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Investing in rural people

President's report on a proposed grant under
the global/regional window to Bioversity
International for the Use of Genetic Diversity
and Evolutionary Plant Breeding for Enhanced
Farmer Resilience

Note to Executive Board representatives

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For: Approval

Recommendation for approval

The Executive Board is invited to approve the recommendation for the proposed grant as contained in paragraph 16.

President's report on a proposed grant under the global/regional window to Bioversity International for the Use of Genetic Diversity and Evolutionary Plant Breeding for Enhanced Farmer Resilience

I. Background and compliance with IFAD Policy on Grant Financing

1. Of the 3 billion people living in the rural areas of developing countries, 1.2 billion practice low-input traditional agriculture on small family farms using informal sources of seed or planting material. These farmers depend on crop and varietal diversity to cope with unpredictable and severe weather patterns related to climate change, changes in pest populations, low soil fertility and salinization, land degradation and market fluctuations.
2. The proper management and use of traditional and diverse crop varieties have not only shown an increase in farmers' capacities to cope with shocks, but also enhanced yields and yield stability. The diverse crop base of poor farmers is being put at risk by the global uniformity of conventional breeding programmes and production, seed and food systems. This risk is heightened by new and exotic pests resulting from the increased transboundary movement of living organisms brought about by globalization of trade and exacerbated by climate change.
3. Many poor smallholder farmers in the countries participating in this programme – Bhutan, Ethiopia, the Islamic Republic of Iran, Jordan, Nepal and Uganda – live in marginal and variable ecosystems. Wheat, barley, rice and common bean in these countries are important staple crops that are rich in intraspecific diversity and adapted to local conditions. Yet their unique traits are not being adequately capitalized on by conventional national breeding programmes.
4. During the past decades, plant breeders have adopted innovative participatory approaches to crop improvement that are closer to farmers' traditional practices of crop diversity management, taking plant breeding back to farmers' fields. Evolutionary plant breeding (EPB) is one such approach, first introduced in the 1950s. EPB is a dynamic and inexpensive alternative breeding approach in which breeders and scientists partner with farmers, providing them with seeds of mixtures of a diverse range of selected genetic material (including from genebanks, landraces and improved varieties) to plant in their fields. Seeds of varietal mixtures are planted and harvested continuously in target environments and through natural selection and natural crossing in crops, the genetic composition of the crop population harvested is continuously changing, becoming an evolving genebank within farmers' fields. Through natural selection – supported by farmers' selection – genotypes that are better adapted to changing climate trends and local environmental and farm conditions become more frequent. This increases the adaptability and genetic diversity of crops in farmers' production systems, and consequently enhances their resilience.
5. Local seed systems essential for smallholders to maintain their planting material and guarantee household food security are also being weakened by changes in the social institutions and local-level structures meant to sustain them. For

smallholders in remote vulnerable ecosystems, formal seed systems usually do not have sufficient outreach or the diverse set of crop materials needed by farmers to enhance the resilience of their production systems.

6. The proposed programme is in line with the goal and objectives of the IFAD Policy for Grant Financing (2015),¹ contributing directly to achieving objectives (i), (ii) and (iv) of IFAD grant financing. It aims to: (i) promote innovative, pro-poor approaches and technologies with the potential to be scaled up for greater impact; (ii) strengthen partners' institutional and policy capacities; (iii) generate and share knowledge for development impact; and (iv) enhance advocacy and policy engagement.

II. The proposed programme

7. The overall goal of the programme is to sustainably increase crop productivity and enhance resilience to climate change in farming communities under low-input, rainfed and less-favoured production conditions. The objective is to enhance the resilience of targeted low-input poor farmers in the project area by developing evolutionary plant populations (EP) that provide higher and stable yields under local farm agronomic, biotic and abiotic stress conditions.
8. The main target group is composed of poor farmers in Bhutan, Ethiopia, the Islamic Republic of Iran, Jordan, Nepal and Uganda, who will directly benefit from the deployment and management of EP through reduced vulnerability to shocks, increased volume and stability of yields, and enhanced nutritional and market value of their crops. The total number of targeted beneficiaries will be approximately 72,600.
9. Women will particularly benefit from this programme since gender differentiation is built in into the EPB crop selection strategy. Women will be actively targeted as farmers, researchers and decision makers for leadership, management and research roles. Youth will also be a major target group, especially in establishing EP-related enterprises for seed production, product promotion and sales. Researchers and extension agents will be targeted for introducing EPB approaches, and policymakers will be targeted to ensure support in the use of EP and varietal mixtures in national policies, varietal registration and seed system legislation. South-South Cooperation will be an important element of knowledge-sharing and policy support activities. All target groups, including local educational institutions and community-based organizations, will benefit from partnerships built to develop and market EP products and seeds.
10. The programme will be implemented over four years, and will cover wheat, barley, rice and beans. It will have the following components:
 - Component 1: Participatory assessment of the role of plant genetic resources in the resilience of smallholders to climate change;
 - Component 2: Establishment of evolutionary plant populations in farmers' fields and ensuring sustainable seed supply;
 - Component 3: Economic and cost-benefit analysis of evolutionary plant populations and supportive seed supply; and
 - Component 4: Enhancing the policy and regulatory frameworks for using plant genetic resources for food and agriculture in targeted countries.

¹ See EB 2015/114/R.2/Rev.1.

III. Expected outcomes/outputs

11. The programme is expected to have the following outcomes/outputs:

Outcome 1: A gender- and age-sensitive participatory toolkit is used jointly by farmers, researchers, breeders, development workers and extension to design evolutionary plant populations aimed at improving production and resilience for poor farmers under changing climatic conditions.

Output 1.1: A gender- and age-sensitive participatory toolkit for priority trait setting with the farmers for whom evolutionary plant breeding is being developed.

Outcome 2: Women and men farmers have the capacity and receive the necessary institutional support to access, maintain and increase their incomes from the use of evolutionary populations that increase productive gains while maintaining yield stability and ecosystem resilience under changing climatic conditions.

Output 2.1: Evolutionary plant populations are developed and enhanced with a wide range of genetic resources from genebanks, community seed banks and on-farm sources.

Output 2.2: Seed suppliers are diversified and farmers and their groups are integrated into seed value chains for the provision of EPB seeds.

Outcome 3: Results from cost-benefit analysis and cost-efficiency analysis, which include nutritional and environmental value assessment, are used by communities, genebanks, breeders, researchers, extensionists, seed producers and market chain actors to promote use of EP products and seeds.

Output 3.1: Cost-benefit analysis and cost-efficiency analysis, with comparative studies on EPB versus conventional breeding and accompanying seed supply systems, are undertaken.

Outcome 4: Policy options to support the promotion, access and benefit sharing of evolutionary breeding populations are identified and made available to local and national decision makers.

Output 4.1: Actions and recommendations that support the adoption of good practices and policies on access and benefit sharing are developed.

IV. Implementation arrangements

12. Bioversity International (Bioversity), a CGIAR centre, is the grant recipient and executing agency, and is accountable to IFAD for the use of grant funds. Bioversity was selected through a competitive selection process and will lead research and development activities, ensuring quality of outputs, financial management and effective coordination among national partners in the target countries. National research and development partners have been identified, and initial coordination activities have been initiated. Bioversity's institutional accounts are audited yearly in accordance with International Financial Reporting Standards and in compliance with CGIAR financial guidelines. A copy of Bioversity's audited financial statements will be submitted to IFAD within six months after the end of each fiscal year. Annual audit reports submitted to IFAD shall include IFAD funds and any cofinancing funds, and will consolidate expenditures incurred by subgrantees to be accountable for the use of subgrant funds, and will be subject to normal audit oversight.
13. As the overall executing and coordinating agency, Bioversity will disburse and monitor funds through standard letters of agreement with project partners. National cash cofinancing funds for implementation are monitored through financial reports submitted through Bioversity to IFAD. A global team of partners – including national partners – has been established and nurtured through e-mail discussions, visits to partner countries and regional South-South visits.

14. There are no deviations from the standard procedures for financial reporting and audits.

V. Indicative programme costs and financing

15. The overall estimated programme costs amount to US\$5,590,000, comprised of: IFAD grant funding (US\$3,500,000); cofinancing from Bioversity International (US\$1,300,000, mostly in cash); and national partner funding (US\$790,000, mostly in kind). Of the IFAD grant funds, US\$1,600,000 will be transferred to leading national partners and allocated to in-country and South-South activities.

Table 1
Costs by component and financier
(Thousands of United States dollars)

<i>Components</i>	<i>IFAD</i>	<i>Bioversity</i>	<i>National partners</i>	<i>Total</i>
1. Participatory assessment of the role of plant genetic resources in the resilience of smallholders to climate change	677	134	175	986
2. Establishment of evolutionary plant populations in farmers' fields and ensuring sustainable seed supply	1 435	368	272	2 075
3. Economic and cost-benefit analysis of evolutionary plant populations and supportive seed supply	453	98	88	639
4. Enhancing the policy and regulatory frameworks for using plant genetic resources for food and agriculture in targeted countries	453	116	105	674
5. Project coordination, technical management and monitoring	158	206	60	424
6. Overhead	254	378	90	722
7. Cost-sharing percentage (2%)	70	-	-	70
Total	3 500	1 300	790	5 590

Table 2
Costs by expenditure category and financier
(Thousands of United States dollars)

<i>Expenditure category</i>	<i>IFAD</i>	<i>Bioversity cofinancing (in cash)</i>	<i>National partner cofinancing^a (in cash/kind)</i>	<i>Total</i>
1. Salaries and allowances	650	200	300	1 150
2. Operating costs	392	-	100	492
3. Consultancies ^b	586	-	-	586
4. Travel and allowances (including hotels) ^c	492	48	-	540
5. Equipment and materials ^d	186	-	110	296
6. Goods, services and inputs	504	514	190	1 208
7. Training and workshops	366	160	-	526
8. Management fees/overhead	254	378	90	722
9. Cost-sharing percentage (2%)	70	-	-	70
Total	3 500	1 300	790	5 590

(a) National partner cofinancing amounts are based on commitment emails. Salaries and allowances are cash contributions; operating costs, equipment, and services are in-kind contributions.

(b) Consultancies refer to Bioversity staff who are Honorary Fellows or long-term consultants. They are not outsourced consultants. This is a cost-saving method so that research support costs are not automatically charged as staff salaries for non-regular staff.

(c) Travel allocation to Bioversity includes costs for South-South and South-North travel of national partners, Bioversity staff and consultants.

(d) Minimum equipment and material costs per year and per country are estimated at US\$5,000 to US\$9,000. These costs relate predominantly to the purchase of local seeds from farmers, seed planting equipment, and small-scale household-level equipment, particularly for women using harvesting and processing equipment.

VI. Recommendation

16. I recommend that the Executive Board approve the proposed grant in terms of the following resolution:

RESOLVED: that the Fund, in order to finance, in part, the Use of Genetic Diversity and Evolutionary Plant Breeding for Enhanced Farmer Resilience to Climate Change, Sustainable Crop Productivity and Nutrition under Rainfed Conditions, shall provide a grant of three million five hundred thousand United States dollars (US\$3,500,000) to Bioversity International for a four-year period upon such terms and conditions as shall be substantially in accordance with the terms and conditions presented to the Executive Board herein.

Gilbert F. Hougbo
President

Results-based logical framework

Objectives-hierarchy	Objectively verifiable indicators	Means of verification	Assumptions
Goal: To sustainably increase crop productivity and enhance the resilience to climate change of farming communities under low-input, rainfed and less-favoured production conditions and organic production systems.	<ul style="list-style-type: none"> 72,000 poor smallholder farmers (at least 50% women), in target countries will have enhanced capacity to manage EPs for enhance productivity and quality of their local food and feed crops. 300 local entrepreneurs across the six countries, (at least 70% youth and 50% women), engaged in small business enterprises that sell high quality processed foods from EPs or for EP seeds multiplication 	<p>National Reports including farm-level profiling at baseline and final year of project</p> <p>Final Evaluation Report</p>	Countries maintain economic and political stability and remain committed to the use of evolutionary populations to improve agricultural production systems resilience under climate change
Objectives: The resilience of target low-input poor farmers in the project area is enhanced through developing evolutionary populations (EP) with higher and stable yields under the local farm agronomic and stress conditions, including drought, salinity, pest and diseases.	<ul style="list-style-type: none"> 30% of male and female target farmers in the project sites integrated a wide range of genetic resources in seed mixtures of EPs to cope with stress conditions At least one agricultural extension or development agency per country recommends EPs to cope with stress environments. 	Report of household surveys, coupled with farm-level profiling at baseline and final year of project	<p>Willingness of partners and communities to participate</p> <p>Partners available for facilitating the baselines</p>
Outcome 1: A gender and age sensitive participatory toolkit is used jointly by farmers, researchers, breeders, development workers and extension to design evolutionary populations targeted towards improved production and resilience for poor farmers	<ul style="list-style-type: none"> 10% of farmers in target sites of six countries participate in the use of the diagnostic toolkit to assess the role of EPs in improving their livelihoods 	<p>National Reports</p> <p>Final Evaluation Report</p> <p>Toolkit documentation</p>	<p>Willingness of partners and communities to participate</p> <p>Key stakeholders available for priority setting exercise</p>
Output 1: A gender and age sensitive participatory toolkit for priority trait setting with farmers for evolutionary breeding developed	<ul style="list-style-type: none"> A global toolkit developed and translated to institutional languages of the six countries 	Toolkit documentation	Willingness of partners and communities to participate
Outcome 2: Women and men farmers have the capacity and receive the necessary institutional support, to access, maintain and increase their income from the use of evolutionary population that increase productive gains while at the same time maintaining yield stability and ecosystem resilience under changing climate conditions.	<ul style="list-style-type: none"> 6,000 smallholder farmers are trained and have adopted EPs for their major food and feed crops (at least 50% women) 10% increase in farmers net income in the project sites from the adoption of EPs EB practices substitute for the cost/use of agrochemical for at least 20% of the project sites 	<p>Project reports with records of training participation</p> <p>Progress reports</p> <p>User surveys and interviews</p>	Farmers see the benefit and value of evolutionary populations, hence will be interested in sustainably managing them
Output 2a: Evolutionary populations are developed and enhanced with of a wide range of genetic resources from genebanks, community seed banks and on farm sources.	<ul style="list-style-type: none"> At least one farmer management system/crop/site that enable and affect ecological and evolutionary processes are documented and made available to breeders and seed suppliers 120 local and national extension service providers trained in the EPB process 120 researchers (at least 50% women) working on genetic 	<p>Project reports</p> <p>Progress reports</p> <p>User surveys and interviews</p>	<p>Partner organizations willing to cooperate</p> <p>National genebanks, Ministry of Agriculture and other agencies support distribution of materials</p> <p>Local famers have an interest in</p>

Objectives-hierarchy	Objectively verifiable indicators	Means of verification	Assumptions
	resources and breeding are trained in decentralized breeding approaches.		local varieties with relevant traits
Output 2b: Seed suppliers are diversified and farmers and farmers' groups integrated into seed value chains for the provision of EP seeds	<ul style="list-style-type: none"> At least two national seed production and supplier actors per country have increased capacity to promote locally adapted EP seed mixtures At least two farmer researcher collaborative groups per country are involved in seed multiplication and dissemination at local level 	Technical reports Project annual progress reports Project progress report	Partner organizations are willing to cooperate
Outcome 3: Results from cost-benefit analyses and cost-efficiency analysis, which include nutritional and environmental value assessment, are used by communities, genebanks, breeders, researchers, extension, seed producers and market chain actors to promote use of EP products and seeds	<ul style="list-style-type: none"> At least two profitable crop populations, seeds, and products (processing technologies etc.) from EP identified and made available for seed producers and market chain actors 300 local entrepreneurs across the six countries (at least 70% youth and 50% women), are engaged in small business enterprises that sell high quality processed foods from EPs or for EP seeds multiplication 	Technical reports Project annual progress reports Project progress report Interviews	Suitable varieties and processing technologies are available in market at reasonable price for adoption by private business or communities Perverse incentives are not present or can be removed
Output 3: CBA and CEA with comparative studies on EPB vs conventional breeding and accompanying seed supply systems are undertaken	<ul style="list-style-type: none"> Six cost-benefit comparative analysis undertaken (one per country) 	Scientific articles in peer reviewed journals Student theses	
Outcome 4: Policy options to support the promotion, access and benefit sharing of evolutionary breeding populations are identified and made available to local and national decision makers	<ul style="list-style-type: none"> At least five benefit sharing mechanisms* where communities gain from the maintenance and use of EB developed and adopted by farmer communities and national programmes 	Baseline surveys Progress reports/ Government reports/ Other agency reports National plans and strategies	Policymakers are open to changes in current seed laws Key relevant national sectors are willing to cooperate
Output 4: Actions and recommendations that support the adoption of good practices and policies on access and benefit-sharing are developed	<ul style="list-style-type: none"> At least two recommendations for re-aligning policies to support diversification of seed suppliers of planting materials 60 policy and decision makers have been invited to participate in awareness-raising and South-South cooperation events 	Progress reports Government reports	Policymakers are open to changes in current seed laws Key relevant national sectors are willing to cooperate

* True benefit-sharing involves developing mechanisms that support communities and their farming systems and thus agricultural techniques that conserve local agricultural biodiversity. Farmers' Rights imply the development of some means of ensuring benefits flow to farmers and farming communities either through an ownership approach or a stewardship approach. The ownership approach refers to the right of farmers to be rewarded for genetic material obtained from their fields and used in commercial varieties and/or protected through intellectual property rights. The stewardship approach refers to the rights that farmers must be granted in order to enable them to continue as stewards and as innovators of agro-biodiversity. In this context, creating incentives and removing disincentives to enable farmers to continue their work as stewards and innovators of agricultural biodiversity will be a key part of any benefit-sharing mechanism related to the maintenance of EP.