

SYNTHETIC ACCOUNT OF THE SECOND GLOBAL PLAN OF ACTION FOR PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE



COMMISSION ON
GENETIC RESOURCES
FOR FOOD AND
AGRICULTURE



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FOR PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE**

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Introduction

Plant genetic resources for food and agriculture (PGRFA) embrace the diversity within and between crops and their wild relatives. This diversity has evolved over thousands of years in a dynamic interaction between nature and agriculture. Plant genetic resources provide the biological basis of world food production and security and hence contribute to economic development. By serving as building blocks for farmers and breeders to develop new plant varieties, PGRFA are an insurance for agriculture to overcome future challenges, such as climate and other environmental changes and increasing food demand.

The FAO Commission on Genetic Resources for Food and Agriculture (the Commission) was established in 1983 as a forum to deal specifically with issues related to PGRFA. In 1995, its mandate was broadened to cover all genetic resources for food and agriculture. In the 1990s, the Commission guided FAO in the first ever assessment of the *State of the World's Plant Genetic Resources for Food and Agriculture*, and led negotiations that culminated in 1996, when 150 countries adopted the rolling Global Plan of Action for the Conservation and Sustainable Utilization of Plant Genetic Resources for Food and Agriculture. As the first framework to succeed in integrating conservation and utilization activities, the Global Plan of Action also recognized the crucial

roles played by farmers, seed curators and breeders in managing these resources.

The Commission, at that time, agreed that FAO should periodically re-assess the state of the world's PGRFA to facilitate the analysis of changing needs and gaps, and to contribute to the adjustment of the Global Plan of Action. The *Second Report on the State of the World's Plant Genetic Resources for Food and Agriculture* (Second Report) was launched by FAO in 2009. In response to the findings of the Second Report, the Commission updated the Global Plan of Action. The FAO Council, as mandated by the FAO Conference, adopted it as the Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture (Second Global Plan of Action) in 2011.

This synthetic account conveys the main messages of the Second Global Plan of Action and its priority activities. Unlike the Second Global Plan of Action, it has neither been negotiated nor approved by the Commission or any other body of FAO. For more detailed information on the adopted priority activities reference is made to the Second Global Plan of Action itself.¹

¹ <http://www.fao.org/docrep/015/i2624e/i2624e00.pdf>



The challenges ahead

The world's population is growing by an estimated 80 million people per year. A 60 percent increase in world food production over current levels will be needed to feed us all by 2050. Besides, the number of undernourished people has grown steadily in the last 15 years – from just under 800 million in 1996 to 925 million in 2010. The increased food insecurity is reflected *inter alia* in highly volatile food prices. Globalization and rapid urbanization are influencing consumption patterns, including the replacement of traditional diets with foods that are higher in energy and fat.

To ensure the food and nutrition security of all people – particularly poor people in developing countries, who will be hardest hit by any food shortages – a better use of a broader range of the world's PGRFA is of pivotal importance. Farmers will need nutritious crop varieties that can yield more under diverse conditions, without ever-increasing amounts of fertilizers and other agrochemicals. Because of the limited scope for growth in the world's cultivated areas, each new generation of varieties will have to be more productive than its predecessors.

Climate change poses another challenge to the world food supply. Greater weather variability, warmer temperatures, shorter growing seasons, shrinking water supplies and new pests and diseases will place

unprecedented stress on agricultural systems. As weather patterns change, the most diverse systems – those that have and use the most crop diversity – are likely to be the most adaptable. Growing a range of local crops and varieties can help adapt to climate change by maintaining ecosystem resilience. Consequently using PGRFA to develop crop varieties that can survive pests and diseases, heat, drought, flood and other extremes of weather is essential for adaptation of agricultural systems to climate change.

Whereas crop diversity is a powerful tool for adaptation to changing environmental conditions, it is also under considerable threat, including from climate change. Higher temperatures will reduce crop yields, limit or change areas available for crop production as well as threaten crop relatives growing in the wild. This places significant, new pressures on crop diversity that was already at risk: in the past 50 years, genetically uniform crop varieties have replaced many thousands of local varieties over huge areas of production.



Why a Second Global Plan of Action for PGRFA?

The growing challenges we face today – famine and malnutrition, rising food prices, population growth and climate change, among others – have made the conservation and sustainable use of PGRFA even more pressing than ever, thus reinforcing the importance of the Global Plan of Action. Since the Global Plan of Action was formulated and adopted in 1996, substantial changes have occurred which have made it necessary to update the Global Plan of Action:

- New **developments and trends in agriculture**, such as the increase of international seed trade, have significant impact on the conservation and use of PGRFA.
- Over the past 15 years, considerable information has become available on the **extent and nature of the genetic erosion** and vulnerability of PGRFA. Strategies for the conservation and use of PGRFA should fully take into account most recent findings regarding the major causes of genetic erosion, which include replacement of farmers' varieties/landraces, land clearing, overexploitation, reduced water availability, population pressures, changing dietary habits, environmental degradation, changing agricultural systems, overgrazing, legislation and policy, pests, diseases and weeds.
- Since 1996, major **advances in key areas of science and technology** and the **growing interest in new products** derived from agriculture – such as biofuels – have increased both the means and the incentives to conserve and use crop diversity. These advances include the rapid development of information and communication technologies and of molecular and genomic methods. They allow for the generation of additional and much more detailed information as the extent and distribution of genetic diversity and can be used in the development of strategies for the conservation and use of PGRFA.
- **Climate change** is now recognized as an immediate and unprecedented threat to livelihoods and food security. Growing attention is therefore being paid to crop diversity, in particular crop wild relatives and traditional varieties, as raw material for crop adaptation.
- During the past 15 years, there have been major **policy developments** with impact on the conservation, use and exchange of PGRFA. Undoubtedly, the most important one has been the International Treaty on Plant Genetic Resources for Food and Agriculture which entered into force in 2004. Through its Multilateral System, the International Treaty facilitates access to

PGRFA and allows the fair and equitable sharing of benefits arising from their use. The Global Plan of Action provides the technical blueprint for the funding decisions of the International Treaty and the Global Crop Diversity Trust also established in 2004. The tenth meeting of the Conference of the Parties to the Convention on Biological Diversity adopted a revised and updated Strategic Plan for Biodiversity for the 2011-2020 period, which the United Nations General Assembly declared the United Nations Decade on Biodiversity, with a view to contributing to the implementation of the Strategic Plan.

The Second Report, published in 2010, provided a solid basis for updating the 1996 Global Plan of Action. In addition, a series of consultations in all regions, as well as inputs from experts, helped ensure that the Second Global Plan of Action is current,

forward-looking and relevant to global, regional and national decision-makers and stakeholders. Its adoption by the FAO Council on 29 November 2011 reflects the world community's continued commitment to improving the conservation, use and exchange of plant genetic diversity to tackle the new challenges and embrace new opportunities that have emerged since 1996.

This synthetic account provides a brief overview of the 18 priority activities of the Second Global Plan of Action, which are organized into four main groups, namely:

- *In Situ* Conservation and Management
- *Ex Situ* Conservation
- Sustainable Use
- Building Sustainable Institutional and Human Capacities



Priority activities of the Second Global Plan of Action



In situ conservation and management

The conservation of PGRFA in natural ecosystems and their on-farm management provide for the continued evolution and adaptation of these resources to changing environmental forces, and thus for the generation of new diversity that is important for future crop improvements. Farmers and indigenous and local communities play a critical role in the development and conservation of plant genetic diversity *in situ*, especially on farm.

1. Surveying and inventorying plant genetic resources for food and agriculture

Knowledge of the existing crop diversity, its distribution and evolution over time is an essential pre-requisite for developing effective and efficient PGRFA management strategies. A number of PGRFA surveys have been carried out over the past decade; however, they have usually been restricted to single crops or small areas and efforts to inventory plants in protected areas have been quite limited.

This priority activity aims to facilitate the development, implementation and monitoring of complementary conservation strategies and national policies related to the conservation and sustainable use of PGRFA. It also aims to improve and apply methodologies, including geographic information systems (GIS), remote sensing and molecular markers, for surveying, inventorying and assessing threats to PGRFA. Surveying and inventorying will require stronger links between

ministries of agriculture and environment, both nationally and within regions. Indicators are needed to monitor changes in the distribution of diversity and to aggregate information on individual species and populations. Indigenous and local knowledge should be recognized as an important component of surveying and inventorying PGRFA, and carefully considered and documented where appropriate and with the prior informed consent of indigenous and local communities.

2. Supporting on-farm management and improvement of plant genetic resources for food and agriculture

Farmers grow modern varieties for various reasons, including marketability, family food security and environmental sustainability. Although these choices often result in significant genetic erosion, the last two decades have shown that many farmers in the developing world, and increasingly in developed countries, continue to maintain significant crop diversity in their fields. Farmers appreciate diversity because it enables crops to adapt to marginal or heterogeneous environments. PGRFA have been recognized as critically important for the development of farming systems that are resilient to climate change and play a role in the control of greenhouse gases.

This priority activity aims to promote and improve the effectiveness of on-farm conservation, management

and use of farmers' varieties/landraces, crop wild relatives, underutilized crops, wild food plants and rangeland genetic resources, and their integration with *ex situ* conservation efforts. It also aims at realizing Farmers' Rights at national and regional levels and according to national legislation and priorities, including the equitable sharing of benefits arising from the use of PGRFA. The role played by women in on-farm management of PGRFA should be given due attention. This activity also envisions addressing the traditional seed exchange and supply systems at local community levels through strengthening of local markets, community gene banks as well as fostering the future emergence of



public and private seed companies and cooperative enterprises.

3. Assisting farmers in disaster situations to restore crop systems

Natural disasters and civil strife often wreak havoc on agricultural systems. This particularly affects small-scale and subsistence farmers in developing countries. In the aftermath of disasters, it is often difficult for farmers to obtain locally adapted seed – even if it is available – because they lack the financial means. Grain imported as food aid is frequently used as seed even though it may not be adapted to local conditions. In the long run, inappropriate food and seed aid practices in post-disaster situations can intensify hunger, undermine local seed systems and increase the cost of donor assistance. In the past decade, a new thinking engendered by the need for a seed security framework has led to better coordination among agencies and new types of seed interventions, moving beyond direct distribution of seeds and other inputs to farmers. These include market-based approaches, such as seed vouchers and input trade fairs and community-based seed multiplication initiatives for both farmers' and improved varieties.

This priority activity aims to establish a seed security framework whereby governments develop and implement strategies for disaster responses that fully support the re-emergence of local seed supply systems. This activity will support efforts to collect farmers' varieties and crop wild relatives – particularly from areas that are vulnerable to disasters – and conserve them in national and international gene banks in case of need. Mechanisms should be established to identify, acquire, multiply and deliver high-quality locally adapted seed to stressed communities. Preventive community-based seed multiplication programmes should complement these mechanisms.

4. Promoting *in situ* conservation and management of crop wild relatives and wild food plants

Many national parks and protected areas harbour a wide range of wild food plants and crop wild relatives. Wild plants can be an important component of local diets – especially in poor growing seasons – and wild relatives of crop plants are an increasingly

critical resource for crop improvement. Yet little thought has been given to assessing the threats to wild plant genetic diversity in protected areas, let alone to conserving it *in situ*.

This priority activity aims to promote the sustainable use and conservation of crop wild relatives and wild food plants of importance to food and agriculture both within and outside protected areas. This will involve: measuring the threats to these plants; developing strategies and management plans to protect them *in situ*; promoting complementarity between conservation and sustainable use in parks and protected areas also by increasing the participation

of indigenous and local communities; and creating a better understanding of the contributions of crop wild relatives and wild plants to local economies, food security and environmental health. Information on crop wild relatives and wild food plants and related threats should be collated and made widely available including through national information sharing mechanisms and specialized information systems. The activity also aims at establishing better communication between, and coordination among, the various bodies engaged in *in situ* conservation and land-use management at national and regional levels, especially between the agriculture and the environment sectors.





Ex situ conservation

National gene banks conserve about 6.6 million of the total of 7.4 million accessions held worldwide, a total that has increased by about 20 percent since 1996. While many gene banks provide adequate storage conditions for the materials they hold, others need to be further developed and strengthened. Coverage of crops in gene banks is also uneven, with much useful crop diversity found only in the wild or on farmers' fields.

5. Supporting targeted collecting of plant genetic resources for food and agriculture

Much of the genetic diversity of major crops – such as wheat and rice – is already held in gene bank collections; collections of most regional, minor and underutilized crops are far less complete. Crop wild relatives, even of major crops, have received scant attention relative to their potential importance in breeding. Less than optimal conditions in gene banks may also have caused the loss of collected materials. Meanwhile, changes in climate and land use and the replacement of traditional varieties with modern types are threatening PGRFA as never before.

The aim of this priority activity is to collect and conserve PGRFA and associated information, focusing on diversity that is missing from *ex situ* collections, under threat or expected to contain useful traits. Special attention should be given to crop wild relatives and minor and underutilized species. Collected material should be conserved in

facilities with the capacity to manage them in the country of origin whenever possible and a duplicate sample deposited elsewhere for safety purposes, as agreed by the country of origin prior to the collecting mission.

6. Sustaining and expanding *ex situ* conservation of germplasm

While countries have expressed an interest in holding collections of underutilized crops, wild food species, forages and crop wild relatives, these species are generally more difficult to conserve in gene banks than are major food or forage crops. Even some globally important crop species – such as banana – do not produce seed that can be stored at low temperatures and low humidity; nor has there been much investment in the development of low cost technologies to conserve them. Many national programmes face major technical and administrative problems. Their gene bank facilities are deteriorating and they cannot perform basic conservation functions, regeneration being a particular gap.

This priority activity aims to ensure the development of a rational, efficient, goal-oriented and sustainable system of *ex situ* conservation and use for both seed and vegetatively propagated species. Sufficient capacity should be developed to provide options to countries for the voluntary storage of useful genetic materials and their duplicates. Conserved materials should be replicated and stored in long-term facilities

that meet international standards, in accordance with applicable international agreements. To reduce unnecessary redundancy of germplasm accessions in current programmes, holders of crop diversity – including national gene banks, breeders and non-governmental organizations – should coordinate and promote the exchange of information about PGRFA in line with national priorities and laws and relevant regional and international agreements, including the International Treaty.

7. Regenerating and multiplying *ex situ* accessions

Even under the best *ex situ* storage conditions, seeds eventually require regeneration to ensure their continued viability. While an accession may remain viable for many years – depending on the type of seed – low initial sample size or high demand by users can shorten the regeneration and multiplication cycle

significantly. Research has found that regeneration backlogs exist for all crops and in all regions and that regeneration capacity has declined in several national gene banks. Inadequate documentation on accessions continues to be a constraint to a rational global approach to regeneration, although the necessary information is now increasingly available electronically.

The aim of this priority activity is to regenerate and multiply *ex situ* accessions in order to satisfy needs for conservation, distribution and safety duplication. Particular attention should be paid to regenerating material that is experiencing a loss of viability, that is globally unique and under threat in the field, and that is in, or intended for placement in, long-term storage. Whenever possible, regeneration partnerships, priorities and strategies should be established with inputs from crop and regional networks.



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Sustainable use

Conserving crop resources without ensuring that they are used, amounts to nothing more than an archiving exercise. It is only by using crop diversity that countries can take advantage of its potential to foster economic development, reduce hunger and poverty and provide options for agriculture to cope with climate change.

8. Expanding characterization, evaluation and further development of specific subsets of collections to facilitate use

In order for breeders and other users of PGRFA to make the most effective use of gene bank collections, they must be able to identify which accessions are likely to have the traits they need. The answer lies in the characterization and evaluation data that should accompany each accession. Characterization data record a plant variety's distinct and heritable defining features. Evaluation data record the traits that are promising for crop improvement. This information can also help gene bank managers to organize subset collections based on particular traits or that feature maximum diversity. These subsets have been shown to significantly improve the use of gene banks.

This priority activity aims to enhance the use and management of plant genetic resources held in gene banks, to fill data gaps and make it easier for users to access characterization and evaluation information so that these resources can be deployed directly in

the field or used in research and crop improvement. It will be particularly important to assess gene bank accessions and breeding materials for traits associated with mitigation and adaptation to climate change. The goal is to make gene bank collections as useful as possible. This activity may involve developing and adapting molecular techniques, like high-throughput evaluation methods for gathering characterization and evaluation data, creating core and trait-specific collections, particularly for crops of global importance and improving the exchange of characterization and evaluation data.

9. Supporting plant breeding, genetic enhancement and base-broadening efforts

Plant breeding programmes are still often ill equipped to meet the demands placed upon them – particularly in light of climate change. There is a serious shortage of plant breeders in both the public and private sectors. Breeding programmes do not take enough advantage of the diversity available in gene banks nor do they often seek out the perspectives of farmers and other users when setting priorities. Besides, breeders make little use of techniques such as pre-breeding or genetic enhancement, which make collections more useable by furnishing breeding materials with traits to increase yields and resist pests and diseases and by increasing the amount of diversity available.



The aim of this priority activity is to support the development of resilient crop varieties that guarantee high yields under adverse environmental conditions and minimal input agricultural systems. This activity will promote pre-breeding and genetic enhancement, including by pooling the resources of gene banks and breeding programmes to ensure user access to the widest range of diversity possible. Breeders should pay greater attention to under-researched crops and should make greater use of crop wild relatives as a source of genes for adapting crops to climate change. Capacity building, policies promoting participatory plant breeding and financial support for the routine use of new breeding tools will be critical to the success of this activity.

10. Promoting diversification of crop production and broadening crop diversity for sustainable agriculture

Agricultural systems that depend too heavily on a limited number of crop varieties and species lack stability and resilience and are prone to yield losses due to pests and diseases. New challenges to agriculture point to the need to introduce more crop and species diversity into production systems to support agricultural sustainability. These include the need for

long-term sustainability in agricultural practices, the challenges and opportunities posed by the production and use of biofuels, food and nutritional security and rural development, and climate change.

The aim of this priority activity is to promote sustainable agriculture by increasing diversity of crops and varieties on farm so as to reduce genetic vulnerability and boost productivity. Research is needed on domesticating wild species and using underutilized crops to develop crops and varieties that are more nutritious and are adapted to climatic change. It will be critical to involve local breeders and farmers in this activity to ensure that the varieties are adapted to local conditions and requirements. Governments should adopt adequate policies to support diversified production systems, including the use of multilines, mixtures and different integrated pest management strategies.

11. Promoting development and commercialization of all varieties, primarily farmers' varieties/landraces and underutilized species

Today, commercial production systems pay little if no attention to the many traditional crops that are used

by farmers and indigenous and local communities to meet their needs for food, fibre and medicine. Knowledge concerning the uses and management of these varieties and species is often localized and specialized. Increasingly, this diversity at both the species and variety levels is being replaced by a certain level of uniformity in the agricultural marketplace as varieties are bred to meet the needs of industrial production and processing, as well as demanding market standards.

The aim of this priority activity is to create greater demand and more reliable markets for all varieties, primarily farmers' varieties/landraces and underutilized species. Local and national governments should foster public-private partnerships, adopt legislation to promote benefit sharing targeting farmers and traditional custodians, and encourage local and export markets to embrace products originating from traditional varieties and underutilized species. Marketing strategies take into account the need to value and document traditional knowledge linked to any commercialized varieties as well as the implications of commercialization for agricultural biodiversity.

12. Supporting seed production and distribution

Effective seed systems need to be in place to ensure that farmers can benefit from the potential of

both local and improved varieties to increase food production and adapt to climate change. In the last 20 years, there has been a significant growth of the private seed sector; however it has mainly focused on high value products, such as maize, wheat, rice, oil crops, pulse crops and vegetable crops. Farmers' seed systems and formal seed systems often operate side by side, but with different levels of success depending on the crop, the agro-ecological zone and output market opportunities. There is therefore a need to develop integrated approaches which strengthen both systems and the connections between them in order to produce and distribute seed of crop varieties that are useful for diverse and evolving farming systems.

This priority activity aims to increase the availability of high-quality seed of a wider range of plant varieties, including improved and farmers' varieties/landraces. Governments should support small-scale seed enterprises and promote seed production of crops and varieties that meet the needs of resource-poor farmers, particularly women. Supporting the development of a vibrant private seed sector will also require seed regulatory frameworks that take into account the characteristics of the different seed systems involved and are harmonized at the regional level.





Building sustainable institutional and human capacities

The implementation of all priority activities of the Second Global Plan of Action will require strengthened institutional and human capacities in all aspects related to conservation, use and exchange of PGRFA as well as supporting national policies, strategies and programmes in accordance with each country's specific priorities and development goals. Sustained management of agricultural biodiversity will also require access to better information in order to support the operational, technical and strategic decision making. It is equally important to raise public awareness of the importance and value of PGRFA to cope with climate change, increase food security and provide continuously ecosystem services.

13. Building and strengthening national programmes

Strong national PGRFA programmes help countries meet their food and development needs. In addition, they enable countries to benefit from international cooperation in this area. Yet many countries lack adequate policies, strategies, action plans and reliable funding to support PGRFA activities. Such activities are carried out by a growing number of actors, including private companies, governmental and non-governmental organizations, botanic gardens, farmers, indigenous and local communities and individuals. The integration of such different PGRFA actors in the framework of a unified and coherent national programme provides the opportunity to

add value to their diverse efforts so that the whole becomes bigger than the sum of its parts.

This priority activity aims to strengthen national capacity to ensure the safe conservation of important PGRFA – both *in situ* and in gene banks - and their use by farmers, breeders and other users in crop improvement, as well as the fair and equitable sharing of the benefits arising from that use. National programmes should establish or strengthen coordination and linkages between the agriculture and environment sectors and among all organizations concerned with conservation, crop improvement, seed production and seed distribution. It is important that national capacity is maintained in all technical and political aspects of conservation and use of PGRFA, including access to and use of PGRFA, as well as the fair and equitable sharing of the benefits arising from that use.

14. Promoting and strengthening networks for plant genetic resources for food and agriculture

The extent of interdependence among countries with respect to their needs to access to PGRFA and information held by others calls for strengthening networks, not only to facilitate the exchange of PGRFA, but also to provide a platform for scientific discussion, information sharing, technology transfer and research collaboration. Crop-specific networks give countries a voice in the development of global

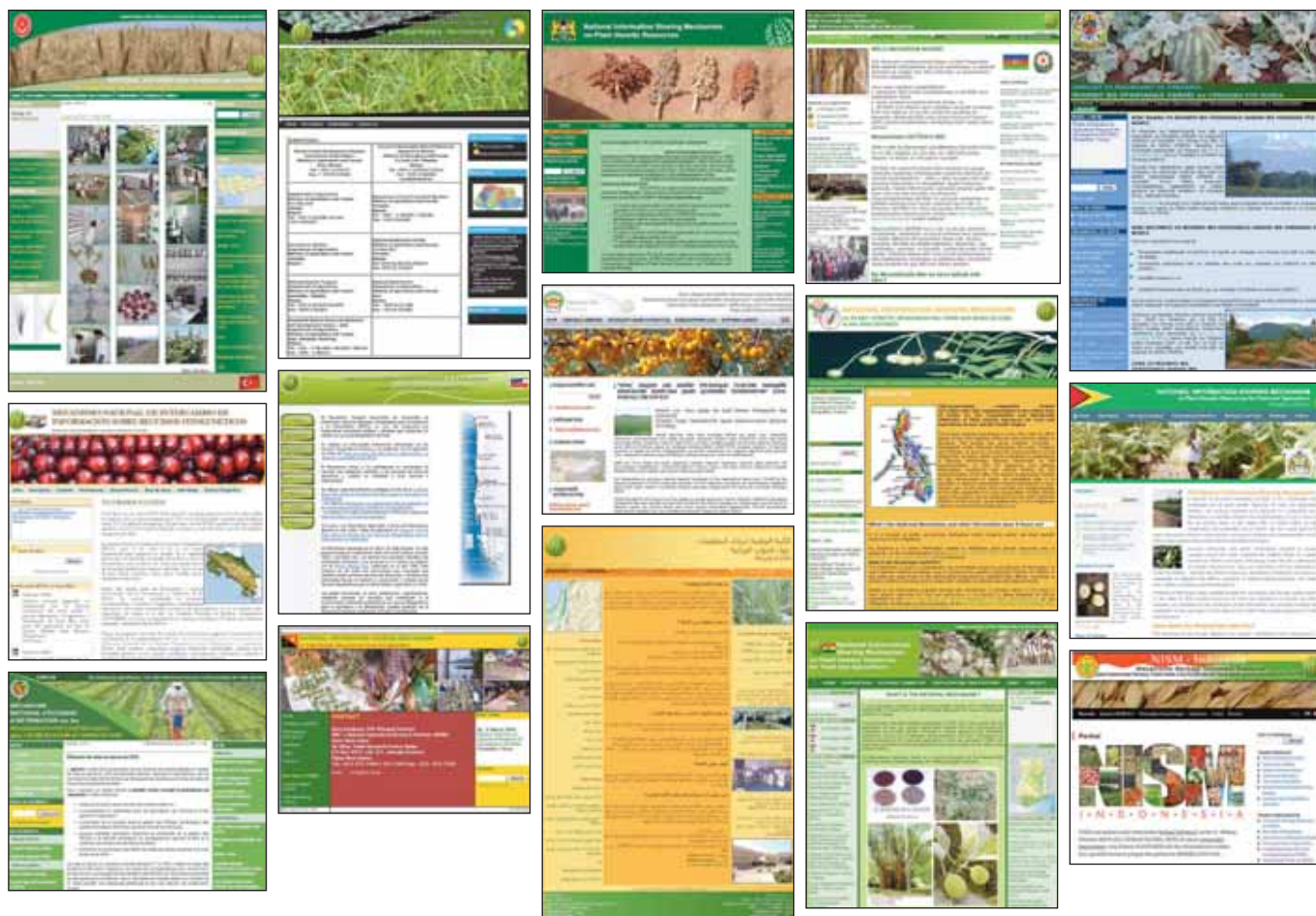
strategies by bringing together both managers and users of specific crops. Thematic networks strengthen coordination and prevent duplication of efforts on a particular topic. Both types of networks can foster the partnerships and synergies needed to support a rational global system for *ex situ* conservation and use. Yet all networks face a similar challenge: the long-term availability of resources to keep them going.

The aim of this priority activity is to foster partnerships and synergies among countries in order to develop a more rational and cost-effective global system for the conservation and use of PGRFA. Encouraging broader participation in networks, including by women farmers and indigenous and local communities, and ensuring the involvement of public-private partnerships, will increase their reach and relevance. This priority activity also aims to facilitate setting integrated ecoregional, regional and thematic goals

and priorities for the conservation and sustainable use of PGRFA. Networks are not particularly costly; however, resources are needed for travel, communications and meetings. Networks should be self-sustaining whenever possible. All countries should endeavour to strengthen regional networks, including through inter-network collaboration. Such collaboration can enhance capacity building, joint research and technology transfer.

15. Constructing and strengthening comprehensive information systems for plant genetic resources for food and agriculture

Driven by the information technology revolution, there have been massive improvements in the availability and user-friendliness of PGRFA information over the past two decades. Nonetheless, there are still major gaps in the information



available, including incomplete documentation of gene bank holdings worldwide, which represent a serious obstacle to efficient planning and use of PGRFA in research and crop improvement. Much existing data is still not accessible electronically and little information is available about on farm genetic resources and crop wild relatives. A significant imbalance exists among regions and even among countries within regions with regard to their ability to access, manage and disseminate information.

This priority activity aims to strengthen the capacity of countries to manage PGRFA data and to support their participation in regional and global information systems. It also aims to enhance the use of regional and global information systems and to strengthen the exchange and use of information and the sustainability of current information systems. The effectiveness of information systems should be monitored and differences between systems adequately addressed to facilitate interoperability and promote use. Existing data need to be verified and additional baseline data need to be collected for monitoring progress on sustainability and food security. The information held in national systems should be readily available to all actors with an interest in PGRFA.

16. Developing and strengthening systems for monitoring and safeguarding genetic diversity and minimizing genetic erosion of plant genetic resources for food and agriculture

The genetic diversity of our crop plants is being lost at an unprecedented rate due to a complex combination of drivers, be they natural phenomena or results of human behaviour, including climate change, urbanization, agricultural development and civil strife. While molecular techniques now make it possible to generate data on genetic erosion for particular crops in specific locations, better techniques are nevertheless needed for monitoring genetic diversity, establishing baselines and monitoring trends. To date, no really practical and internationally accepted indicators of genetic erosion or genetic diversity are available.

This priority activity aims to assess threats to the genetic diversity of key crops and to take precautionary or corrective action as necessary, as well as to establish and implement monitoring mechanisms for genetic erosion in *ex situ* collections,

on farm and in natural ecosystems. This activity will require improved methods and a stronger capacity for carrying out inventories and surveys using new molecular and GIS tools. Indicators are also needed for assessing genetic erosion over time, baselines for monitoring genetic erosion and effective early warning systems. These should be linked to systems at the regional and international levels and should include relevant information generated by extension services, local non-governmental organizations, the seed sector and farming communities.

17. Building and strengthening human capacity

Despite increased training opportunities available in areas related to PGRFA conservation and use, gene banks are understaffed in many countries, while existing staff are often not trained in key gene bank management activities. This lack of capacity threatens efforts to establish and manage valuable PGRFA collections. Inadequate plant breeding capacity in most developing countries severely limits the use of PGRFA. Extension services and non-governmental organizations often lack qualified personnel that can provide adequate training on seed production and technology and on-farm conservation to indigenous and local communities.

This priority activity aims to strengthen national capacity to conserve and use PGRFA in critical areas including management, legal and policy aspects, and to stem the loss of trained personnel from developing countries. Governments should encourage including aspects of PGRFA in primary, secondary and advanced education and should provide training on conservation and use for young researchers, technicians and development workers. Special consideration should be given to providing training for rural women, as they play a significant but underappreciated role in maintaining and developing PGRFA and associated knowledge and traditions. This priority activity also aims to develop a sound research agenda to bridge the gap between the science of PGRFA and its application to management and gene bank activities. It further seeks to expand opportunities for hands-on learning, mentoring and leadership training in research and development and policy areas at policy and research organizations at all levels.



18. Promoting and strengthening public awareness on the importance of plant genetic resources for food and agriculture

Public awareness mobilizes popular opinion and spurs political action. It can also promote the development of international links and collaborative mechanisms, such as networks, and attract new partnerships from the private sector, civil society and indigenous and local communities. One message does not fit all audiences and public awareness interventions should be carefully planned and aligned with the interests and priorities of the target audiences.

The aim of this priority activity is to establish public awareness campaigns and activities targeting key

target audiences, such as donors, policy-makers, educational institutions and the media. Public awareness campaigns must be strategic, concrete and realistic. It is advisable to link to like-minded communications efforts at regional or global levels. It may be possible to adapt existing tools and messages to local circumstances, thus greatly reducing costs. Social networking tools provide an extremely effective way to get messages across to a significant number of people, in particular younger generations. Media training and the recruitment of well-known and influential spokespeople are additional strategies for putting messages about crop diversity in the public eye.



Implementing and financing the Second Global Plan of Action

The Second Global Plan of Action provides an important internationally agreed framework for the conservation and sustainable use of PGRFA. It is a supporting component of the International Treaty (Article 14) and its implementation will be an essential contribution to achieving the objectives of the International Treaty. The Second Global Plan of Action will also facilitate the implementation of the Convention on Biological Diversity in the area of agricultural biodiversity and help reach the targets of the Strategic Plan for Biodiversity 2011-2020. By providing technical assistance, capacity building, information tools and knowledge FAO helps countries to implement the Second Global Plan of Action.

The realization of its priority activities calls for a concerted action at the local, national, regional and international levels, involving all relevant actors. This comprises governments, local and regional authorities, regional and international organizations, the scientific community, the private sector, indigenous and local communities, breeders and farmers.

The full implementation of the Second Global Plan of Action requires a significant increase in PGRFA activities and adequate financial resources should be mobilized. Each country should make every possible effort to provide, in accordance with its capacities, financial support with respect to national activities

that are intended to achieve the objectives of the Second Global Plan of Action, in line with national plans, priorities and programmes.

International cooperation for the conservation and sustainable use of PGRFA should be strengthened, in particular to support and complement the efforts of developing countries and countries with economies in transition. The extent to which these countries will effectively meet their commitments under the Second Global Plan of Action will largely depend on the effective implementation of the International Treaty and of two relevant elements of its Funding Strategy: the Benefit-sharing Fund and the Global Crop Diversity Trust. Every effort should also be made to seek new, additional and innovative sources of funding within the course of the implementation of the Second Global Plan of Action.

Monitoring of progress in the implementation of the Second Global Plan of Action will be guided by governments and other FAO Members through the Commission on Genetic Resources for Food and Agriculture, and based on internationally agreed reporting formats and indicators. Progress will be reported to the major international, regional and national bodies and fora dealing with food and agriculture and biodiversity and their member constituencies will be invited to promote and take part, as appropriate, in the implementation of the Second Global Plan of Action.

The Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture was adopted by the FAO Council at its 143rd Session in 2011. It updates the Global Plan of Action for Conservation and Sustainable Utilization of Plant Genetic Resources which was adopted at the Fourth International Technical Conference on Plant Genetic Resources held in Leipzig in 1996.

The Second Global Plan of Action addresses new challenges, such as climate change and food insecurity, as well as novel opportunities, including information, communication and molecular methodologies. It contains 18 priority activities organized in four main groups: *In situ* conservation and management; *Ex situ* conservation; Sustainable use; and Building sustainable institutional and human capacities.

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