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International Treaty on Plant Genetic Resources for Food and Agriculture

INTERNATIONAL TREATY ON PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE

SEVENTH MEETING OF THE STANDING COMMITTEE ON THE FUNDING STRATEGY AND RESOURCE MOBILIZATION

3 – 5 May 2023

INTEGRATION OF PGRFA IN NATIONAL DEVELOPMENT PLANS, BUDGETS AND PRIORITIES FOR DONOR SUPPORT AND EXTERNAL FUNDING

Executive Summary

The Treaty's Funding Strategy calls on Contracting Parties to enhance integration of PGRFA in national development plans, national budgets and priorities for donor support and external funding (paragraph 29a). It requests Contracting Parties to share information about the results of such integration with the Secretariat and the Secretariat to use this information to develop strategic tools that National Focal Points and others can use to leverage new resources (paragraph 29b).

In order to take this forward, the Committee established a milestone for tools and best practices to be compiled by the Secretariat for better integrating PGRFA into national development plans (e.g. SDG plans, climate change, etc.) under *Focus Area 1: Resource Mobilisation* of the Operational Plan for the Funding Strategy 2020-2025.

As part of this process, at the Committee's sixth meeting, the Secretariat provided a preview on the work it has undertaken to collect and analyse information on the integration of PGRFA in national plans, budgets and priorities. This document contains the report on the first phase analysis undertaken.

The Funding Committee is invited to take note of the document and provide further guidance to the Secretary in taking forward the work in this area.

Contents

A. INTRODUCTION

1. Through Resolution 3/2019, the Governing Body of the International Treaty on Plant Genetic Resources for Food and Agriculture (hereinafter 'the Treaty') adopted the Funding Strategy of the Treaty for the period 2020 to 2025, as contained in Annex 1 to the Resolution. The Funding Strategy aims to ensure that sufficient financial resources are mobilized through a range of channels in a long-term, coordinated and effective way, including at the national level, where the implementation of the Treaty is key.

2. In order to take the implementation of the new Funding Strategy forward, the Funding Committee developed and implemented an Operational Plan for the Funding Strategy 2020–2025 (the Operational Plan), as foreseen in paragraph 44 of the Funding Strategy 2020–2025. This report responds to one of the milestones of the Operational Plan, which is to enhance the integration of plant genetic resources for food and agriculture (PGRFA) in national development plans, budgets and priorities. In particular, the report aims to provide an overview of whether and how PGRFA are being integrated in national climate change adaptation and other national development plans, policies and strategies, to ultimately, contribute to compiling tools and best practices for better integrating PGRFA into national development plans.

3. A recent development of particular importance for this report is a scoping study published in 2022 by the Food and Agriculture Organization of the United Nations (FAO) on the role of genetic resources for food and agriculture in adaptation to and mitigation of climate change.[1] It is based on, among other things, scientific literature and reports by FAO and other international organizations, as well as on nationally determined contributions (NDCs), and its main focus is the state of current use of genetic resources in climate change adaptation and mitigation efforts.

B. METHODOLOGY

4. The report is based on two different exercises. The first, was an analysis of the National Adaptation Programmes of Action (NAPAs), the National Adaptation Plans (NAPs), and the National Determined Contributions (NDCs) that had been developed by 27 Least Developed Countries (LDCs) and developing countries as of 31 January 2022.[2] While reviewing these documents, special attention was given to identifying whether these policy documents included objectives or prioritized activities related to the promotion, conservation and sustainable use of PGRFA.

5. Based on this broad analysis, in a second step, particular countries were identified that had largely integrated PGRFA in adaptation activities that may be potential sources for developing tools and best practices (9 countries). Further analysis was undertaken on a broader set of national policies, strategies and plans for this smaller sub-set of countries.

6. The analysis of the NAPAs,[3] NAPs and NDCs led to the identification of a number of keywords. Examples of these include: agrobiodiversity, indigenous, local, and underutilised plant varieties or landraces, crop diversification, intercropping, *in situ* and *ex situ* conservation of PGRFA, gene banks, kitchen and home gardens, promotion or development of stress tolerant or high yielding varieties, breeding, and traditional knowledge. These keywords, and the activities that contained them, were then synthesized and grouped together. The identified keywords/activities were grouped based on the Provisionally Populated Matrix of Funding Tools, contained in the Appendix to the Terms of Reference of the Standing Committee on the Funding Strategy and Resource Mobilization, contained in Annex 2 to Resolution 3/2019. As a result, the activities were organized into the 10 groups that appears on the Matrix: 1) *Ex situ* conservation; 2) *In situ* conservation; 3) On-farm management; 4) Sustainable use and breeding; 5) Technology transfer; 6) Capacity building; 7) the Treaty's Multilateral system on access and benefit sharing; 8) the Treaty's Global Information System and other information systems; 9) Farmers' Rights, and 10) Policy development. It is

[1] doi.org/10.4060/cb9570en
[2] www4.unfccc.int/sites/NAPC/Pages/national-adaptation-plans.aspx
[3] The integration of PGRFA into the NAPAs had been previously studied in Bedmar Villanueva, A., Halewood, M., & López Noriega, I. (2017). Agricultural biodiversity in climate change adaptation planning. *European Journal of Sustainable Development*, *6*(2), 1-1.

important to note that many priority activities relate and are relevant to more than one group, therefore, the grouping of activities was just intended to simplify the analysis of the policy documents.

7. The analysis arising from the first exercise made it possible to assess whether and how countries are integrating PGRFA as part of their climate change adaptation strategies developed under the umbrella of the United Nations Framework Convention on Climate Change (UNFCCC). Given that the aim of the study was also to assess the integration of PGRFA into other national plans, policies and strategies, the analysis was also used to identify the countries that could potentially be of interest in carrying out the second exercise.

8. Based on such criteria, Kiribati, Malawi, Myanmar, Peru, Saint Lucia and Sri Lanka were selected to be studied further as they had largely integrated PGRFA among their prioritized adaptation activities. Furthermore, additional countries that had participated in two relevant FAO programmes: the 'Integrating Agriculture into National Adaptation Plans' (NAP-Ag) programme,[4] and/or in the so called 'Scaling up Climate Ambition on Land Use and Agriculture' through NDCs and NAPs (SCALA)[5] were included in the study. The inclusion of these additional countries (i.e. Cambodia, Kenya and Nepal) was made on the assumption that their participation in such programmes implied the recognition of the importance of the agricultural sector for their development.

9. The Faolex database was used to identify the national plans, policies and strategies of potential interest for this study of the selected countries. Specifically, the search focused on plans, policies and strategies related to agriculture, food security and nutrition, environment, development, and climate change. The plans, policies and strategies that were found to include activities related to the promotion, conservation and sustainable use of PGRFA for each country are shown in Table 1. The National Biodiversity Strategy and Action Plans (NBSAPs) of these countries were also reviewed. The same procedure followed to analyse the NAPAs, NAPs and NDCs was applied for reviewing the identified policy documents: the previously identified keywords, and the activities that contained them, were then synthesized, grouped, and entered into tables (one for country). In analysing these documents, a number of new keywords/activities were identified and added to the tables. A compilation of some of the activities identified in the policy documents analysed is contained in the annex of this report.

C. KEY FINDINGS

10. The exercise of synthesizing the activities related to PGRFA identified in the analysed policy documents resulted in a list of a total of 40 activities of interest for this study. Following the structure of the Matrix of Funding Tools, of the 40 activities, two fell within the section related to *ex situ* conservation, four within that related to *in situ* conservation; 11 to on-farm management, 13 to sustainable use and breeding, one to technology transfer, two to capacity building, one to the Treaty's Multilateral system on access and benefit sharing, one to the Treaty's Global Information System and other information systems, two to Farmers' Rights, and three to policy development. In summary, 60% of the identified activities were related to on-farm management and to the sustainable use and breeding of PGRFA. Examples of PGRFA related activities contained in the policy documents analysed are provided in Annex 1 of this document.

PGRFA integration into national adaptation planning under NAPAs, NAPs and NDCs

11. Overall, most of the NAPAs and the studied NAPs contained prioritized activities related to the conservation and sustainable use of PGRFA, while the analysed NDCs were not found to be particularly interesting for the purpose of this report, given that, often, in the section focused on the countries' climate change adaptation efforts, countries just refer to their NAP. However, the activities related to PGRFA included in the studied NDCs that included enough details are primarily related to the 'promotion of improved stress tolerant varieties'.

12. The number of activities related to the conservation and sustainable use of PGRFA for climate change adaptation was, generally, much broader in the studied NAPs than in the NAPAs. Whereas the

[4] www.adaptation-undp.org/naps-agriculture/overview
[5] www.adaptation-undp.org/scala

analysis of the NAPAs led to the identification of 12 PGRFA-related activities, in the case of the NAPs, there were 22. The NAPAs were established in 2001, by the Conference of the Parties of the UNFCCC as a tool for LDCs to identify priority activities that responded to their urgent and immediate adaptation needs, whereas the NAPs were conceived in 2010 as a means for countries to identify medium- and long-term adaptation needs. The greater integration of PGRFA in the studied NAPs compared to the NAPAs found in this study might be a consequence of the important efforts made at the international level during the last few years to increase awareness of the role of the genetic resources for food and agriculture in the adaptation of the food systems to climate change.

13. The activities related to PGRFA that appear most frequently in the 50 analysed NAPAs are the 'promotion of improved stress tolerant varieties', 'promotion of early/short-cycle varieties' and 'promotion of kitchen/home gardens', followed by 'crop diversification' and 'promotion of horticulture, fruit trees and other cash crops'. These five activities constitute the 87% of the PGRFA-related activities identified in these documents. Despite the widespread recognition of the importance of local varieties, landraces and neglected and underutilized species for climate change adaptation and for ensuring food security, only three countries included in their NAPA priority activities related to the 'protection or promotion of indigenous/local/underutilised varieties/landraces'.

14. In general, a good number of the identified activities contained in the NAPs are related to research and development of stress tolerant or more resilient varieties. The activity related to PGRFA that appears in a greater number of the studied NAPs is 'the promotion of improved stress tolerant/high yielding varieties', followed by, in order, 'crop diversification' and 'breeding climate resilient/stress tolerant crop varieties', and 'enhance capacity of agricultural research institutions (breeding, collection, documentation)'. In contrast to the NAPAs, a good number of NAPs include activities aiming at the 'promotion of traditional knowledge' and to the 'protection/promotion of indigenous/local/underutilised varieties/landraces'.

15. Although the availability of data and information on biodiversity-related issues are critical for establishing baselines, quantifying benefits, and monitoring its level of conservation over time, only a limited number of the studied NAPs, and none of the NAPAs, include initiatives related to the 'registration of agrobiodiversity'. Similarly, no NAPA and a very few of the studied NAPs include prioritized activities related to the marketing and consumption ends for the products of agricultural biodiversity. In addition, none of the 50 NAPAs nor the 22 studied NAPs mention the international agreements for the conservation and exchange of PGRFA such as the Convention on Biological Diversity's Nagoya Protocol on Access and Benefit Sharing and the International Treaty, despite the role that these two international mechanisms might have in the context of climate change. None contains activities related to technology transfer, capacity building, or information systems related to PGRFA.

PGRFA integration into other national plans, policies and strategies

16. A total of 105 policy documents of interest for this study were identified across the nine selected countries. Of these, 31 were climate change policies or strategies, 30 were related to the agricultural sector, 22 to food security and nutrition, 17 were development plans and five were related to the environment.

17. The activities that appeared more often in the analysed policy documents were the following: 'Protection/promotion of indigenous/local/underutilised varieties/landraces', which appear in 51 documents, followed by 'promotion of improved stress tolerant/high yielding varieties', 'breeding climate resilient/stress tolerant crop varieties' and 'crop diversification', which appear in 46 documents each, 'gene banks/*ex situ* conservation', and 'enhance capacity of seed/agricultural research institutions (breeding, collection, documentation)', which appear in 39 documents, and 'enhance value chain/competitiveness and markets access to smallholders' products, which appear in 37 documents.

18. Overall, 70% of the PGRFA-related activities included in the analysed policy documents fall within the on-farm management and the sustainable use and breeding groups. These documents also include activities related to *ex situ* and *in situ* conservation of PGRFA, but these activities only represent, respectively, the 10% and 7% of the activities included in the studied documents. The PGRFA-related activities classified in the groups related to technology transfer, capacity building, the Treaty's Multilateral

System on Access and Benefit-sharing (or access and benefit-sharing in general), Farmers' Rights or policy development appear less often and in a more limited number of the policy documents studied.

D. CONCLUSIONS AND SUGGESTED WAY FORWARD

19. Based on the findings of this study, the countries selected are integrating PGRFA in a number of plans, policies and strategies related to agriculture, food security and nutrition, environment, national development, and climate change adaptation. This integration is taking place, especially, through the promotion of activities related to on-farm management of PGRFA (i.e., activities that seek to promote the diversification of the crop production systems) and to sustainable use and breeding. While this is a positive finding, this study also shows that additional efforts could be made for countries to include more activities related to capacity building, technology transfer, information systems on PGRFA and facilitating access to PGRFA in their national plans and policies.

20. In practice, lack of human capacity, sustainable financing, technical resources and poor coordination between government departments may hinder countries' capacity to implement their strategies and policies. Consequently, national objectives, priority activities or initiatives identified in plans, policies and/or strategies do not always necessarily translate into activities in the ground.

21. The next steps will be to identify a selection of countries to consider engaging with where there are potential opportunities for linking and learning with regard to plant genetic resources for food and agriculture integration in national planning. The aim is to identify whether and how the identified PGRFA related policies or plans are implemented in practice, and what the gaps, enabling levers, and bottlenecks are; as well as to understand what the national budget setting processes are for PGRFA activities/policies.

22. This could be conducted through the examination of additional national documents, such as the national reports to the Treaty' Secretariat and to the FAO's Commission on Genetic Resources for Food and Agriculture, through the organisation of interviews with relevant experts from the selected countries, or even organizing a consultation with a network of partners from the studied countries that have successfully integrated PGRFA into national plans and policies. All these may contribute to identifying best practices and to developing tools for better integrating PGRFA into national plans, policies and strategies and their effective implementation; to better understand whether and how policy has translated into practice, and what the gaps, enabling levers, and bottlenecks are; and to understand what the national budget setting processes are for PGRFA activities/policies, if there are sufficient funds allocated /spent, and where the entry points are for ensuring appropriate funding allocation.

23. In doing so, analysis of opportunities arising from the adoption of the post-2020 Global Biodiversity Framework for the integration of plant genetic resources in National Biodiversity Strategies and Action Plans (NBSAPs) would also be undertaken.

Annex 1

Examples of PGRFA related activities contained in the policy documents analysed organized using the ten thematic groups of the Provisionally Populated Matrix of Funding Tools of the Funding Strategy

PGRFA CONSERVATION AND SUSTAINABLE USE

Ex situ

- Promotion of partnerships with relevant public and private institutions to increase funding for germplasm conservation and to protect plant varieties with potential for commercial value.
- Promote and support conservation and propagation of germplasm of species with adaptive capacity, which involves the establishment of in-situ and ex-situ genetic resources conservation areas/centres, the identification of crop species that are adaptive and tolerant to adverse weather conditions, breeding, multiplication, and field trials and demonstrations.
- Expand existing facilities and establish new ones (seed banks, gene banks, botanical gardens, etc.) at the local, provincial and national level for maintaining, evaluating, documenting and the distribution of germplasm. Maintain genetic materials in ways that will preserve viability and genetic stability over long periods of time and evaluate them regularly. Support collections and exploration for the collection of wild relatives with emphasis on threatened genetic resources. Consider opportunity of placing some accession-trust with FAO so that they can be maintained at international standards.
- Procure equipment for, conduct capacity-building initiatives on, and develop guidelines for collection, characterization and conservation of germplasm.
- Inventory gene and seed banks existing in the country and in the region.
- Collect the wild relatives of plant genetic resources, including in particular landraces on the verge of extinction, and related scientific information, including traditional knowledge, with the consent of local communities and indigenous ethnic minorities, in accordance with national legislation and policies.
- Conduct gap analysis to identify germplasm collection gaps and inform *ex situ* conservation priorities and strategies.
- Characterize and classify the genetic diversity of cultivated plants and their wild relatives for morphological and agronomic traits, including at the molecular level, if possible.
- Carry out molecular genetics research to identify and use beneficial genes of wild relatives and traditional varieties with the aim of improving cultivated crop varieties.
- Improve the capacity and facilities of the seed and molecular biology laboratories in order to enhance *ex situ* conservation research capacity and add value to germplasm.
- Training and capacity building in taxonomy seed technology; application of molecular markers in germplasm characterization, evaluation and genetic diversity studies.

In situ

- Develop research priorities and enhance research capacities to increase productivity and profitability of agrobiodiversity.
- Update land use maps and management plans for biodiversity conservation sites.
- Conduct scientific studies on the effects of climate change on genetic resources conserved *in situ* in order to assess the level and extent of threat of genetic erosion and to inform the development of mitigation strategies.
- Establish a system for registering agro-biodiversity and for periodically monitoring the trend of changes in the status of agrobiodiversity.
- Conduct collaborative research with universities, farmers' groups, and civil society to identify national centres of crop wild relatives' diversity.
- Create new protected areas or special management zones within existing protected areas for in-situ conservation of crop wild relatives.
- Establish *in situ* conservation and management of wild relatives and wild food plants to ensure continued and long-term availability of their germplasm under changing climatic conditions.
- Conduct research on genetic variation of domesticated wild plants.
- Conservation, promotion and sustainable use of agricultural biodiversity through the establishment of programmes and budget for climate adaptation and resilient technologies to enhance farmers' capacity to cope with climate change.
- Germplasm protocols and criteria to select, identify and conserve underutilised, hardy and native crop species.
- Manage and conserve the diversity of native, naturalized and domesticated crops, through their characterization, evaluation, documentation and enhancement.
- Ensure the conservation of the diversity and variability of native and naturalized plants and their wild relatives, through *ex situ* conservation in germplasm banks and *in situ* in farmers' fields.

On farm management

- Establish and enhance on-farm conservation of genetic resources to ensure continued availability of traditional farmer varieties for broadening of genetic base and increasing resilience of agricultural production systems.
- Empower communities, through capacity strengthening initiatives, for on farm conservation and sustainable utilization of agro-biodiversity.
- Promote agricultural practices that encourage diversified crop and other food production practices.
- Initiate and diversify income generation activities by increasing agricultural production of indigenous/traditional crops, and providing credit access to rural traditional farmers.
- Re-introduce and propagate lost species from gene banks and other sources and revive cultivation of abandoned traditional/indigenous crops in view of their rich nutritious values.

- Enhanced financial and technical support for the re-introduction of indigenous and more drought tolerant food crops like cassava, millet, sorghum, and sweet potatoes into the farming systems.
- Promote production of traditional crops and of indigenous fruits and vegetables that can facilitate food access and food security over time.
- Evaluation and promoting cultivation of special traditional varieties with natural tolerance for deep-water, prolonged flooding, or drought.
- Improve farmers' access to quality seeds and planting materials of drought tolerant traditional high value crops through upscaling seed bulking and distribution in identified institutions and farmer groups.
- Crop and diet diversification through the cultivation of roots and tubers (cassava, sweet potatoes) and other drought tolerant crop cultivars.
- Introduce diversified and improved crop varieties (high yielding, short duration, disease and pest tolerant, high nutritive value, flood tolerant), including indigenous varieties.
- Promote the production of high value and nutritious legumes, drought-resistant crops, and horticultural crops.
- Support communities to produce indigenous, high nutritive value foods through provision of small loans, promotion of backyard gardens and planting of fruit trees both during wet and dry season.
- Increase horticultural crop productivity and production for local demand and export through improving research and development on horticultural production techniques with providing high yield, resistant to pest composition, and climate change adaptation.
- Improve cropping sequences for short term crops in collaboration with farmer networks.
- Promoting economic diversification among pastoral communities (e.g. cultivation of drought-tolerant crops such as millet).
- Provide incentives to farmers to diversify their crop production and utilisation: Design appropriate extension messages on diversification of agro-based enterprise production with an emphasis on oilseeds, horticulture; Provide tax and non-tax incentives for production of crops, especially oilseeds, horticulture, livestock, and fisheries; Strengthen smallholder engagement in indigenous agro-based enterprises, etc.

Sustainable use and breeding

- Provision of a sustainable financing system for research and development, germplasm conservation, extension, quality control and capacity building to fully exploit the potential of improved varieties and technologies for increased agricultural productivity.
- Research coordination activities, including establishment of research Programs at research station level; national plant breeder's fairs, and coordination meetings amongst public, private and CGIAR research institutions.
- Develop national genepool-specific networks comprising a wide range of specialists including breeders, conservationists, agronomists, farmers, pathologists, and seed technologists.
- Enhance the capacity of public research institutions through increased funding, and encourage local breeders to undertake breeding through partnerships and collaboration with regional and international research institutions.

- Continue to support public breeding institutions to maintain varieties and produce seed of those varieties not attractive to the private sector.
- Establishing and strengthening functional linkage between the National Agriculture Genetic Resources Center (Gene Bank) and community based seed or gene banks.
- Establish community gene banks for conservation of farmer preferred varieties in different agro-ecological zones.
- Promoting community based seed production and agro-biodiversity in inaccessible remote areas and for crops that are not attractive for private sector to produce seed.
- Introduction of a community based seed production programme and establishment of a storage method.
- Organise communities to collect and multiply seeds for indigenous foods and provide the initial start up seeds as may be required.
- Organise communities to establish a revolving seed fund for indigenous vegetables, other fruits and vegetables, high nutritive value foods to loan to the community members.
- Conduct collaborative research between and farmer organisations, extension agents, and farmer field schools for documentation and breeding of traditional crop varieties.
- Establish experimental stations and seed farms for the development of varieties suitable to the agro-climatic conditions of the area and markets that will provide greatest value added to scheduled crops.
- Encourage breeders to continue sourcing and developing variable germplasm to broaden the genetic base of various crops and plant species, and support domestication and conservation of biodiversity.
- Intensify research on new seed varieties, commercialise already improved varieties, and working with farmers to develop farm-level selection methods to improve their own varieties.
- Breeding and screening climate-resilient varieties for early maturity, tolerance to drought, submergence and salt; limited as well as excessive moisture; low glyceamic index; and high carbon sequestration.
- Varietal screening, in collaboration with producer co-operatives through Public-Private Partnerships, to explore high yielding varieties best suited for specific climatic conditions.
- Enhance participatory breeding and field demonstration for farmer preferred and climate change adaptive traits.
- Promote the use of crop genetic resources through the linkage with plant breeding and *in situ* biodiversity conservation programmes.
- Commercialization and development of indigenous crops, which may be better adapted to the areas that are at risk to climatic issues.
- Identify niche markets to promote products originated from traditional germplasm.
- Support cooperatives, out-grower schemes and fair-trade initiatives to increase the share of small producers in the production and export of high value crops.
- Promote processing of and adding value to selected crops, fruits, nuts, and other products that are resilient to the impacts of climate change.

- Establish partnerships with food processing companies to improve local production of complementary foods.
- Promote sustainable production of local, safe and nutritious foods by providing incentives for their production by small-scale and other producers: Identification of the supply of selected priority commodities and linking food producers and suppliers to markets; adoption of the value chain approach for selected commodities, with participation of all actors along the value chain, and facilitating dialogue among all relevant stakeholders.
- Establishment of a unit needs in the Agriculture and Livestock Division to coordinate and manage the value chain development program in partnership with donors, the private sector and farmers.
- Improving production and marketing of selected crops while supporting farmers to venture into other enterprises to improve their livelihoods. Promotion of the selected crops through international trade fairs in order to reclaim lost markets and open new ones. Support trade in the domestic market through removal of restrictions and awareness creation among the public on the status of the crop.
- Support capacity strengthening of smallholder farmer organizations and small and medium enterprises to enhance production, processing and distribution of food and agricultural products to schools.
- Establishment of demonstration gardens in strategic places such as schools, churchyards, and public lands.
- Diversify and broaden genetic food base (species/varieties that are tolerant to atoll environment and projected impacts of climate change: high salinity, prolonged drought, brackish water).

Technology transfer

- Technology development, dissemination and adoption along crops, livestock, fisheries and forestry value chains.
- Rehabilitation and building of infrastructures of state farms, research stations and agricultural development centers to serve for all forms of crop-related research & development and appropriate technology transfer activities.

TREATY ENABLING MECHANISMS & PROVISIONS

Capacity building

- Strengthen farmers' capacity to select, breed and maintain farmer preferred crop varieties.
- Empower communities through capacity strengthening initiatives for on farm conservation and sustainable utilisation of agrobiodiversity.
- Develop community awareness program and demonstration sites to promote climate-resilient crop production systems (taking into consideration traditional and contemporary knowledge and practices, such as agroforestry, drought/salinity-resilient crops, sustainable management practices).
- Carry out national awareness campaigns on the value of genetic resources directed at sensitizing traditional farmers, user community at large and policy makers, affected government ministries, and other stakeholders.
- Awareness raising campaigns on the benefits of agro-biodiversity: Development and publication of communication products and services to train farmers on agro-biodiversity practices and raise awareness of their benefits among value chain actors.

- Strengthen and improve the national agriculture extension program to better provide advice and services on crop selection, land preparation, seed selection, planting, crop growth, management, harvesting and sales storage and marketing/sales techniques.
- Organize training to trainers, law enforcement officials, community groups, NGOs, CSOs, private sector, media persons and other stakeholders at various levels on different aspects of biodiversity management, including on access to genetic resources and materials and equitable sharing of benefits.
- Produce and disseminate educational, training and awareness creation materials on genetic resources, including posters, pamphlets, brochures and audio-visuals.
- Develop appropriate genetic resources curricula for primary, secondary and tertiary educational institutions.
- Develop and disseminate information education and communication materials on indigenous high-nutrient value crops.
- Develop and strengthen relationships with the local media and encourage them to cover genetic resources issues on a regular basis, involve them in communications workshops and meetings to gain a better understanding of the subject area.
- National education, training and awareness program to induce a radical switch in consumer preferences in favour of the healthier consumption of local agricultural produce and food develop and disseminate recipes that use a variety of foods, with emphasis on indigenous foods, to diversify diets.
- Cooking demonstrations using local, indigenous and diversified ingredients.
- Liaise with the research and extension department to evaluate nutritional value of indigenous and local foods and develop recipes that promote use of the nutritious indigenous foods.
- Improve the availability of physical and economic access to, and the consumption of, diversified food groups, especially indigenous local food (cereals, legumes and oilseeds) and fruits and vegetables.

Multilateral System

- Encourage access of germplasm from international agriculture research centers by both public and private seed research institutions through transparent material transfer agreements and mutually agreed contracts between Contracting Parties.
- Review and simplify procedures and processes for access to genetic resources conserved *in situ*.
- Establishing one-door system for regulating the provisions, as mentioned in the international treaties, related to genetic resources (both plant and animal genetic resources).
- Facilitating implementation of the Standard Material Transfer Agreement (SMTA).
- Regulate access to the genetic resources of the country's cultivated or domestic species, promoting their preservation and sustainable use.

GLIS and other information systems

- Increase efforts on germplasm characterization and evaluation, including availability of data and germplasm repository catalogues, to catalyze technology and innovation generation.

- Establishment of an efficient system for exchange of information on all kinds of agricultural genetic resources and implementation of the Treaty and its multilateral system on access and benefit sharing.
- Develop mechanisms for the regular flow of information of the new varieties to farmers and provide regular feedback to research scientists.
- Strengthening the national clearing-house mechanism to handle data and information on PGRFA.
- Improve the research capability, quality, credibility and reach of extension advisory using Information and Communication Technologies: Plant genetic resource database; Global plan of action for plant genetic resources-information sharing mechanism; Information on climate smart technologies and climate resilient crops.
- Systematic database storage and dissemination of technical and scientific information on the country's genetic wealth, in order to contribute to decision-making for its conservation and sustainable use.

Farmers' Rights

- Identify, recognize and promote the rights of farmers.
- Implementing awareness programmes on documentation, use and promotion of indigenous and traditional knowledge for conservation and use of agrobiodiversity.
- Encourage integration of agrobiodiversity conservation and utilization in combination with associated indigenous knowledge systems and modern agricultural practices, technology and research.
- Identification, documentation of traditional knowledge and production of traditional knowledge registers for biodiversity resources used in traditional cuisine and food cultures.
- Document traditional knowledge, among men and women, of cultivation, preparation and preservation techniques for traditional food crops and fruit trees.
- Validate indigenous knowledge with a view to disseminate it for integration into conventional technologies.
- Collect, collate and document indigenous knowledge of economically important plant species as a basis of tapping their inherent economic potential.

Policy development

- Carry out a genetic resources stakeholder analysis in order to determine the diversity of institutions involved in genetic resources and hence ensure their adequate representation in the national institutional framework for genetic resources conservation and use.
- Develop a comprehensive, all-encompassing and harmonized policy and legal framework specifically for the conservation and sustainable utilization of genetic resources.
- Examine and adapt the existing legislation on the protection of forests and wildlife for possible use of *in situ* conservation of genetic resources especially the wild crop relatives.

- Develop policies for institutionalizing of the national strategy on genetic resources conservation including provision of financial and human resources for its implementation.
- Domesticate international instruments that govern the conservation and utilisation of agrobiodiversity.
- Use agricultural subsidies to promote zoning and crop diversification.
- Review plans and strategies that are in place to maintain the genetic diversity for food and agriculture and genetic diversity of other planted species in-situ and ex-situ.
- Develop and implement plans and policies for ex-situ and in-situ conservation, and for the distribution of germplasm (seed, tissues etc.)
- Facilitate the development of local plan and policies in breeding better and climate resilient varieties.
- Devise plans and policies to protect farmers' rights in specific geographical domain.
- Establish a farmers' Commission to develop mechanisms that promote farmers' rights in the Agriculture Development Strategy.

Annex 2

National plans, policies and strategies of the countries studied that integrate PGRFA

Policy documents	Selected countries								
	Cambodia	Kenya	Kiribati	Malawi	Myanmar	Nepal	Peru	Saint Lucia	Sri Lanka
National Adaptation Programmes of Action (NAPAs)	NAPA (2006)	-	NAPA (2007)	NAPA (2006)	NAPA (2012)	NAPA (2010)	-	-	-
National Adaptation Plans (NAPs)	-	Kenya National Adaptation Plan (2015-2030)	-	-	-	NAP (2021-2050)	Plan Nacional de Adaptación al Cambio Climático del Perú: Un insumo para la actualización de la Estrategia Nacional ante el Cambio Climático (2021)	National Adaptation Plan (2018-2028)	National Adaptation Plan for Climate Change Impacts in Sri Lanka (2016-2025)
National Determined Contributions (NDCs)	Cambodia's updated NDC (2020)	Kenya's updated NDC (2020)	Kiribati's First NDC (2016)	Malawi's updated NDC (2021)	Myanmar's First NDC (2021)	Second NDC (2020)	Contribuciones determinadas a nivel nacional del Perú. Reporte de actualización periodo (2021-2030)	Saint Lucia's updated NDC (2021) Saint Lucia' s NDC Financing Strategy (2021)	Sri Lanka's updated NDC (2021)
National Biodiversity Strategy and Action Plans (NBSAPs)	NBSAP (2016)	NBSAP (2000)	Second NBSAP (2016-2020)	Second NBSAP (2015-2025)	Second NBSAP (2015-2020)	Second NBSAP (2014-2020)	NBSAP v2: Estrategia Nacional de Diversidad al 2021. Plan de Acción 2014 - 2018	Revised Second NBSAP (2018-2025)	Second NBSAP (2016-2022)
Agriculture policies and strategies	Agricultural Sector Strategic Development Plan (2014-2018) Plan of Action for Disaster Risk Reduction in Agriculture (2014-2018)	Agriculture Sector Development Strategy (2010-2020) Agricultural sector transformation and growth strategy (2019-2029) National Agriculture Investment Plan (2019-2024) Kenya Agricultural & Livestock Research Organization Strategic Plan (2017-2021) Strategic Plan 2018-2022 for the Ministry	Kiribati Agriculture Strategy (2020-2030)	National Agriculture Policy (2016) National Seed Policy (2018) National Agricultural Investment Plan: Prioritised and Coordinated Agricultural Transformation Plan for Malawi: FY 2017/18-2022/23	Myanmar Second Short Term Five Year Agriculture Policies and Strategic Thrusts (2016-2021) (Agriculture Policy 2016) Agriculture Development Strategy and Investment Plan (2018-19-2022-23)	National Seed Vision (2013-2025) Agriculture Development Strategy (2015-2035)	Estrategia Nacional de Desarrollo Rural (2004) Política Nacional Agraria (2016) Plan Estratégico Sectorial Multianual del Ministerio de Agricultura (2012 – 2016) Plan Estratégico Sectorial Multianual del Ministerio de Agricultura y Riego (2015 – 2021) Estrategia Nacional de Agricultura Familiar (2015-2021)	National Agricultural Policy (2009-2015) Sectoral Adaptation Strategy and Action Plan for the Agriculture Sector (2018-2028) Portfolio of Project Concept Notes for the Agriculture Sector (2018-2028)	National Action Plan for Agrobiodiversity Conservation and Sustainable Utilization in Sri Lanka (2008) National Policy and Strategy on Cleaner Production for Agriculture Sector (2012) National Agriculture Policy (2021) Sri Lanka E-agriculture Strategy (2016-2018)

		of Agriculture, Livestock, Fisheries and Co-operatives National Seed Policy, June 2010 Crops Act, 2013 (No. 16 of 2013) National Horticulture Policy (2012)							
	Cambodia	Kenya	Kiribati	Malawi	Myanmar	Nepal	Peru	Saint Lucia	Sri Lanka
Food security and Nutrition policies and strategies	National Action Plan for the Zero Hunger Challenge (2016-2025)	National Food and Nutrition Security Policy (2011) National Food and Nutrition Security Policy Implementation Framework (2017-2022) The Kenya Nutrition Action Plan (2018–2022) The Kenya Nutrition Monitoring and Evaluation Framework (2018-2022) National School Meals and Nutrition Strategy (2017–2022)	National Nutrition Policy and Plan of Action (1997)	Malawi: Food Security Policy (2006) National Nutrition Policy (2013) National Resilience Strategy (2018-2030): Breaking the Cycle of Food Insecurity National Multi-Sector Nutrition Strategic Plan (2018–2022)	National Plan of Action for Food and Nutrition (2011-2015) Multi-sectoral National Plan of Action on Nutrition (2018/19 – 2022/23)	Nutrition Policy and Strategy (2004) Food and Nutrition Security Plan of Action of Nepal (2018) Nepal: Zero Hunger Challenge National Action Plan (2016-2025) Multi-sector Nutrition Plan (2018-2022)	Plan Nacional de Seguridad Alimentaria y Nutricional (2015-2021)	National Food Production Action Plan (2013-2016) Food and Nutrition Security Policy and Action Plan (2014-2024)	National Nutrition Policy of Sri Lanka (2010) Food Production National Programme (2016-2018)
Environment policies and strategies	-	-	Kiribati Integrated Environment Policy (2012)	National Environmental Policy (2004)			Plan Nacional de Acción Ambiental (2011-2021) Política Nacional del Ambiente al 2030 (2021)	National Environment Policy and National Environmental Management Strategy for Saint Lucia (2004)	
	Cambodia	Kenya	Kiribati	Malawi	Myanmar	Nepal	Peru	Saint Lucia	Sri Lanka
National development plans	Rectangular Strategy IV (2018) National Strategic Development Plan Update (2009-2013) National Strategic Development Plan (2014-2018)	Kenya Vision 2030. A Globally Competitive and Prosperous Kenya (2007) Big Four Agenda: Third medium term plan (2018-2022)	Kiribati Development Plan (2016-2019)	Malawi National Strategy for Sustainable Development (2004) The Malawi Growth and Development Strategy III (2017) Malawi 2063 – Malawi's Vision: An Inclusively Wealthy and Self-reliant Nation (2020)	National Sustainable Development Strategy for Myanmar (2009) Myanmar Sustainable Development Plan (2018-2030) Rural Development Strategic Framework (2014)	The Fifteenth Plan (Fiscal Year 2019/20-2023/24) Post Disaster Recovery Framework (2016-2020)	Plan Estratégico de Desarrollo Nacional: Plan bicentenario: El Perú hacia el 2021		Regaining Sri Lanka: Vision and Strategy for Accelerated Development (2002) Vision 2025 (A Country Enriched)

Climate change policies and strategies	Cambodia Climate Change Strategic Plan (2014-2023) Climate Change Priorities Action Plan for Agriculture, Forestry and Fisheries Sector (2014-2018) Climate Action Plan of Ministry of Environment (2016-2018) Climate Change Financing Framework (2015) National Adaptation Plan Financing Framework and Implementation Plan (2017)	National Policy on Climate Finance (2016) National Climate Change Response Strategy (2010) National Climate Change Action Plan (2013-2017) National Climate Change Action Plan (2018-2022) Climate Smart Agriculture Strategy (2017-2026) Climate Smart Agriculture Implementation Framework (2018-2027) Kenya National Strategy on Genetic Resources within the Context of Climate Change (2016–2020)	Kiribati Joint Implementation Plan for Climate Change and Disaster Risk Management (2014-2023) Kiribati Climate Change Policy (2018)	National Climate Change Management Policy (2016) National Climate Change Investment Plan (2013-2018) National Resilience Strategy (2018-2030) National Disaster Recovery Framework (2017)	Climate-Smart Agriculture Strategy (2015) Climate Change Strategy and Action Plan (2016–2030) Myanmar Climate Change Master Plan (2018-2030) Myanmar Action Plan on Disaster Risk Reduction (2017)	National Climate Change Policy (2019) Climate Change Adaptation and Disaster Risk Management in Agriculture (2011-2020)	Estrategia Nacional Cambio Climático (2015) Plan de Acción de Adaptación y Mitigación frente al Cambio Climático (2010) Plan de Gestión de Riesgos y Adaptación al Cambio Climático en el Sector Agrario (2012-2021)	Climate Change Research Strategy (2020-2030) Climate Change Adaptation Policy (2013-2022)	National Climate Change Adaptation Strategy for Sri Lanka 2011-2016 National Climate Change Policy (2012)