragua, Honduras, El Salvador, Guatemala and Mexico met to discuss and exchange information and knowledge on climatic change, use and management of agricultural biodiversity, food safety, new instruments for protecting agricultural biodiversity, and the improvement of agricultural systems and carbon emissions.

All these activities reflect established BSF priorities and have the potential to replicated across agro-ecological zones. Most importantly, they contribute towards keeping farmers ahead of the climate change curve, working now to produce seeds that will be adapted to the changing environmental conditions and create an enabling knowledge base for facing future challenges.

Table 3: Crops addressed in the second round of the project cycle of the Benefit-sharing Fund

Host country of project	Type of executing entity	Crops addressed
Window 1 - Strategic Action Plans		
Brazil	Non-governmental organization	<u>Cassava</u> (<i>Manihot esculenta</i>), <u>beans</u> (<i>Phaseolus</i>), <u>pea</u> (<i>Pisum</i>), <u>sorghum</u> (<i>Sorghum</i>), <u>pumpkin</u> , <u>pineapple</u> , <u>passion fruit</u> , <u>watermelon</u> , <u>rice</u> (<i>Oryza</i>), <u>okra</u> (<i>Caryocar brasiliensis</i>), <u>umbu</u> (<i>Spondias tuberosa</i>), <u>coconut</u> (<i>Butia capitata</i>), <u>mangabeiras</u> (<i>Hancornia speciosa</i>)
Costa Rica	International Research Institute	<u>Maize</u> (<i>Zea</i>), <u>bean</u> (<i>Phaseolus</i>), <u>cassava</u> (<i>Manihot esculenta</i>), <u>sweet potato</u> (<i>Ipomea</i>), <u>squash</u> (<i>Cucurbita</i>) <u>amaranth</u> (<i>Amaranth</i>), <u>pepper</u> (<i>Capsicum</i>), <u>papaya</u> (<i>Carica papaya</i>), <u>avocado</u> (<i>Persea</i>).
Nepal	Non-governmental organization	<u>Rice</u> (<i>Oryza</i>), <u>maize</u> (<i>Zea</i>), <u>sorghum</u> (<i>Sorghum</i>) <u>oats</u> (<i>Avena</i>), <u>finger millet</u> (<i>Eleusine</i>), <u>pearl millet</u> (<i>Pennisetum</i>), <u>rye</u> (<i>Secale</i>), <u>beans</u> (<i>Phaseolus</i>), <u>chickpea</u> (<i>Cicer</i>), <u>cowpea et al.</u> (<i>Vigna</i>), <u>faba bean</u> (<i>Vicia</i>), <u>pigeon pea</u> (<i>Cajanus</i>), <u>cassava</u> (<i>Manihot</i>), <u>potato</u> (<i>Solanum</i>), <u>yams</u> (<i>Dioscorea</i>).
Philippines	Regional non-governmental organization	<u>Rice</u> (<i>Oryza</i>), <u>maize</u> (<i>Zea</i>), <u>barley</u> (<i>Hordeum</i>), <u>wheat</u> (<i>Triticum et al.</i>) <u>finger millet</u> (<i>Eleusine</i>) <u>sorghum</u> (<i>Sorghum</i>)
Republic of Korea	National Institute	<u>Potato</u> (<i>Solanum</i>), <u>rice</u> (<i>Oryza</i>), <u>maize</u> (<i>Zea</i>), <u>wheat</u> (<i>Triticum et al.</i>), <u>barley</u> (<i>Hordeum</i>), <u>potato</u> (<i>Solanum</i>).
Sudan	National Institute	<i>Sorghum vulgare</i> , <i>Andropogon gayanus</i> <i>sorghum</i> , <i>pearl millet</i> (<i>Millet pennisetum</i>), <i>Desmodium dichotomum</i> , <i>Rynchosia mimnonia</i> , <i>Aristida papposa</i> , <i>Brachiaria obtusiflora</i> <i>Blepharis edulis</i> , <i>Ischaemum ischaemoids</i>
Tunisia	Non-governmental organization	<u>Tomato</u> (<i>Solanum lycopersicum</i>), <u>pepper</u> (<i>Capsicum</i>), <u>eggplant</u> (<i>Solanum</i>), <u>maize</u> (<i>Zea</i>), <u>parsley</u> , <u>carrot</u> (<i>Daucus</i>)

Host country of project	Type of executing entity	Crops addressed
Window 2 - Immediate Action Projects		
Bhutan	Government Research Institution	<u>Rice</u> (<i>Oryza</i>)
Guatemala	University	<u>Maize</u> (<i>Zea</i>) and <u>beans</u> (<i>Phaseolus</i>)
India	Non-governmental organization	Rice (<i>Oryza</i>)
India	Non-governmental organization	<u>Rice</u> (<i>Oryza</i>) and <u>wheat</u> (<i>Triticum et al.</i>)
Indonesia	National Research Institute	<u>Rice</u> (<i>Oryza</i>), <u>maize</u> (<i>Zea</i>), <u>sweet potato</u> (<i>Ipomea</i>) and <u>cassava</u> (<i>Manihot</i>).
Jordan/Iran	Non-governmental organization	<u>Wheat</u> (<i>Triticum et al.</i>), <u>barley</u> (<i>Hordeum</i>), <u>rice</u> (<i>Oryza</i>) and <u>maize</u> (<i>Zea</i>).
Malawi	Government Research Institution	<u>Finger millet</u> (<i>Eleusine</i>), <u>sorghum</u> (<i>Sorghum</i>), <u>yams</u> (<i>Dioscorea</i>), <u>pearl millet</u> (<i>Pennisetum</i>), <u>cowpeas</u> (<i>Vigna</i>).
Morocco	International Research Center	<u>faba bean</u> (<i>Vicia</i>)
Peru	Non-governmental organization	<u>Potato</u> (<i>Solanum</i>)
Tunisia	International Research Center	<u>Barley</u> (<i>Hordeum</i>) and <u>wheat</u> (<i>Triticum spp.</i>).
Zambia	National (Zambian) NGO	<u>Sorghum</u> (<i>Sorghum</i>), <u>pearl millet</u> (<i>Pennisetum</i>), <u>cowpea</u> (<i>Vigna</i>), <u>bean</u> (<i>Phaseolus</i>), <u>sweet potato</u> (<i>Ipomea</i>) and <u>cassava</u> (<i>Manihot</i>)



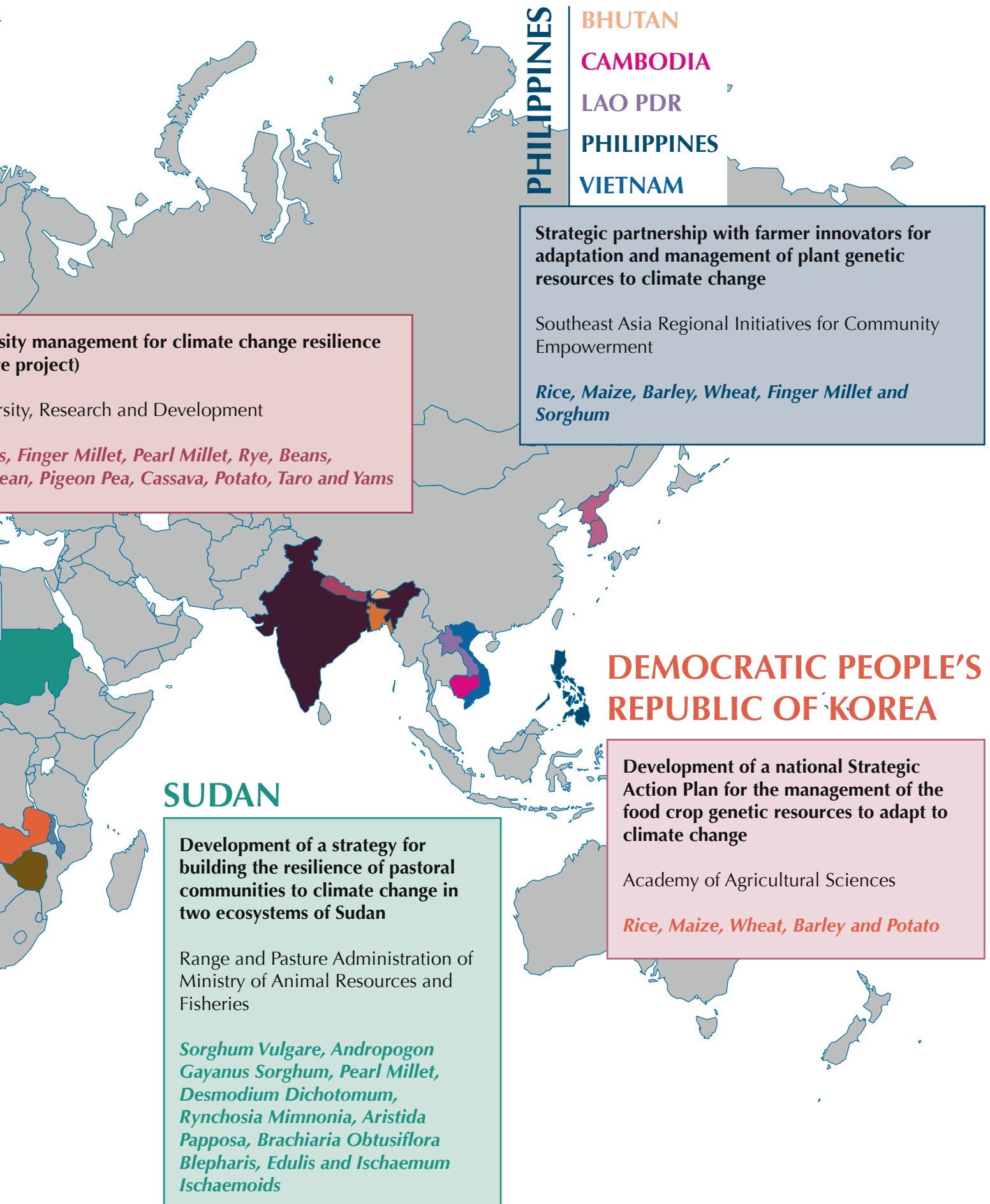
Window 1

Strategic Action Plans

SECOND FUNDING CYCLE OF THE BENEFIT-SHARE



ARRING FUND: Window 1 – Strategic Action Plans





Brazil	23
Costa Rica	25
Democratic People's Republic of Korea	27
Nepal	29
Philippines	31
Sudan	33
Tunisia	35



Brazil



Project title

Shared management and use of (agro) biodiversity by indigenous and traditional communities from the semi-arid region of Minas in Brazil.

Overall objective: Develop a strategic action plan to increase food security of indigenous and traditional communities from the semi-arid region of Minas Gerais in a climate change context.

Crops addressed: Cassava (*Manihot esculenta*), beans (*Phaseolus*), pea (*Pisum*), sorghum (*Sorghum*), pumpkin, pineapple, passion fruit, watermelon, rice (*Oryza*), okra (*Caryocar brasiliensis*), umbu (*Spondias tuberosa*), coconut (*Butia capitata*), mangabeiras (*Hancornia speciosa*)

Main activities

- Evaluation and elaboration of adaptation strategies to climate change
- Establishment of shared management of use and conservation of (agro) biodiversity
- Development of (agro)biodiversity legal measures

Implementing institution

Alternative Agriculture Centre of North Minas Gerais State

Related website

www.caa.org.br

OVER 700 PARTICIPANTS, INCLUDING farmers, indigenous people, researchers and technicians from governmental and non-governmental organizations have directly contributed to determining the thematic axis of this project: agricultural biodiversity, agricultural food systems, food security, the semi-arid ecosystem of Minas Gerais, climate change and farmers' rights.

Brazil has a vast number of plant varieties that are vital for building the national economy and guaranteeing food security; nevertheless, a number of factors, natural and manmade, have resulted in a disruption of agro-ecosystems, an erosion of biodiversity and the degradation of traditional communities' food systems.

The Alternative Agriculture Center of Northern Minas Gerais State, a Brazilian NGO, is developing a strategic plan aimed at increasing food security for indigenous and traditional communities of the Minas Gerais region. This region has the highest small farming density in the country, and is characterized by rich socio-biodiversity



where indigenous and traditional communities still manage and retain a significant range of species and varieties of plants that are used for food, medicine and commercialization. Despite this, they suffer from severe food deprivation and low human development.

This plan is focusing on the development of strategies to reduce risks to climate change, identifying and exchanging experiences in shared management of (agro) biodiversity resources, integrating practices and knowledge of indigenous and traditional communities with other farmers, NGOs and government institutions, as well as setting up for further integration of the SAP into national policies and programs.

Besides involving statewide and nationwide governmental institutions, the strategy of this project is centered on the involvement of local and federal authorities in a dialogue with existing social networks such as the Semi-Arid Articulation, National Coalition of Agroecology, Savannah Network, National Commission of Indigenous and Traditional Communities, Citizenship Territories, Rural Territories, and others.

The activities of this project will contribute to the development of new strategies for livelihoods in the semi-arid region of Northern Minas Gerais, build resilience in the face of climate change and empower farmers, indigenous and traditional communities to ensure sustainable livelihoods.

Brazil

Costa Rica

Project title

Participatory and science-based Strategic Action Plan to strengthen the conservation of plant genetic resources and their enhanced use in adapting to climate change in Mesoamerica.

Overall objective: Sustain regional food security and livelihoods under changing climatic conditions based on improved conservation, use of and access to Mesoamerican PGRFA and ultimately contribute to the adaptation of agricultural systems to changing climates in other regions.

Crops addressed: Maize (*Zea*), bean (*Phaseolus*), cassava (*Manihot esculenta*), sweet potato (*Ipomea*), squash (*Cucurbita*), amaranth (*Amaranth*), pepper (*Capsicum*), papaya (*Carica papaya*), avocado (*Persea*)

Main activities

- Monitoring local climate change
- Enhancement of *in situ* and *ex situ* PGRFA conservation strategies
- Identification of material with adaptive traits and enhancement of pre-breeding
- Integration of PGRFA in food security and post-disaster response strategies
- Training and capacity building

Implementing institution

Bioversity International

Related website

www.bioversityinternational.org

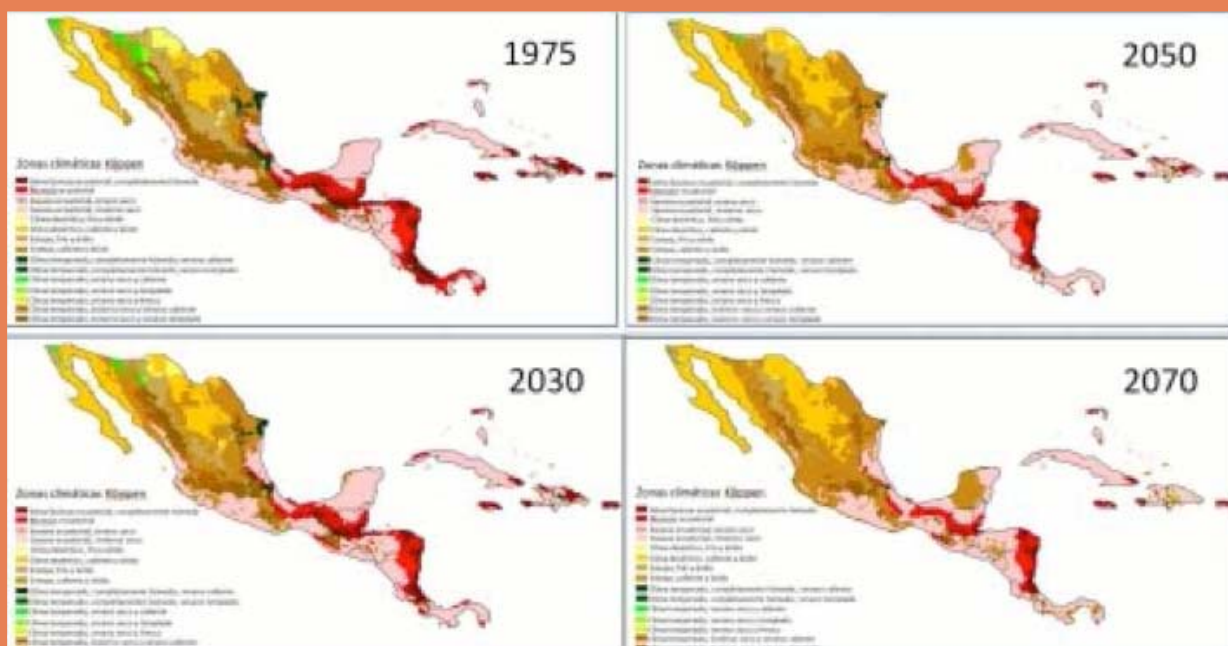


Costa Rica

THIS PROJECT HAS BEEN DESIGNED AS A roadmap for strengthening the conservation and use of Mesoamerican native plant genetic resources as a strategic element for climate change adaptation. It combines analysis of scientific evidence (diagnosis of the status of PGRFA in the region) and broad consultation directly involving 70 experts and more than 200 stakeholders, including representatives from national governments, regional government bodies, academia, regional and international agricultural organizations, civil society and donors. The conservation and use of crop genetic diversity is crucial for the countries of this Region as they are facing major challenges for food security, including loss of unique and irreplaceable crop biodiversity.

Project activities focus on 10 of the most important Mesoamerican crops for local and global food security with potential to generate income. A diagnosis on the status of conservation (*ex situ* and *in situ*), use, and relevant policies related to gene pools of *Zea*, *Phaseolus*, *Manihot*, *Ipomoea*, *Cucurbita*, *Amaranthus*, *Capsicum*, *Carica*, *Persea* and *Tripsacum* had already been formulated. *Ex situ* and *in situ* analysis has included 384 species (26 cultivated and 358 wild).

This project's framework will benefit farming communities by increasing their capacity to adapt to climate changes, diversify agricultural systems and dietary patterns through increased use of PGRFA diversity, and also substantially increase the capacity of decision makers in Mesoamerican countries to respond to food security challenges. The results and underlying principles of this SAP will be integrated in national policies and programs of the target countries in keeping with the commitment of the Council of Ministers of Agriculture of the Agricultural Council of Central America (CAC) in August 2013, which announced the unanimous support for this SAP, and recognized its notable contribution in providing Mesoamerican countries with access to the genetic resources needed to face the challenges of changing climate.



Democratic People's Republic of Korea

Project title

Resources Management to Adapt to Climate Change in the Democratic People's Republic of Korea

Overall objective: Improve the nationwide crop genetic resources management and effectively utilize the genetic resources to adapt crop production to changing agro-climatic conditions, diversify crop cultivation and seek sustainable growth in agricultural production.

Crops addressed: Potato (*Solanum*), rice (*Oryza*), maize (*Zea*), wheat (*Triticum et al.*), barley (*Hordeum*), potato (*Solanum*).

Main activities

- Strengthen national capacity for PGRFA management and adaptation to climate change
- Raising awareness on the importance of PGRFA for food security and adaptation
- Conduct surveys on climate change, agro-ecological conditions and crop genetic resources management
- Promote and improve breeding programs through conventional and modern breeding techniques

Implementing institution

Academy of Agricultural Sciences





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RISE IN TEMPERATURES, DECLINING rainfall and frequent sandstorms in the Democratic People's Republic of Korea (DPRK) have been damaging agricultural production and changing the agro-ecosystems. In efforts to adapt to climate change, the DPRK government has placed utmost priority on developing new varieties of key food crops through better utilization and improved management.

This BSF project aims at developing 11 specific strategies for conservation and utilization of rice, maize, wheat, barley and potato, which account for the largest proportion of people's food consumption in the country and are indispensable for food security. These plans, through the involvement of national decision makers, foreign partners from the Deutsche Gesellschaft fuer Internationale Zusammenarbeit (GIZ), scientists and farmers, aim at improving the management of crop genetic resources nationwide and effectively utilizing the PGRFA to adapt crop production to changing agro-climatic conditions, diversifying crop cultivation and guaranteeing sustainable growth in agricultural production.

Currently, direct beneficiaries, including farmers and governmental officials, have shared in training and discussions on global climate change trends and crop genetic resources management. The first Non-standing Committee for the National Crop Genetic Resources Management to Adapt to Climate Change has been established.

Through this project, Korean experts have participated in a South-North knowledge exchange in Germany, which included visits to research institutes, farms and governmental departments. This was organized by the GIZ with support from the UNFCCC Secretariat and 17 German research institutions.

This project has already directly benefited 1200 farmers, researchers, students and governmental officials, and is expected to involve a wide range of stakeholders in the development of national strategies for climate change adaptation for DPRK's agro-ecosystems.

Democratic People's Republic of Korea



Project title

Community-based Biodiversity Management for Climate Change Resilience (CBM for Resilience Project).

Overall objective: Develop strategic action plans to integrate community based biodiversity management (CBM) as a strategy for on-farm management of PGRFA for sustainable food security and climate change resilience of farming communities in Africa, Central and Latin America and South Asia.

Crops addressed: Rice (*Oryza*), maize (*Zea*), sorghum (*Sorghum*) oats (*Avena*), finger millet (*Eleusine*), pearl millet (*Pennisetum*), rye (*Secale*), beans (*Phaseolus*), chickpea (*Cicer*), cowpea et al. (*Vigna*), faba bean (*Vicia*), pigeon pea (*Cajanus*), cassava (*Manihot*), potato (*Solanum*), yams (*Dioscorea*).

Main activities

- Identify suitable CBM practices to enhance the adaptive capacity of farming communities in 12 countries
- Integrate CBM practices into national, regional and global PGRFA frameworks
- Establish strategic partnerships, networking and information exchange among farming communities and key partners
- Enhancement of community awareness on conservation and diversity of PGRFA
- Organization of multi-stakeholder workshops to identify priorities, targets and milestones for operationalization of CBM in global/regional and national frameworks and programmes

Implementing institution

Local Initiatives for Biodiversity, Research and Development

Related website

www.libird.org

COMMUNITY RESILIENCE IS AT THE CORE of the proposed Strategic Action Plan that LI-BIRD, a Nepalese NGO, is developing in cooperation with partners from 12 countries in Africa, Asia and Latin America under the aegis of this BSF project

The CBM for Resilience Project aims to contribute to strategic plans promoting the use of the Community Based Methodology as a strategy for strengthening on-farm management of plant genetic resources and building resilience through community-oriented processes involving 26 grassroots' organizations associated with resource poor and vulnerable farmers.

LI-BIRD and its partners are conducting participatory diagnoses of climate threats affecting 26 sample sites and are conducting trials to test the best adaptive options available from a bottom up perspective. At each site, partners are focusing on two or three crops within an integrated system of trees, livestock, natural resource bases and water bodies, and are incorporating traditional knowledge and community practices into social systems. The project envisages cooperation between grassroots organizations, NGOs, and scientific and educational institutions in order to ensure evidence-based results and the inclusion of on-farm experiences into the SAP. These organizations work in association with universities that are hosting postgraduate programs relevant to the topic of PGRFA and climate change.

These activities are setting priorities, targets and milestones for the integration of community-based biodiversity management into strategic plans and programs at national, regional and global levels, using grassroots based and scientific processes. The plans are expected to be scaled out to other projects and sites and further integrated into institutional and policy frameworks.

Each country has been able to enhance the capacity of a new generation of scientists by providing support to graduate students and increasing the agro-biodiversity conservation workforce. The activities implemented so far have enhanced the knowledge base of scientists, practitioners and farming communities on agro-biodiversity conservation and reinforced their participation in conserving such diversity.

Since the CBM sites of this project are all already embedded within existing research and development programs implemented by LI-BIRD, the results and knowledge generated by this project are likely to be scaled out and replicated across countries.





Philippines

Project title

Strategic Partnership with Farmer Innovators for Adaptation and Management of Plant Genetic Resources to Climate Change

Overall objective: Strengthen the capacity of smallholder farmers, in particular women and indigenous people, and their communities to manage cereals diversity on-farm for food security and sustainable livelihoods in climate vulnerable regions of Bhutan, Cambodia, Lao PDR, the Philippines and Vietnam

Crops addressed: Rice (*Oryza*), maize (*Zea*), barley (*Hordeum*), wheat (*Triticum et al.*) finger millet (*Eleusine*) sorghum (*Sorghum*)

Main activities

- Map cereals' diversity status, food security status and community coping strategies related to cereals' management
- Mainstream participatory plant breeding of cereals in national research and extension systems
- Elaboration of national response frameworks to climate change
- Support the development of national action plans for implementation of Global Plan of Action and Farmers' Rights
- Training and capacity building
- Develop comprehensive national strategies and action plan for *ex situ* and *in situ* conservation and sustainable use of cereals diversity in Asia

Implementing institution

Southeast Asia Regional Initiatives for Community Empowerment (SEARICE)

Related website

www.searice.org.ph



Philippines

BHUTAN, CAMBODIA, LAOS, VIETNAM AND the PHILIPPINES are all important centers of diversity of staple crops such as rice, maize, barley, wheat, finger millet and sorghum. Despite this fact, these countries are among the poorest in the world with a large part of their populations suffering from severe food deprivation. Even though these five countries have programs to increase cereals productions, food insecurity persists and farmers, who are the main food producers, are the most affected.

Plant genetic resource management plays a vital role for farmers' empowerment in these countries and is also an important tool for ensuring food security, local seed systems, adaptation to climate change challenges and the enhancement of livelihoods.

Through this BSF project, SEARICE aims to strengthen the capacity of smallholder farmers, in particular women and indigenous communities, to manage on-farm diversity of cereals. Furthermore, this SAP envisages supporting the development of comprehensive national strategies for *ex situ* and *in situ* conservation of cereals in Asia, and the building of national response frameworks to the climate change challenges from a PGRFA perspective.

The project complements existing SEARICE programs to mainstream participatory plant breeding and on-farm conservation of food crops within national research and extension systems. They are envisaged to have the potential to be scaled up across agro-ecological zones and be replicated in other areas, ensuring maximum positive impact and the best use of knowledge and financial resources

In Vietnam alone, 83 promising lines of rice have been selected and 33 stable lines released. Farmers produced 63 successful crosses in addition to the 29 crosses from partners' research institutions, and another 10 crosses from farmers' seed clubs.

An estimated 50,000 farmers will ultimately benefit from, *inter alia*, training and capacity building in management of cereals diversity on-farm, plant breeding, on-farm conservation and local seed production.



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Sudan



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Project title

Development of a Strategy for Building the Resilience of Pastoral Communities to Climate Change in Two Ecosystems of Sudan

Overall objective: Building the resilience to climate-induced crises affecting pastoralists and agro-pastoralists in two ecosystems of Sudan to contribute to food security and poverty reduction in the face of climate change

Crops addressed: *Sorghum vulgare*, *Andropogon gayanus* sorghum, pearl millet (*Millet pennisetum*), *Desmodium dichotomum*, *Rynchosia mimnonia*, *Aristida papposa*, *Brachiaria obtusiflora* *Blepharis edulis*, *Ischaemum ischaemoids*

Main activities

- Establish baseline data and assessment of the vulnerability level of target communities
- Research and documentation of the characteristics of *Sorghum Vulgare* and other range plants
- Strengthen capacities of relevant stakeholders and build networks and partnerships in the pastoral sector

Implementing institution

Rangel and Pasture Administration of Ministry of Livestock, Fisheries and Rangelands

Related website

www.rangepasture.org

SUDAN IS ENDOWED WITH A RICH GENE pool of forage plant genetic resources that constitutes a valuable heritage for mankind and contributes to the income and subsistence of a large sector of the population, which is either pastoralist (nomads) or agro-pastoralist. As much as 80% of the population lives in rural areas and relies mainly on agriculture for their livelihood.

The overall objective of this BSF project is to develop a strategy for the conservation and sustainable use of forage genetic resources in the semi-arid, low rainfall Sudanese savannah in order to help agro-pastoralist communities cope with food shortages produced by climate shocks.

The project has, thus far, succeeded in identifying key stakeholders, including the Agricultural Research Corporation, pastoralist unions and meteorological authorities at the federal, state and local levels. Initiatives contributing to capacity building of policy makers, technical staff and local community members have been implemented through capacity building and awareness raising workshops.

A number of technical studies and reports have already been done about this on-going BSF project, focusing particularly on the role of the diversity of natural forage plants in pastoral livelihoods, the role of traditional knowledge in supporting livelihoods, the characteristics of forage sorghum, and the impact of climate change on FPGRs and food security.

This SAP will be incorporated within the national programs to achieve sustainable conservation of forage plant genetic resources and be included as an essential element for longer-term development plans.

This project will also provide the basis for the development of plans directed at improving the livelihoods of pastoral communities in the country, while networking will facilitate the exchange of views and experiences, and contribute to the application of SAP principles in areas with similar environmental and social conditions.

Close to 20,000 households in Butana and Kordofan states are expected to benefit from these BSF project activities, including through the development of skills and knowledge on the proper use and management of forage resources, which are crucial for guaranteeing sustainable livelihoods.



Sudan

Tunisia

Project title

Promotion of the recognition of Globally Important Agricultural Heritage Systems (GIAHS)

Overall objective: Develop and implement a national strategy for the conservation and sustainable management of agro-biodiversity of GIAHS in the historical Gafsa oasis in Tunisia.

Crops addressed: Tomato (*Solanum lycopersicum*), pepper (*Capsicum*), eggplant (*Solanum*), maize (*Zea*), parsley, carrot (*Daucus*)

Main activities

- Development and incorporation of an integrated PGRFA management strategy in the Gafsa oasis
- Revitalization of agricultural practices and local institutions responsible for the maintenance of the diversity in the oasis
- Training and capacity building of local and national actors in the sustainable management of Gafsa's agro-biodiversity

Implementing institution

Association for the Safeguard of Médina of Gafsa

Related website

www.giahs.org



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THE HISTORIC GAFSA OASIS IS A BIODIVERSITY laboratory that has been included by FAO in the Globally Important Agricultural Heritage System (GIAHS) that currently consists of six world pilot sites. This particularly oasis is also the focal point of this BSF project. Throughout the world, generations of farmers have created, shaped and maintained unique agricultural systems and landscapes that have sustainably supported human livelihoods for centuries, but are currently subject to deterioration and erosion. Several workshops have been organized for local and national administration offices, research institutions, NGOs and farmers to ensure the sustainable management and conservation of the historic site of the GAFSA oasis, including, in particular, PGRFA. This is an important entry point for the development of legal, technical and practical measures for the promotion of the dynamic conservation of the Oasis at local and national levels. It is envisaged that the enabling environment created through this project will facilitate the adoption by national level authorities of these measures as a framework for action in the forthcoming months.

The BSF projects activities of the Association for Safeguarding the Gasfa Medina are geared towards the development of a national strategy for the conservation and sustainable management of agro-biodiversity of the GIAHS in Tunisia.



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Tunisia

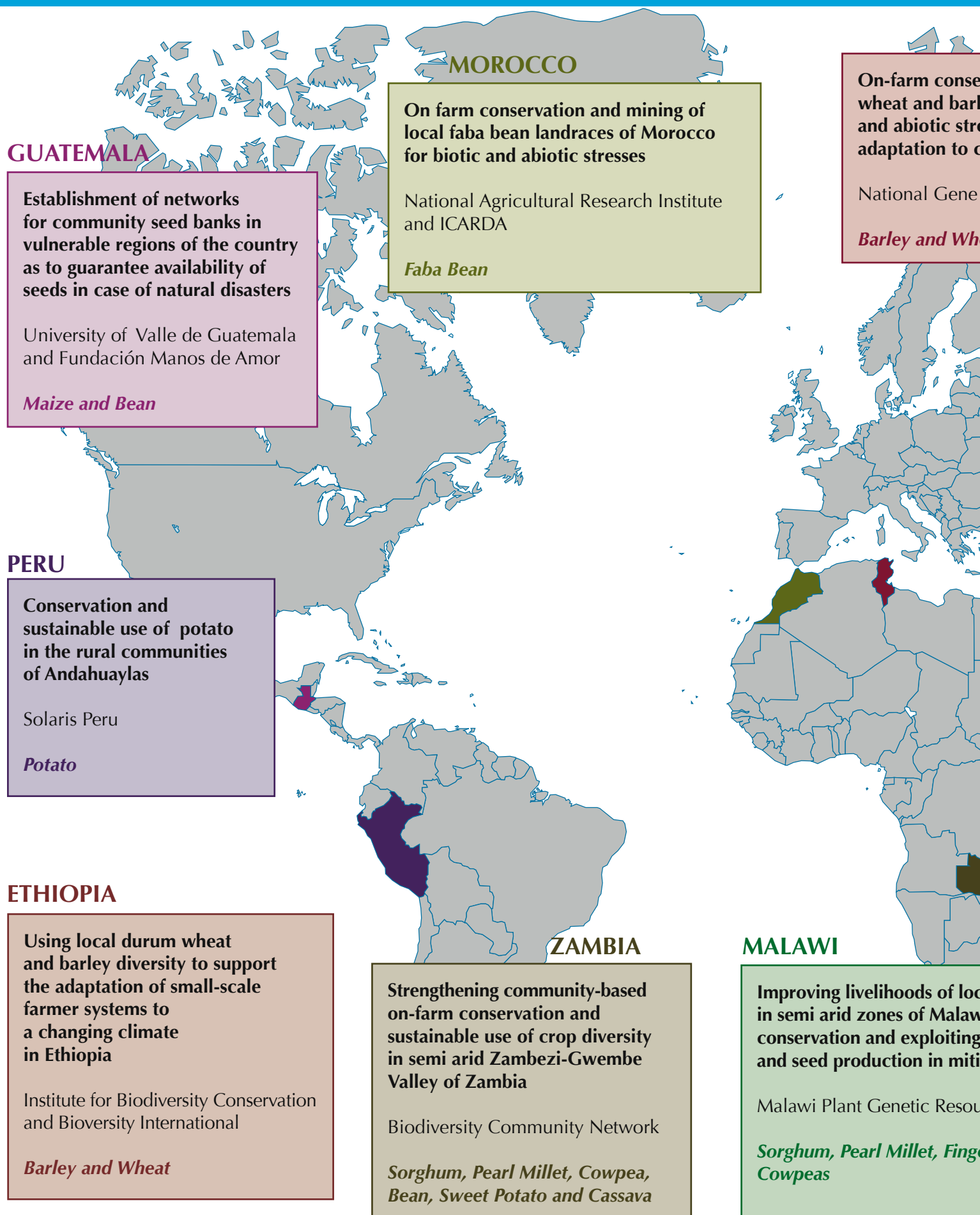


Window 2

Immediate Action Projects



SECOND FUNDING CYCLE OF THE BENEFIT-SHARE



The designations employed and the presentation of material in the map(s) do not imply the expression of any opinion whatsoever on the part of

ING FUND: Window 2 – Immediate Action Projects

TUNISIA

Conservation and mining of local durum wheat landraces of Tunisia for biotic stresses, enhanced food security and climate change

Bank of Tunisia and ICARDA

Wheat

JORDAN / IRAN

Use of genetic resources to establish a multi country program of evolutionary-participatory plant breeding

National Center for Agricultural Research and Extension (Jordan), CENESTA (Iran) and ICARDA

Wheat, Barley, Rice and Maize

INDIA

Using rice genetic diversity to support farmers' adaptation to climate change for sustainable food production and improved livelihoods in India

Gene Campaign and Bioversity International

Rice

Seeds for life-action with farmers in Uttar Pradesh-IGP region to enhance food security in the context of climate change

Humana People to People and Bioversity International

Rice and Wheat

INDONESIA

Management, development and utilization of various crop plants for sustainable food availability

Indonesian Center for Biotechnology and Genetic Resources Research and Development

Rice, Maize, Colocasia, Sweet Potato and Cassava

BHUTAN

Participatory conservation & utilization of rice genetic resources for livelihood and food security

National Biodiversity Centre

Rice

Local communities
involved through on farm
conservation of the genetic potential
for adapting to climate change

Genetic Resources Centre

Wheat, Millet, Yams and



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Bhutan



Project title

Participatory Conservation and Utilization of Rice Genetic Resources for Livelihood and Food Security in Bhutan

Overall objective: Promote Livelihood and Food Security of farming communities through participatory conservation, development and utilization of rice genetic resources

Crops addressed: Rice (*Oryza*)

Main activities

- Participatory Varietal Selection and breeding of locally adapted rice varieties
- Promotion of *in situ* and *ex situ* conservation
- Reduction of the impact of varying rainfall pattern and drought on crop production
- Establishment of Community Seed Banks
- Protection of community water sources and development of management bylaws
- Diversification of cropping system
- Farmers' training

Implementing institution

National Biodiversity Centre, Ministry of Agriculture and Forests, Royal Government of Bhutan

Related website

www.gnhc.gov.bt



Bhutan

THIS BSF PROJECT IS FOCUSSED ON THE poorest areas in Bhutan, where farmers are engaged in subsistence farming of lowland rain-fed and irrigated rice varieties: the provinces of Samtse, Samdrup Jongkhar and Monggar. This project aims at improving food security for these communities by providing access to diverse varieties of rice made available from the National Gene Bank, as well as through the selection in the field of best performing varieties. In addition, income generation will also be enhanced through value addition and marketing of local/traditional rice.

Our partners in Bhutan are implementing participatory selection of high yielding and locally adapted rice varieties, promoting sustainable management and conservation, and strengthening water source irrigation facilities. A baseline survey has been carried out to identify farmer's needs with regard to PGRFA, identify trends in the farming systems, the constraints faced by farmers and shape the project activities from a bottom up perspective. Farmers have already identified and selected a number of varieties of rice, maize, wheat and millet that demonstrate high yields and have the potential to improve their food security situation. In addition, our partners are sourcing and providing improved varieties for the Participatory Varietal Selection. This will, in the long run, broaden the rice genetic base and provide insurance against diseases and pests outbreaks.

A Biodiversity Fair has been organized to give farmers the opportunity to share, interact, exchange seeds and knowledge, and build on established good practices. More importantly, the fair provides the farmers an opportunity to showcase seed collections resulting from their selection and conservation practices.

A study visit to Community Seed Banks and on-farm conservation sites in Nepal has been organized by LI-BIRD, our executing partner for the BSF project in Nepal, to train and build capacity on Community Seed Bank management and further strengthen and up-scale Bhutanese Seed Banks.

By the end of this project, food security of the target communities will be enhanced through access to high yielding rice varieties that have been tested and adapted to varying rainfall patterns and drought. Furthermore, it is envisaged that yields will be improved through proper seed selection, storage and rehabilitation, as well as the adoption of best cropping practices. In addition, a strong knowledge base will be created through capacity building, training and exchanging of experiences.



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Ethiopia

Project title

Using local durum wheat and barley diversity to support the adaptation of small-scale farmer systems to the changing climate in Ethiopia

Overall objective: Contribute to the food security of poor farmers in Ethiopia by providing farmers with access to seeds of locally adapted varieties that suit their climatic conditions and help them to cope with adverse effects of climate change on crop production.

Crops addressed: Barley (*Hordeum vulgare* L.) and durum wheat (*Triticum durum* Desf)

Main activities

- Improve documentation systems for barley and durum wheat
- Identify and evaluate promising local varieties of barley and durum wheat
- Establish market based seed distribution systems
- Training and capacity building of national scientists in documentation systems and GIS techniques.

Implementing institution

Bioversity International and Institute for Bioversity Conservation

Related website

www.ibc.gov.et, www.bioversityinternational.org





Ethiopia

ETHIOPIA HOUSES AFRICA'S LARGEST genebank, with a total holding of 60,000 accessions. This national genebank is maintained by the Ethiopian Institute of Biodiversity Conservation (IBC).

The country, which is rich in agricultural biodiversity and considered a major center of crop domestication in Africa, is characterized by a high percentage of rural poor, high rates of subsistence agriculture and food insecurity, which affects more than 44% of the Ethiopian population.

Diversification of crop varieties is one of the main adaptation strategies available to Ethiopian farmers; however, the majority of them are unable to use different varieties, principally due to the lack of access to seeds and appropriate information.

This BSF project, a partnership between the Ethiopian Institute of Biodiversity Conservation (IBC) and Bioversity International, aims to develop a mechanism to allow Ethiopian farmers access to locally adapted varieties of durum wheat and barley in order to ensure food security, reduce the risk of crop failures, build resilience in the face of unpredictable climatic changes, strengthen national self-sustainability and improve the seed industry through the development of market-based seed distribution systems. This will be achieved by using innovative Geographic Information Systems (GIS) and participatory evaluation practices.

Our partners will make available and distribute seed material of locally adapted durum wheat and barley varieties to farmers in six regions through local seed distribution systems. As a result, Ethiopian farmers will have access to new, tested, locally adapted varieties to better cope with climate change and ensure sustained crop production.

Furthermore in developing a climate profile of the genebank materials from Ethiopian and other collections, the project will add value to the genebank collection and provide options for farmers cultivating within similar climatic conditions.

This BSF project aims to benefit at least 1000 Ethiopian farmers by helping facilitate access to germplasm and information necessary for them to adapt to changing climatic conditions. In addition, the model developed by this project is expected to be replicated in other regions of the country and abroad.

Guatemala



Project title

Establishment of a preliminary network of community seed banks in vulnerable regions of Guatemala to provide seed in the event of a natural disaster

Overall objective: Contribute to the development of measures for adaptation in the face of climate change and build food security through the establishment of community seed banks

Crops addressed: Maize (*Zea*) and beans (*Phaseolus*)

Main activities

- Documentation and conservation of genetic diversity of maize and beans
- Establishment of community seed banks
- Training and capacity building
- Elaboration of a manual on seed conservation and management in community seed banks
- Promote complementarities between *in situ* and *ex situ* conservation of agricultural biodiversity
- Build synergies between Universities, the National Institute for Agricultural Research (INIA), non-governmental organizations (NGOs), farmer groups and international organizations.

Implementing institution

Universidad del Valle de Guatemala

Related website

www.uvg.edu.gt



GUATEMALA IS AMONG THE WORLD'S TOP 10 countries in terms of vulnerability to natural disasters. Models predict that small-scale farmers, particularly those engaged in rain-fed agricultural practices, will be the most affected. Therefore, the adoption of adaptation and mitigation strategies is vital for guaranteeing the livelihoods of local communities.

Activities to safeguard genetic diversity in Guatemala and guarantee material for base broadening activities are being carried out by conserving local biodiversity in seed banks.

This BSF project will promote *in situ* and *ex situ* conservation of agricultural biodiversity and build synergies between Universities, the National Institute for Agricultural Research, NGOs, women's associations, farmers groups and international organizations.

Household surveys have been undertaken to assess: farmers' storage practices, levels of seeds availability and sowing practices, and to document their climate change perceptions and related coping strategies.

Genetic diversity in farmer's fields has been documented, resulting in the collection, evaluation and characterization of samples of maize and beans. Our partners are documenting the existing genetic diversity of maize and beans in the project sites using the *in situ* conservation index (ICi) that has resulted in 44 samples of maize and beans analyzed against 10 qualitative and quantitative traits. Identified data on native genetic diversity has been entered in databases. The Instituto de Ciencia y Tecnología Agrícolas (ICTA) scientists are breeding seeds in order to preserve the genetic diversity present in farmers' fields and to make available genetic material for community seed banks. In addition, a Seed Bank Committee has been established.

Through this BSF project, 150 farmers and their families will benefit directly from capacity building activities and technology transfer for the management of maize and bean varieties in their fields. This will also help to further disseminate knowledge and good practices among their communities. Over 1,355 families representing 8 communities are estimated to benefit from the availability of seeds that are resistant to drought and present preferable gastronomic and economic traits.

Guatemala

India

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Project title

Using rice genetic diversity to support farmers' adaptation to climate change for sustainable production and improved livelihoods in India

Overall objective: Ensure that rural communities are able to maintain and adapt traditional rice genetic diversity and to combine such actions with the introduction of new varieties/landraces

Crops addressed: Rice (*Oryza*)

Main activities

- Identification of rice diversity and elaboration of climate prediction models through the use of Geographic Information System (GIS) technologies
- Establishment of gene bank accession-levels and databases on varieties suitable to climate change
- Increase farmers' access to rice genetic diversity and climate information
- Participatory plant variety selection
- Collection of local rice germplasm and establishment of community seed banks
- Development of local seed-distribution systems
- Training and capacity building in the use of tools for rapid screening of germplasm, GIS and climate-based models

Implementing institution

Gene Campaign and Bioversity International

Related website

www.genecampaign.org

www.bioversityinternational.org

THE INDO-GANGETIC PLAINS OF INDIA are expected to be severely affected by drastic weather conditions, such as drought and heat as confirmed by the study that Gene Campaign has conducted in the frame of this project. In order to successfully meet food requirements in an era of climate change, conservation and sustainable utilization of genetic diversity of crop plants have become crucial. This BSF project focuses on addressing these needs within the Indo-Gangetic plains of India.

The objective is to ensure that rural communities are able to maintain and adapt traditional rice genetic diversity to climate change, and to combine this with the provision of desirable genes for plant breeding and the introduction of new varieties.

The project is updating the passport data of more than 2916 rice germplasm collections stored by Gene Campaign and the National Genebank of India, and is assigning geo-reference coordinates to their respective collecting sites, which are also being mapped for their climate suitability. The entire Indian rice collection is expected to be mapped and analyzed by the end of this BSF project.

Over 400 germplasm accessions from Gene Campaign's community banks and the National Genebank of India have already been identified and their characterization and evaluation databases improved, based on their earlier performance for cultivation. These germplasm accessions have been planted by farmers for testing suitability to their respective climatic conditions. So far, five drought tolerant rice varieties have been identified and two new genes with resistance to Bacterial Leaf Blight have been found. In addition, accessions of finger millet germplasm collected from Uttarakhand are also being grown in farmers' fields and are being evaluated for performance.

Participatory varietal trials have been carried out in villages in the Indo-Gangetic plains and a number of high yielding and traditional upland varieties of rice have been tested in farmers' fields. Farmer Field Schools for Rice have been established and this exercise is expected to be transferred to other rice growing regions like Jharkhand and Orissa. Furthermore, Gene Campaign has developed a Zero Energy Genebank model for the conservation of genetic diversity at ambient temperatures, which is also a model expected to be transferred and shared across rural areas of the country.

This BSF project is expected to benefit 500 farmers in rural communities of India by increasing their access to rice genetic diversity, introducing new varieties, improving the local seed system network, and increasing the capacity of farm women and men to cope with climate change through training programs, which will also improve the technical skills of local community organizations and civil society groups.

India



Project title

Seeds for Life – Action with farmers in Uttar Pradesh to enhance Food Security in the context of Climate Change in India

Overall objective: To contribute to the development of sustainable food security in a rice and wheat producing region vulnerable to climate change in the Indo-Gangetic Plain covering 50 villages

Crops addressed: Rice (*Oryza*) and wheat (*Triticum et al.*).

Main activities

- Establish of 10 genebanks in farmers' fields
- Establish *in situ* seed conservation practices with farmers
- Diversify farming systems by introducing new crops and more varieties of rice and wheat
- Training and capacity building for 900 members of Self-Help Groups and 300 farmers in seed selection and conservation
- Application of systems for rice intensification and improved cultivation methods
- Introduction and cultivation of new crops and more varieties of rice and wheat

Implementing institution

Humana People to People India and Bioversity International

Related website

www.humana-india.org

www.bioversityinternational.org



SUSTAINABLE FOOD SECURITY FOR 50 villages, covering more than 650 families (about 4000 people) in Uttar Pradesh, is the focus of this BSF project. The region is the major rice and wheat producing area of Northern India, with 70% of its 200 million population dependent on agriculture for their livelihoods. This includes female farmers organized into self-help groups, as well as other farmers' clubs for the establishment of System of Rice Intensification techniques, *in situ* seed conservation practices and the diversification of farming systems.

This project has helped establish direct interaction between farmers, field staff and scientists. The active participation of farmers' clubs and women's self-help groups has created a sense of ownership and involvement towards common objectives. These farmers have already been involved in establishing varietal trials, creating nurseries, transplanting and other best practices for sustainable rice intensification. Farmers' fairs and exchange visits have been organized to encourage the exchange of knowledge and good practices.

Since farmers at the selected project sites are very dependent on a few high yielding commercial varieties of rice and the over-use of chemical fertilizers, several new varieties of rice and rice germplasm have been introduced and farmers are participating in varietal trials and in the selection of the well performing varieties for seed multiplication. Furthermore, women have been engaged in nutrition and cooking workshops aimed at including new biodiversity-friendly food products into their daily meal preparation.

In addition to the traditional crops, new crops and more varieties of rice and wheat are being introduced by farmers in the area as optional choices. This project aims to introduce three new crops in the area: Amaranth, Moringa and Quinoa, which may increase farmers' production and income during fallow seasons.

Humana People to People India has succeeded in securing co-financing for sponsoring another project that presents synergies with the *Seeds for Life* initiative, namely, the project *Strengthening Rural Economy and Empowering Women Farmers of Unnao District through Sustainable Livelihood Opportunities*, which targets 10,000 poor women farmers in 200 villages of the Uttar Pradesh region. This initiative will provide 'end-to-end' solutions for women's empowerment through the introduction of better farming methods, diversification of cropping systems, introduction of new crops and creation of links with financial institutions and government programs related to health and insurance. The activities of this co-funded project will contribute to building sustainability of results of the BSF project.

This BSF project is expected to benefit about 4000 people in some of the most vulnerable agricultural communities in India and to engage 450 women's Self-Help Group and 200 farmers' club members in rice intensification and improved cultivation methods.



India

Indonesia

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Project title

Management, Development and Utilization of Various Crops Plants for Sustainable Food Availability

Overall objective: Manage, develop and utilize various crop plants for a sustainable food availability and realize data information about the management and development of crop genetic resources

Crops addressed: Rice (*Oryza*), maize (*Zea*), sweet potato (*Ipomoea*) and cassava (*Manihot*).

Main activities

- Characterization and evaluation of targeted crops
- Conservation of crop genetic resources in farmer's fields
- Diversification of agricultural products
- Training and capacity building in management, development and sustainable utilization of food crops
- Dissemination of information systems

Implementing institution

Indonesian Center for Biotechnology and Genetic Resources Research and Development (ICABIOGRAD)

Related website

www.biogen.litbang.deptan.go.id



THE NATIONAL RESEARCH INSTITUTE OF Indonesia, ICABIOGRAD, is working with farmers to implement sustainable ways for management, development and utilization of rice, maize, colocasia, sweet potato and cassava for ensuring sustainable food availability and improving income and nutrition.

One of the priorities of this BSF project is to counter the lack of seeds for farmers through the dissemination of locally adapted biotic- and abiotic-resistant targeted varieties.

The activities of the project have been developed based on the needs, challenges and preferences of the target population for the cultivation, conservation and utilization of the targeted crops, all of which were identified through a baseline survey conducted beforehand. Subsequently, on-farm conservation activities have been conducted in East Nusa Tenggara for some of the local varieties of maize, rice and beans. Similarly, in North Sumatra, on-farm conservation has been done by including 11 accessions of cassava and 5 accessions of sweet potato in farmyard and by evaluating several rice varieties for tolerance to floods. In addition, characterization against drought, salinity and flood stresses are being performed and improved varieties shared and disseminated.

Two information systems – the National Information Sharing Mechanism (NISM) and the Agricultural Geographic Information System (AGIS) – have been introduced to 50 stakeholders to enable better management, sharing and dissemination of relevant information on PGRFA.

This project is expected to contribute, inter alia, to the development and improvement of farmers' knowledge and skills in management and sustainable utilization of targeted crops, as well as in post-harvesting and processing practices.

Indonesia



Jordan and Iran

Project title

Use of genetic resources to establish a multi-country program of evolutionary participatory plant breeding

Overall objective: Enhance food security by empowering farmers' communities to manage genetic diversity.

Crops addressed: Wheat (*Triticum et al.*), barley (*Hordeum*), rice (*Oryza*) and maize (*Zea*).

Main activities

- Establish and strengthen participatory and evolutionary breeding programs
- Provide farmers with the possibility of producing specifically adapted varieties thus contributing to increasing the sustainability of agricultural production
- Expand landraces collections and document farmers' knowledge
- Establish genebanks and distribute newly developed populations to farmers
- Training and capacity building of farmers in participatory plant breeding and rice crosses
- International Conference on breeding involving six countries from the Near East

Implementing institution

National Center for Agricultural Research and Extension (NCARE), Jordan and Centre for Sustainable Development (CENESTA), Iran.

Related website

www.ncare.gov.jo
www.cenesta.org



FARMERS' KNOWLEDGE IS BEING USED TO support and strengthen national participatory plant breeding programs (PPB) and to start new programs of evolutionary participatory plant breeding (EPPB) in Iran and Jordan by developing locally-adapted varieties of wheat, barley, rice and maize while enhancing biodiversity within and among farmers. Particular attention is being paid during this BSF project to gender-differentiated knowledge of local landraces and cultivation practices. A strategy for facilitating women's access to and control over seeds is also being tested and monitored.

By pro-actively involving women farmers, this project endeavors to empower those who are traditionally in-charge of agronomic practices and entitle them to access and manage relevant PGRFA on a more equitable basis. NCARE and CENESTA are working to adapt local crops to climate change and thus, to mitigate its impact on food security from a gender sensitive perspective.

This BSF project works with farmers to help them cope with climate change and the impact this has on their lives and their food security. It does this by strengthening their agricultural means with solutions such as PPB and EPPB and by using traditional varieties that were lost in previous decades. Activities include the choice of germplasm, participatory trials in 22 villages, evaluation and selection of varieties that are stable in relation to environmental changes and present preferable traits, multiplication and collection. Subsequent base broadening activities will allow farmers to produce specifically adapted improved varieties, thus contributing to increasing the sustainability of their agricultural systems.

The project is also contributing to building capacities and skills of national breeding institutes and NGO practitioners in participatory and gender sensitive breeding methodologies, and providing them with a pool of genetic material for further improvement. This will ensure that project outcomes will be sustained over time and have a multiplier effect in other regions of the two countries.

This project is expected to benefit women and men farmers by strengthening their ability to manage genetic diversity through participatory and evolutionary breeding programs and by expanding the existing collections of wheat, barley, rice and maize in Iran and Jordan. It is also helping build the skills and technical capacity of national breeding institutions, and providing plant genetic material for further improvement.

Jordan and Iran



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Malawi

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Project title

Building sustainable livelihoods through on farm conservation

Overall objective: Improve livelihoods of local communities in semi arid zones of Malawi through identification and promotion of climate change ready crop varieties of sorghum, yams, finger millet, pearl millet and cowpeas

Crops addressed: Finger millet (*Eleusine*), sorghum (*Sorghum*), yams (*Dioscorea*), pearl millet (*Pennisetum*), cowpeas (*Vigna*).

Main activities

- Identify drought-resistant crop varieties and their promotion at local level
- Safeguard genepool of yams, sorghum, pearl millet, finger millet and cowpeas in the face of climate change
- On- farm and *ex situ* conservation of genetic diversity
- Increase farmers' productive capacity and strengthen local seed systems
- Build and strengthen local seed system through on-farm conservation of plant genetic resources for food and agriculture
- Training and awareness raising

Implementing institution

Malawi Plant Genetic Resources Centre, Chitedze Research Station

Related website

www.sdn.org.mw/darts/research/chitedze/chite.htm

THIS PROJECT AIMS TO REINTRODUCE strategic crops in semi-arid zones of Malawi such as yams, sorghum, finger millet and cowpeas. These crops have a high market and nutritional potential, but have been progressively lost and now germplasm is available primarily in genebanks. By reintroducing these crops in farmers' fields, the project aims to benefit poor, food insecure and small-scale farmers.

Sensitization meetings have been organized in 14 project sites to achieve a common understanding and common goals among farmers, scientists, extension officers and governmental officials, one-third of whom are women. Farmers are experimenting with drought tolerant crops and varieties in order to cope with recurrent droughts and contribute to more efficient water management.

In collaboration with all the key stakeholders, production demonstrations have been mounted in all project sites covering 2 crops per site. The demonstrations are being managed by local communities under the close supervision of local agricultural officers, and are acting as learning sites for the production of crops that are not commonly grown in the areas. The major aim of the demonstrations is to impart and share knowledge on cultivation and production practices of the target crops (Farmer Field School Concept).



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This project is working to ultimately improve the livelihoods of 2000 farming families through the identification, production and reintroduction of strategic crops and varieties into local farming systems. In addition to identification of germplasm, the project will accelerate seed production of the identified crops, strengthen local seed systems and traditional seed storage practices, train farmers in participatory variety selection and seed production, and raise awareness on the effects of climate change and how local crop species can contribute to climate change adaptation.

Morocco

Project title

On-Farm Conservation and Mining of Local Faba bean Landraces for Biotic and Abiotic Stresses in Morocco

Overall objective: Enhance on-farm conservation and use of faba bean landraces for food security and to reduce vulnerability to abiotic and biotic stresses

Crops addressed: faba bean (*Vicia*)

Main activities

- Evaluation, selection and identification of useful sources of resistance of faba bean
- Hybridization and incorporation of stress resistance into farmers' preferred faba bean landraces
- Information exchange, technology transfer and capacity building

Implementing institution

International Center for Agricultural Research in the Dry Areas (ICARDA) and the Morocco National Genebank

Related website

www.icarda.org



THE FABA BEAN IS AMONG THE MOST ancient crops in Morocco and is highly embedded in the traditional crop systems. Furthermore, the Mediterranean Basin is the most important center of diversity for faba bean; however, nowadays, frequent droughts, pests and diseases have severely affected the productivity and availability of this crop. The need for *ex situ* and on-farm conservation of faba bean is becoming ever more imperative to cope with food security and climate change, and the local landraces offer an important genepool for sources of adaptation and tolerance to many biotic and abiotic stresses.

The overall objective of this BSF project is to enhance on-farm conservation and use of faba bean landraces for food security through an integrated approach between on-farm, *ex situ* conservation and breeding activities for better management of genetic resources.

These activities are expected to concretely support the progressive development and implementation of adaptation measures for agricultural systems in Morocco and contribute towards establishing mechanisms to address the intertwined issues of food security and climate change challenges.

Lead farmers representing four major faba bean growing areas were selected in cooperation with the Centre des Travaux, which has been working with farmers in their respective regions for several years. The selection of these lead farmers was done to focus on the diversification needs and environmental conditions faced by the farmers in these areas. Under the close guidance of ICARDA, 359 landraces of faba bean conserved in the National Gene Bank of Morocco and 68 accessions collected during project activities have been planted at sites representing four agro ecological zones.

Male and female farmers and scientists are working together to evaluate varieties and productivity of faba beans resistant to drought and heat stresses. The systematic inclusion of farmers' skills, knowledge and preferences is key element. The farmers involved in this project are lead farmers, who are expected to spread and share the knowledge and experience they gain, thus increasing the potential impact of the results of this project on the communities.

Women farmers' associations and organizations are involved in conducting project activities and disseminating information. The project also includes graduate/ masters' students who are doing their research thesis within the project activities. This faba bean project is linked with a similar BSF funded project in Tunisia on on-farm conservation of durum wheat and barley. Consequently, there is a regular exchange of information and experience between Treaty partners in Tunisia and Morocco. These meetings and exchange visits enhance collaborative efforts in the exchange of technology, promotion of intra- and inter-country linkages, research coordination and the dissemination of technology through multi-disciplinary teams consisting of national policy-makers, scientists, extension workers and farmers, and thereby, enhancing long-term sustainability of the efforts initiated through this project.

This project is expected to enhance on-farm conservation and use of faba beans, and initiate targeted hybridization to incorporate stress resistance into the farmers' preferred faba bean landraces in order to improve food security and reduce the vulnerability of local communities to abiotic and biotic stresses.

Peru

Project title

Conservation and sustainable use of potato germplasm in the rural communities of Andahuaylas

Overall objective: Increase production, productivity and income derived from the use and commercialization of potatoes in Andahuaylas

Crops addressed: Potato (*Solanum*)

Main activities

- Increase availability and access to seeds of native potatoes
- Promote *in situ* conservation and sustainable use of potato germplasm
- Implementation of ecological sound techniques for the conservation of soil and water sources
- Encourage and promote farmers associations and market linkages
- Training of Trainees

Implementing institution

SOLARIS Peru

Related website

www.solaris.org.pe



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(PERUVIAN) ANDEAN FARMERS ARE THE CUSTODIANS of more than 4,000 varieties of native potatoes grown mainly at high altitudes. These farmers have difficulties diversifying their production options, accessing local markets and commercializing their products. The conservation of potato genetic resources and an increase in their market value is, therefore, important to guarantee the livelihoods of the Andean farmers who have relied on this for over 8,000 years. It is woven into their belief system, festivals and customs. The Andahuaylan area targeted by this project already suffers a high incidence of rural poverty, so it is critical to help alleviate this situation.

This project seeks to resolve the problem of low production, productivity and income of native potatoes in the province of Andahuaylas. The project will promote the cultivation of varieties of two strategically divided groups of potato – varieties with immediate commercial potential and varieties to be newly introduced to the market – and also contribute to their on-farm conservation, sustainable management and promotion. Fifteen Producers' Organizations are involved in project activities that have already resulted in the establishment of 15 fields for conservation and evaluation of potato varieties against pests, diseases and adaptive capacity. Over 24 varieties have already been evaluated and more than 400 farmers have directly benefited from training and capacity building in the conservation and management of potato genetic diversity.

Partnerships and collaborations with Producers' Associations, local authorities, the Instituto Nacional de Investigación Agraria (INIA) and relevant development institutions have been developed, and negotiations are underway for the establishment of a Colectivo interinstitucional de Promoción del Cultivo y Conservación del Germoplasma de Papa Nativa.

Agro-ecological techniques, environmentally-friendly inputs and a reduced use of agrochemicals have been used to ensure the long-term sustainability of project results. The project also promotes the training of local technicians (TAPs) who will ensure the continuity of technical assistance over time. The gradual incorporation of new native varieties into seed fields will ensure that farmers have multiple options to deal with new climatic scenarios and new pests, and will grant them considerable potential to adjust to changing consumption and market trends.

By the end of this project, more than 1200 Peruvian farmers will be able to cultivate over 200 new varieties of potatoes for subsistence and commercial purposes.

Peru



Tunisia



Project title

On-farm conservation and mining of local durum wheat and barley landraces of Tunisia for biotic and abiotic stresses, enhanced food security and adaptation to climate change

Overall objective: Enhance on-farm conservation and use of durum wheat and barley landraces for food security and adaptation to climate change

Crops addressed: Barley (*Hordeum*) and wheat (*Triticum spp.*).

Main activities

- On-farm and *ex situ* conservation of local landraces of wheat and barley
- Identification of useful diversity and hybridization to incorporate stress resistance
- Information exchange, technology transfer and capacity building in collection, conservation and utilization of wheat and barley.

Implementing institution

International Center for Agricultural Research in the Dry Areas (ICARDA) National Genebank of Tunisia

Related website

www.icarda.org

DURUM WHEAT AND BARLEY ARE THE major staple food crops of Tunisia, occupying one-third of Tunisian cereals' cultivated area. Therefore, there is a need to collect, conserve and sustainably use these precious resources, particularly in the face of recurrent droughts, pests and diseases affecting the country.

This BSF project aims to collect, conserve and mine wheat and barley landraces, as well as multiply the landraces with drought and disease resistance to positively impact income, food security and resilience of poor farming communities. All project activities revolve around the systematic inclusion and acknowledgement of the value of farmers' knowledge, skills and preferences, as well as their active participation in all the phases of project implementation.

Currently, 483 accessions of barley and 7206 accessions of durum wheat landraces have already been planted for seed multiplication at experimental stations. These are being evaluated against disease reactions, pests and abiotic stresses, various phenotypic traits and molecular diversity by farmers and scientists.

These landraces are to be used for 'diversity fairs' and farmers' participatory selection and evaluation. Over 233 landraces of durum wheat and barley conserved *ex situ* in other genebanks have been identified and repatriated for selection and evaluation. Five demonstration plots have been installed, covering all target regions and are being used by farmers for participatory selection of the landraces and evaluation of biotic stress tolerance reactions in different cultivating conditions.

This project is expected to enhance on-farm conservation and use of durum wheat and barley, and to initiate targeted hybridization to incorporate stress resistance into the farmers' preferred local landraces to increase yields and build resilience in face of climatic shocks.



Tunisia

Zambia

Project title

Strengthening Community-Based On-Farm Conservation and Sustainable Use of Crop Diversity in Semi-Arid Zambezi-Gwembe Valley of Zambia

Overall objective: Improve food security and livelihoods of the resource-poor farmers and farming communities in Zambezi-Gwembe valley

Crops addressed: Sorghum (*Sorghum*), pearl millet (*Pennisetum*), cowpea (*Vigna*), bean (*Phaseolus*), sweet potato (*Ipomea*) and cassava (*Manihot*)

Main activities

- Development of new landrace-crop varieties
- Elaboration of crop lists and documentation of indigenous knowledge
- Development of new crop material and its integration in farming systems
- Training of Trainees and restoration of local seed systems

Implementing institution

Biodiversity Community Network

Related website

www.zari.gov.zm

Training of trainees on germplasm characterization tools for the target crops has been conducted with over 600 farmers, including hands-on practical training on recording phenotypic traits of sorghum, bean, cassava and sweet potato. These training of trainees will be replicated at other project sites to promote on-farm PGRFA conservation and sustainable use.

This project is expected to benefit farmers by strengthening crop production and food security, and build up skills for climate change adaptation and landrace restorations in their farming systems.





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