



**Food and Agriculture  
Organization of the  
United Nations**



**The International Treaty  
ON PLANT GENETIC RESOURCES  
FOR FOOD AND AGRICULTURE**

## **Item 12 of the Provisional Agenda**

### **NINTH SESSION OF THE GOVERNING BODY**

**New Delhi, India, 19–24 September 2022**

### **Background Study on Bottlenecks and Challenges to the Implementation of Articles 5 and 6 of the International Treaty**

#### **Note from the Secretary**

*The implementation of Articles 5 and 6 of the International Treaty is a standing item on the agenda of the Governing Body of the International Treaty. At its Eighth Session, the Governing Body requested the Ad Hoc Technical Committee on Sustainable Use of PGRFA (Committee) to “recommend further steps on how the Governing Body can assist Contracting Parties in advancing the implementation of Articles 5 and 6 of the International Treaty for consideration of the Governing Body at its Ninth Session”. At its 5th meeting, the Committee highlighted the opportunity to develop country-/region-specific studies to address the poor implementation of Articles 5 and 6.*

*In response to the need expressed by the Committee to develop country-/region-specific studies to assist in identifying opportunities to address the poor implementation of Articles 5 and 6, the Secretariat commissioned a Background study on the bottlenecks and challenges to the implementation of Articles 5 and 6.*

*Although there is great diversity among and within the regions, the results of the background study show that four types of bottlenecks and challenge are relevant across the regions to a greater or lesser extent: 1. Legal, policy and institutional challenges; 2. Technical and scientific issues; 3. Seed distribution and marketing of landraces and farmers’ crop varieties; and 4. Resource constraints. At the same time, the different ways in which the various challenges present themselves in each region highlights the need for greater attention to be paid by the global plant genetic resources for food and agriculture (PGRFA) community to the characteristics of each specific context at local, national and regional levels, in order to meet the challenges of climate change adaptation, food security and biodiversity loss.*

*This background study therefore strongly recommends:*

- (1) conducting a regular assessment of the gaps, needs and challenges in the conservation and sustainable use of PGRFA at regional/national level, in order to better evaluate progress in the implementation of Articles 5 and 6 of the International Treaty and help to determine opportunities for improvement and collaboration to address those issues;*
- (2) inviting a greater number of countries to submit their national report in order to enable a more comprehensive analysis of the gaps, needs and challenges in the conservation and sustainable use of PGRFA at regional/national level; and*
- (3) developing more country-/region-specific studies to address the poor implementation of Articles 5 and 6 of the International Treaty.*

FAO-ITPGRFA documents can be consulted at: [www.fao.org/plant-treaty/meetings/meetings-detail/en/c/1259571/](http://www.fao.org/plant-treaty/meetings/meetings-detail/en/c/1259571/)

***Important note:*** This document serves as information document to the Ninth Session of the Governing Body of the International Treaty and will be replaced with the final version for publication following standard editorial review.

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## 1. EXECUTIVE SUMMARY

### Introduction

In response to the need to address the poor implementation of Articles 5 and 6, the Secretariat of the International Treaty on Plant Genetic Resources for Food and Agriculture (hereafter, the International Treaty) prepared a *Background study on the bottlenecks and challenges to the implementation of Articles 5 and 6* (Background study). Keeping in mind that there is great diversity among and within the regions, the study has identified four main types of bottleneck to the conservation and use of plant genetic resources for food and agriculture that are of greater or lesser significance, depending on the regions and countries concerned: (1) Legal, policy and institutional challenges; (2) Technical and scientific issues; (3) Seed distribution and marketing of landraces and farmers' crop varieties; and (4) Resource constraints.

### Africa

In Africa, most reporting countries and stakeholders highlighted the lack of a policy to promote farmer innovation in plant breeding and more than 25 percent of reporting countries do not have seed legislation that covers the sale of traditional seeds and/or recognizes farmers' varieties and informal seed systems. The efficiency of the national legal and policy framework is further hindered by implementation, coordination and awareness-raising issues. In relation to technical and scientific issues, conservation of PGRFA is challenging in some countries due to the lack of efficient and sustainable systems for inventory and *ex situ* conservation. The lack of access to characterization and germplasm processing tools has resulted in important gaps in collections, especially with regard to crop wild relatives (CWR), landraces, millet, sorghum, landraces and indigenous fruits and vegetables. About one-third of survey respondents from Africa reported difficulties in gaining access to plant genetic material for use in commercial improvement programmes or in public research programmes on (pre-)breeding and/or conservation. In some countries, there is no breeding sector. Generally speaking, the efficiency of the PGRFA use system in this region is hampered by gaps in the policy framework, especially for supporting the wider use of diversity of varieties and species and for strengthening research that enhances and conserves biological diversity by maximizing intra- and inter-specific variation. In addition, nearly half of stakeholders from Africa reported difficulties in accessing sufficient quantities of seed of an adequate range of crop varieties and most stakeholders consider marketing opportunities for landraces and farmers' crop varieties to be non-existent. The lack of research interest in minor crops, landraces and farmers' varieties, coupled with lack of a market structure, are significant challenges. In this region, there is a general lack of technical capacities and human and financial resources, including for the collection, characterization, evaluation, documentation, regeneration and use of modern technologies in plant breeding. The highest priorities in terms of capacity-building needs are for providing/improving market opportunities for landraces/farmers' varieties, novel characterization techniques, and sustainable use policy development/implementation.

### Asia

Although all reporting countries from Asia have adopted laws or policies for all or some of the facets of the PGRFA conservation and use system, a large majority of stakeholders consider that the policy and legal measures in place to promote the sustainable use of PGRFA do not cover all the elements of use of PGRFA and/or there are problems with their implementation. Furthermore, many reporting countries highlighted difficulties in implementing laws, policies and strategies because these are ill-conceived and short-sighted, and/or due to the lack of human, technical and financial resources, as well as limited intersectoral coordination among the relevant agencies. In Asia, some countries have stressed the lack of activities in specific types of crops and varieties, including CWR, non-economic and minor crops. In addition,

countries experience technical difficulties in maintaining genetic diversity, especially in vegetative plant propagation, and in accessing and using molecular tools. In this region, half of all stakeholders highlighted complications in obtaining plant genetic material for crop improvement, mainly due to gaps in *ex situ* collection coverage, especially for underutilized crops and CWR, and the lack of characterization and evaluation of material. Access to information associated with plant genetic resources (PGR) is also problematic for a high proportion of stakeholders, especially with regard to information on PGR material available for crop improvement. Reasons include inadequate data management in national gene banks; lack of publicly available operational online databases; and lack of information on material containing specific traits. The PGRFA use system is further undermined by gaps in the policy framework, especially for reviewing and adjusting breeding strategies and regulations concerning variety release and seed distribution; promoting the expanded use of local and locally adapted crops, varieties and underutilized species; and strengthening research that enhances and conserves biological diversity. In relation to access to seed, about one-third of stakeholders from Asia report difficulties caused by the fact that information held in national gene banks is not transparent and is often not accessible to the public; quantities of seed in gene banks are limited; and systems for multiplication are lacking. In this region, changes in food habits, coupled with greater emphasis on the production, marketing and consumption of high-value crops, hinder the promotion and marketing of landraces and indigenous and farmers' crops. Marketing opportunities, when they exist, are not being promoted adequately and policies to support marketing of landraces and farmers' varieties are not properly implemented. Capacity building in Asia is primarily needed for sustainable use policy development/implementation, providing/improving market opportunities for landraces/farmers' varieties, and establishing and managing participatory plant breeding (PPB) and/or participatory varietal selection (PVS) programmes.

## Europe

In Europe, a few countries have reported lack of legislation, programmes or strategies in all or specific aspects of conservation and use of PGRFA, for instance to support on-farm and *in situ* conservation of heritage cultivars, CWR and landraces. In addition, policy promoting farmer innovation in plant breeding is lacking in many countries and restrictive seed regulations do not support the informal seed sector and/or PPB. In this region, *in situ* CWR and wild food plants (WFP) conservation have been neglected. There are also broad discrepancies in the quality and efficiency of *ex situ* conservation across the European region. Furthermore, obtaining PGR material for crop improvement can be difficult due to a lack of characterization and evaluation data for traditional crops, CWR and wild species. The poor operation of, and lack of coordination among gene banks, coupled with complex and time-consuming procedures, are also important bottlenecks. Other challenges include difficulties in accessing adequate information due to the incomplete nature of data on the status of PGRFA; lack of systematic inventorying of CWR and the scarcity of information on the genetic variability of wild populations; the incomplete nature of the characterization and evaluation of national collections, especially for minor crops; and the lack of integrated national information systems or online databases on germplasm holdings. Generally speaking, countries from Europe have expressed the need to position the utilization of PGRFA higher on their agendas. Policies are particularly lacking for reviewing and adjusting breeding strategies and for supporting the wider use of diversity of varieties and species and creating strong links to plant breeding and agricultural development. Furthermore, very few national programmes promote PPB, and interactions between public institutions and farmers for the purpose of PVS are almost non-existent in some European countries. In addition, a significant proportion of stakeholders from Europe find it difficult to gain access to sufficient quantities of seed and contend that there are no adequate marketing opportunities for landraces and farmers' crop varieties. Marketing opportunities may be inadequate, primarily due to limited consumer interest in landraces and

because prohibitive legislation regarding variety registration and seed certification may discourage such markets, and/or be complex and costly, and/or may not be well known or properly implemented. In this region, stakeholders have emphasized the lack of skilled human resources and professional research staff within many European gene banks. The most important areas in terms of capacity-building needs are novel characterization techniques, managing and providing access to PGRFA-related data, providing/improving market opportunities for landraces/farmers' varieties, and the development/implementation of policy on the use of PGRFA.

### **Latin America and the Caribbean**

In Latin America and the Caribbean, a few countries do not have specific legislation and policy in place for the conservation and use of PGRFA, or the legislative framework and policies in place are not adequate or need updating, especially with regard to seed laws. The lack of policies to promote farmer innovation in plant breeding is a cause of particular concern in the region, with more than 60 percent of survey respondents of the opinion that such policy is not in place. This is partly due to a lack of awareness among policy-makers of the role of farmers in innovation and plant breeding. In this region, there is a lack of scientific interest and activities in specific types of crops, species and varieties, including with regard to lowland germplasm, CWR, wild plant species and underutilized species that have little commercial value. In some countries, access to advanced technologies such as molecular tools and DNA markers is difficult and monitoring of the maintenance of genetic integrity, limited to food security crops, is done by using agro-morphological markers only. Almost 40 percent of stakeholders from Latin America and the Caribbean stressed difficulties in obtaining plant genetic material for crop improvement due to the poor functioning of national gene banks; complicated, time-consuming and costly procedures for accessing material; lack of direct linkages between *ex situ* conservation and *in situ* conservation programmes; and the lack of comprehensive collections for neglected and underutilized crops, among others. In this region, the lack of centralized and integrated information and documentation systems, coupled with weaknesses in the form and frequency of records, pose substantial challenges to the use of PGRFA. Generally speaking, stakeholders from Latin America and the Caribbean have highlighted the need to pay greater attention to the implementation of Article 6 of the International Treaty. Particularly noticeable are gaps in policies to promote the expanded use of local and locally adapted crops, varieties and underutilized species; reviewing and adjusting breeding strategies; supporting the wider use of diversity of varieties and species; and promoting plant breeding efforts with farmers' participation. In addition, a very large majority of stakeholders consider that there are no adequate marketing opportunities for landraces and farmers' crop varieties and that access to sufficient quantities of seed of an adequate range of crop varieties is difficult. This is primarily because quantities of seed available for distribution are limited due to the cost of reproduction, and dependence on commercial seed and promotion of crops and varieties with commercial value tend to restrict the amount of PGRFA readily available to farmers. In this region, the highest priorities for capacity building are setting up and managing seed networks and providing/improving market opportunities for landraces/farmers' varieties. A large majority of stakeholders also consider that capacity-building needs in setting up and managing seed exchanges, establishing and managing PPB and/or PVS programmes, and developing/implementing policy on sustainable use of PGRFA, are important.

### **Near East**

Although a majority of reporting countries from the Near East have some policy and legal measures in place to promote the sustainable use of PGRFA, only a small minority of stakeholders consider that these are comprehensive and effective. The lack of policies to

support farmer innovation in plant breeding is particularly alarming, with nearly 60 percent of stakeholders declaring that such policies have not been adopted. The low levels of enforcement of existing legislation, the lack of coordination mechanisms among the relevant agencies and institutions, and lack of public awareness of the importance of PGRFA are significant challenges in this region. Among the technical issues for the conservation and use of PGRFA in the Near East are the lack of a mechanism to assess and monitor crop-targeted threats and genetic erosion on a regular basis, and the lack of comprehensive inventory work, especially on-farm. Furthermore, some countries require technical assistance for long-term conservation of PGRFA, including through the use of new technologies. Obtaining plant genetic material for crop improvement is challenging for one-quarter of survey respondents from this region, due to lack of communication and coordination between the different research entities; conflicts between national and international policies; and the lack of a publicly available online database, which makes access to information on conserved plant genetic diversity difficult. In some countries, there are no or very limited pre-breeding and breeding activities. Generally speaking, the poor communication technology and lack of access to molecular tools and advanced technologies are major challenges. Furthermore, gaining access to sufficient quantities of seed of an adequate range of crop varieties is problematic because there is no farmers' seed production, nor an established seed sector involving seed companies, nor any adequate seed distribution infrastructure. In addition, the quantities of seed in gene banks are limited, the prevalence of commercial varieties has resulted in the disappearance of traditional varieties, vegetable landraces and fruit landraces, and the prices of crops are too high. No fewer than half of stakeholders from the Near East believe that marketing opportunities for landraces and farmers' crop varieties are inadequate. As in many other regions, the marketing of landraces and, to a lesser extent, farmers' varieties, is very limited and is done on a very small scale, mostly at farmer level, due to the prevalence of commercial varieties. In this region, the two most important areas for capacity building are plant (pre-)breeding techniques and novel characterization techniques. For a large majority of stakeholders, there is also a need to increase capacities in developing/implementing policy on the sustainable use of PGRFA, as well as in conservation techniques and conservation planning.

### **North America**

In North America, many stakeholders consider that national policy in support of sustainable use is not comprehensive and/or effective. For instance, policies to promote farmer innovation in plant breeding are lacking, and there is a lack of coordination mechanisms among the public administrations involved. Difficulties in identifying the gaps and challenges in the conservation of PGRFA were reported. Another important challenge relates to the need to continuously regenerate PGRFA material to keep pace with demand for seed samples. Strikingly, the proportion of stakeholders who consider that obtaining plant genetic material for crop improvement is difficult is the highest of all regions. Reasons for this problematic access to PGR material include lack of coordination among countries; compliance with regulations on access and benefit-sharing (ABS) and conflicts between policies; and complications with accessing private materials before commercialization. Access to information associated with PGR is also seen as a challenge for a notable number of stakeholders due to the gaps in databases, especially when it is for conservation planning. In addition, although not as critical as in other regions, marketing opportunities for landraces and farmers' crop varieties are considered inadequate by one-quarter of stakeholders from this region, especially due to prohibitive regulations regarding variety registration and seed certification. Finally, even though capacity-building needs are lower in North America compared with other regions, about one-third of survey respondents highlighted the need to increase capacities in the development/implementation of policy on the sustainable use of PGRFA, in managing and providing access to PGRFA-related data, and in setting up and managing seed networks.

### **Southwest Pacific**

In Southwest Pacific, there are substantial gaps with regard to policies in support of sustainable use of PGRFA. More than 70 percent of survey respondents consider that such policies do not exist, or that they do not cover all the elements of sustainable use of PGRFA and/or that there are problems with its implementation. For instance, in many countries, policies to promote farmer innovation in plant breeding are not in place, and there is no – or only a very limited – standard and procedure for crop variety certification. In some countries, the conservation of PGRFA, especially annual crops, is undermined by a lack of financial, human and technical skills. While surveys have been conducted for the major staple crops, transport difficulties prevent the organization of collecting missions in remote areas. In addition, research into methodologies to identify targeted genetic variation has traditionally been neglected and the poor characterization, evaluation and documentation of PGRFA make it difficult to track genetic erosion. Southwest Pacific is the region where the highest percentage of stakeholders believe that there is not an adequate range of plant genetic material available for utilization in public research programmes or in commercial crop variety improvement programmes. Nearly half of the stakeholders from this region report difficulties in obtaining PGR material for crop improvement due to poor logistics for islands that are geographically remote; inadequate access to passport, characterization and evaluation data on the plant material available; low consideration of the private sector by the regional gene banks on which public research and breeding programmes rely to obtain plant genetic material; insufficient policies and guidelines promoting participation in commercial crop improvement programmes; and restrictive import policies, especially for CWR, as well as the costs associated with the import of germplasm. Furthermore, a large majority of stakeholders highlighted difficulties in accessing information on PGR material containing specific traits for crop improvement, as well as on conserved plant genetic diversity. In this region, critical challenges include a lack of characterization and evaluation data and of information on the agronomic and specific traits needed by breeders. Access to information is further hampered by inadequate data management in national gene banks; the poor understanding and inadequate practice of conservation planning; and fragmented information on potential collaborators for crop improvement programmes. In this region, some countries mentioned the lack of any commercial crop variety improvement programme, as well as PPB. Particularly lacking are policies in support of breeding strategies and regulations concerning variety release and seed distribution; expanded use of local and locally adapted crops, varieties and underutilized species; and research that enhances and conserves biological diversity by maximizing intra- and inter-specific variation. In this region, while there is no integrated effective seed system that facilitates access to quality seeds and planting materials, smallholder farmers are restricted by the cost of seed. Logistical issues also limit access to seed in remote areas. Changes in food habits, coupled with the promotion of varieties with commercial value and the lack of enabling legislation, marketing strategies and facilities, are additional challenges to the promotion and marketing of landraces and indigenous and farmers' crops. Capacity-building needs are substantial in this region, especially in terms of conservation planning, novel characterization techniques, managing and providing access to PGRFA-related data, establishing and managing PPB and/or PVS programmes, plant (pre-)breeding techniques, and the development and/or implementation of a policy on the sustainable use of PGRFA.



## 2. ACRONYMS

ABS	Access and Benefit-Sharing
AEGIS	A European Genebank Integrated System
BSF	Benefit-sharing Fund
CBD	Convention on Biological Diversity
CWR	crop wild relative(s)
ECPGR	European Cooperative Programme for Plant Genetic Resources
FAO	Food and Agriculture Organization of the United Nations
IPR	intellectual property right(s)
PBR	plant breeders' rights
PGR	plant genetic resources
PGRFA	plant genetic resources for food and agriculture
PPB	participatory plant breeding
PVS	participatory varietal selection
(S)MTA	(Standard) Material Transfer Agreement
UPOV	International Union for the Protection of New Varieties of Plants
WFP	wild food plant(s)

### 3. INTRODUCTION

As the world's population continues to swell, moving towards an estimated total of 9.7 billion people by 2050, and the consequent increased demand for food places unprecedented pressure on natural resources, 1 billion people go hungry every day. In this context, the conservation, exchange and sustainable use of agricultural biodiversity and the genetic resources that constitute such diversity are more important than ever to address global challenges, including food insecurity, biodiversity loss, climate change and poverty. While climate change poses unprecedented challenges to food, nutrition, health and economic security, PGRFA are key to sustainable agriculture and food production, as they provide the critical resources needed by farmers, breeders and biotechnologists to develop new crop varieties that are adapted to current and evolving human needs, growing food demands and changing climatic and environmental conditions.

The International Treaty is a legally binding instrument with the objectives of facilitating the conservation and sustainable use of PGRFA and the fair and equitable sharing of benefits derived from their use, in harmony with the Convention on Biological Diversity (CBD). The Governing Body of the International Treaty has recognized the pivotal role of the conservation and sustainable use of PGRFA in addressing global challenges, including biodiversity loss, climate change, poverty and food insecurity, especially for smallholder and subsistence farmers. The implementation of Articles 5 and 6 of the International Treaty is a standing item on the agenda of the Governing Body of the International Treaty. At its Eighth Session, the Governing Body reaffirmed the key role of the conservation and sustainable use of PGRFA and decided to expand the scope of the tasks of the Ad Hoc Technical Committee on Sustainable Use of PGRFA (Committee) to include Conservation under Article 6.

Among the tasks assigned to it by the Governing Body, the Committee was requested to “recommend further steps on how the Governing Body can assist Contracting Parties in advancing the implementation of Articles 5 and 6 of the International Treaty for consideration of the Governing Body at its Ninth Session”. At its 5th meeting in October 2021, the Committee discussed a range of possible further steps to support Contracting Parties and stakeholders in the implementation of Articles 5 and 6 of the International Treaty. In considering the possible new initiatives, the Committee highlighted the opportunity to develop country-/region-specific studies to address the poor implementation of Articles 5 and 6 and the Secretariat prepared a *Background study on the bottlenecks and challenges to the implementation of Articles 5 and 6* (Background study).<sup>1</sup>

Keeping in mind that there is great diversity among and within the regions, the study has identified four main types of bottleneck to the conservation and use of PGRFA. The following sections provide a general overview of the types of bottleneck across the regions.

#### **- Legal, policy and institutional challenges**

A large majority of reporting countries across the regions have adopted laws, regulations, procedures or policies that specifically aim to implement the International Treaty, or that contribute generally to the conservation and sustainable use of PGRFA. These include ratification acts, seed regulations and legislation on plant variety protection, community

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<sup>1</sup> IT/GB-9/ACSU-5/21/Report. *Report of the Fifth meeting of the Ad Hoc Technical Committee on Conservation and Sustainable Use of Plant Genetic Resources for Food and Agriculture.*  
[www.fao.org/3/cb7136en/cb7136en.pdf](http://www.fao.org/3/cb7136en/cb7136en.pdf)

knowledge and community rights regulations, ABS regulations, phytosanitary legislation, agricultural policies, food safety laws, fauna and flora conservation and protection, forest laws and policies, national biodiversity strategy and action plans, biosafety frameworks and environmental regulations. A number of countries reported being in the process of revising their policies and legislation, particularly with regard to seed laws and ABS issues in the context of the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the CBD. At the same time, many countries in most regions have stressed the need to adopt general policies on PGRFA conservation and use, as well as specific legislation, for instance to recognize and support informal seed systems and the certification and marketing of landraces/farmers' varieties. Overwhelmingly, respondents highlighted farmers as the stakeholders who are not currently adequately supported by national policy in the sustainable use of PGRFA. Also frequently mentioned was the need to adopt an integrated approach to implementation of the International Treaty, the CBD and the Conventions of the International Union for the Protection of New Varieties of Plants (UPOV). Other issues raised across regions include limited intersectoral coordination and, in particular, a lack of coordination mechanisms among the public administrations involved, and/or between the public and industry sectors, as well as lack of implementation of the relevant laws, policies and strategies and low levels of awareness of the importance of the International Treaty, and of PGRFA in general.

#### **- Technical and scientific issues**

The long-term and secure conservation of PGRFA, either on-farm, *in situ* or *ex situ* in gene banks, ensures that it is available for sustainable use. In many countries, surveys, inventories and assessment of genetic erosion of PGRFA on-farm and *in situ* are lacking and systems of *ex situ* conservation are inefficient. The low level of scientific interest in specific types of crops, species and varieties with less commercial potential, including CWR, wild plant species, underutilized species and other non-economic and minor crops, poses a serious threat to their conservation. Although most survey respondents from most regions agree that an adequate range of PGR material is available for utilization in public research programmes on (pre-)breeding and/or conservation, as well as in commercial crop variety improvement programmes, difficulties in accessing plant genetic material for crop improvement, as well as in obtaining information associated with plant genetic material, were identified as important challenges by most stakeholders from all regions. Lack of characterization and evaluation data, especially for minor crops, landraces and wild species, is a particularly significant obstacle to greater use of PGRFA. Gaps in the sustainable use of PGRFA are generally greater than for conservation activities. For instance, very few countries and national programmes promote pre-breeding and PPB. At the same time, low or lack of access to molecular tools and advanced technologies remains an important challenge in most regions, including Africa, Asia, Latin America and the Caribbean, the Near East, and Southwest Pacific.

#### **- Seed distribution and marketing of landraces and farmers' crop varieties**

Access to sufficient quantities of seed of an adequate range of crop varieties is not straightforward for a large proportion of stakeholders across all regions. While sufficient quantities of seed for the main crops and commercial varieties are usually available, dependence on commercial seed and the promotion of crops and varieties with commercial value tend to restrict the amount of PGRFA that meet farmers' needs. Other reasons for problematic access to seed include the prohibitive cost of seeds for smallholder farmers; the limited quantities of seed in gene banks and the lack of systems for multiplication; lack of resources and skills, which hampers seed production; and the lack of an integrated system that facilitates access to farmers' seeds, while recognizing and protecting Farmers' Rights. Furthermore, inadequate marketing opportunities for landraces/farmers' crop varieties are a matter of serious concern in most regions. The main challenges relate to a lack of market

demand for minor crops, landraces and farmers' varieties, coupled with policy issues, including lack of enabling legislation and policies or poor implementation of existing laws and policies.

**- Resource constraints**

Human and institutional capacity building, as well as greater financial and material resources, are critically required to enable countries and stakeholders to effectively ensure the conservation and sustainable use of PGRFA. Across the regions, the highest capacity-building needs are in the use of novel characterization techniques to speed up the identification of target trait sources; the development/implementation of policy on conservation and sustainable use of PGRFA; and the promotion of market opportunities for landraces/farmers' varieties. If financial resources are generally required for all facets of the PGRFA conservation and use system, they are primarily needed to support gene banks, as well as to enhance on-farm and *in situ* conservation, strengthen seed systems, promote markets for landraces and farmers' varieties, conduct training activities and raise awareness. In some regions, poor infrastructure and lack of adequate equipment, including seed storage facilities, as well as lack of access to remote areas, are additional bottlenecks in the conservation and sustainable use of PGRFA.

## 4. METHODOLOGY

### *Data collection*

The primary sources of information for the data analysis are the National Reports on implementation of the International Treaty (hereafter, national reports) that are submitted by Contracting Parties in accordance with the Compliance procedures of the International Treaty. Since May 2016, the Secretariat of the International Treaty has received 79 national reports for a total of 149 Contracting Parties, hence 53 percent of Contracting Parties have submitted a national report, including:

- 19 national reports out of a total of 49 Contracting Parties from the Africa region (about 39 percent of Contracting Parties for this region);
- 11 national reports out of a total of 25 Contracting Parties from the Asia Region (44 percent of Contracting Parties for this region);
- 21 national reports out of a total of 48 Contracting Parties, excluding the European Union, from the Europe region (about 44 percent of Contracting Parties for this region);
- 14 national reports out of a total of 33 Contracting Parties from the Latin America and Caribbean Region (about 42 percent of Contracting Parties for this region);
- 8 national reports out of a total of 21 Contracting Parties from the Near East Region (about 38 percent of Contracting Parties for this region);
- 2 national reports out of a total of 2 Contracting Parties from the North America Region (100 percent of Contracting Parties for this region); and
- 4 national reports out of a total of 16 Contracting Parties from the Southwest Pacific Region (25 percent of Contracting Parties for this region).<sup>2</sup>

For each of the main articles of the International Treaty, the national reports comprise mandatory questions (e.g. yes/no and multiple choice questions) and optional questions, for which respondents are requested to either substantiate their answers or to provide additional details. For the purpose of this background study, the data collection process focused primarily on the information provided under the following thematic areas:

- General obligations (Article 4);
- Conservation, exploration, collection, characterization, evaluation and documentation of plant genetic resources for food and agriculture (Article 5);
- Sustainable use of plant genetic resources for food and agriculture (Article 6);
- National commitments and international cooperation (Article 7);
- General remarks on implementation of the International Treaty.

Other sources include:

- The outcomes of the regional webinars on the Benefit-sharing Fund (BSF), Farmers' Rights and Conservation and Sustainable Use of PGRFA organized by the Secretariat in all regions in early 2022: (i) Africa, 25 January 2022; (ii) Asia and Southwest Pacific, 26 January 2022; (iii) Latin America and the Caribbean, 27 January 2022; (iv) Near East and North Africa, 28 January 2022; (v) Europe, 2 February 2022; and (vi) North America, 3 February 2022.
- The outcomes of the three regional training workshops on conservation and sustainable use of PGRFA and Farmers' Rights organized by the Secretariat in the following regions in 2019: (i) Asia Region, held in Manila, the Philippines, from 5 to 8 March 2019; (ii) Africa Region, held in Dakar, Senegal, from 29 July to 1 August 2019; and (iii) Latin America and the Caribbean Region, held in Montevideo, Uruguay, from 5 to 8 August 2019.
- Results of the global survey conducted in 2015 by the Secretariat of the International Treaty on the SurveyMonkey platform to gather the views and needs of PGRFA stakeholders on

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<sup>2</sup> The basis used for the classification of the countries in the region groupings is the list of Contracting Parties on the International Treaty website: [www.fao.org/plant-treaty/countries/membership/en/](http://www.fao.org/plant-treaty/countries/membership/en/)

bottlenecks in the PGRFA use system.<sup>3</sup> The stakeholder survey comprised the following four sections, including both mandatory (e.g. multiple choice and ranking) and optional questions, for which respondents were requested to either substantiate their answers or to provide additional details: 1) Stakeholder identification; 2) Strengths and weaknesses of the current PGRFA use system; 3) Constraints and needs regarding the implementation of PGRFA sustainable use strategies; and 4) Types and contents of resources required in the Toolbox. For the purpose of this background study, the data collection process focused on the information provided under the first three sections of the survey. In addition, to ensure consistency, this study only considered answers provided by respondents who completed the entire survey (185 out of a total of 392 respondents), including:

- (i) 21 respondents from 15 countries in Africa;
- (ii) 24 respondents from 11 countries in Asia;
- (iii) 91 respondents from 29 countries in Europe;
- (iv) 8 respondents from 6 countries in Latin America and the Caribbean;
- (v) 12 respondents from 7 countries in the Near East;
- (vi) 12 respondents from 2 countries in North America;
- (vii) 17 respondents from 10 countries in Southwest Pacific.

- Other documents and studies, including the Plant Genetic Resources Strategy for Europe (hereafter, PGR Strategy) launched by the European Cooperative Programme for Plant Genetic Resources (ECPGR) on 30 November 2021.

### ***Data analysis***

The data collected from the national reports and the global survey were organized into tables in MS Excel by country and combined by region into seven separate databases for each of the seven regions, i.e. Africa, Asia, Europe, Latin America and the Caribbean, Near East, North Africa, and Southwest Pacific, in preparation for data analysis. Answers to all mandatory questions (e.g. yes/no, multiple choice and ranking) were filtered in MS Excel to calculate percentages and the results are presented in bar and pie charts and/or in the narrative. Free-text responses to optional questions of both national reports and the global survey were ordered thematically and presented in tabular format (as supplementary tables). Syntheses of the key issues arising from these optional responses, as well as from the outcomes of the regional webinars organized by the Secretariat in all regions in early 2022, and from the outcomes of the three regional training workshops organized by the Secretariat in 2019, are presented in the narrative.

For clarity, the study refers to ‘country(ies)’ and ‘national reports’ when the information was collected from the national reports; and to ‘stakeholders’ or ‘respondents’ when the information was collected from the answers to the global survey.

### ***Limitations***

The study has two main limitations. First, there are substantial differences in the number of national reports and completed survey questionnaires submitted across the regions. In addition, due to the fact that the global survey focused on the bottlenecks in the PGRFA use system, a comparatively smaller amount of data and information is available on the challenges to conservation of PGRFA.

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<sup>3</sup> [www.surveymonkey.com](http://www.surveymonkey.com)

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The outcomes of the regional webinars organized by the Secretariat in all regions in early 2022, as well as the outcomes of the three regional training workshops organized by the Secretariat in 2019, were particularly useful in addressing these limitations.

## 5. REGIONAL ANALYSIS

### 5.1. Africa

#### 5.1.1 Legal and policy issues

In Africa, the lack of legislation, policies, incentive instruments and/or national programmes specifically dedicated to the conservation and use of PGRFA was described by some countries as a major factor constraining the prioritization of, and allocation of budget towards PGRFA activities or programmes. More specifically, in relation to the sustainable use of PGRFA, most reporting countries and stakeholders highlighted the lack of an enabling, efficient and/or comprehensive legal and policy framework. For instance, more than half of the survey respondents from Africa reported that no policy has been adopted to promote farmer innovation in plant breeding; about 40 percent of them consider that standards and certification procedures are unclear, complicated and too costly for farmers; and over 25 percent of reporting countries do not have seed legislation that covers the sale of traditional seeds and/or recognizes farmers' varieties and informal seed systems.

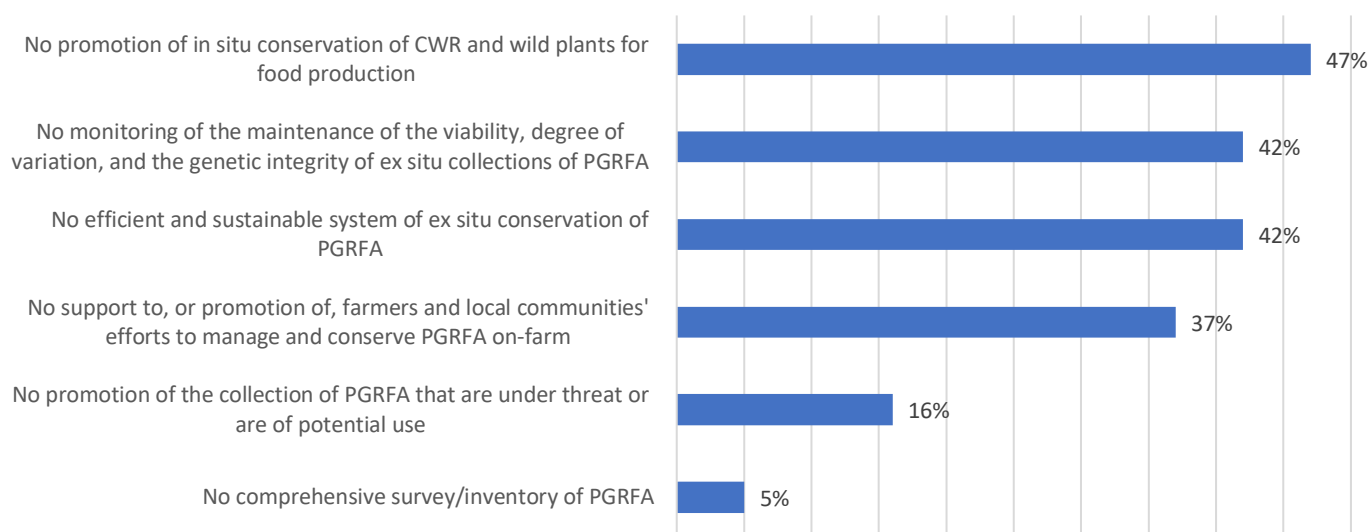
The efficiency of the national legal and policy framework in support of the conservation and sustainable use of PGRFA is further hindered by implementation, coordination and awareness-raising issues. Half of the reporting countries from Africa noted the low implementation of the relevant laws, policies and strategies and a high percentage of stakeholders reported that there are insufficient incentives (over 52 percent of respondents), guidance (almost 48 percent of respondents) and financial resources (almost 48 percent of respondents) to implement the national policy effectively. Lack of coordination mechanisms among the public administrations involved in the implementation of national policies, and between the public and industry sectors, and a lack of awareness of the importance of the International Treaty and of PGRFA in general, are additional bottlenecks to implementation of the relevant laws and policies.

#### 5.1.2 Technical and scientific issues

According to a number of countries and survey respondents from Africa, there are no or very limited numbers of surveys, inventories and characterization activities. Conservation of PGRFA was found to be challenging in some countries due to the lack of a comprehensive national PGRFA inventory system, as well as the absence of an efficient and sustainable system of *ex situ* conservation at national level. Molecular characterization and field trials are critically needed in some countries to ensure the sustainable *ex situ* conservation of PGRFA. However, in this region, there is a lack of access to recent technologies for information management in general, and a lack of characterization and germplasm processing tools in particular. Figure 1.1 provides information on the type of activities lacking for the conservation of PGRFA in Africa.



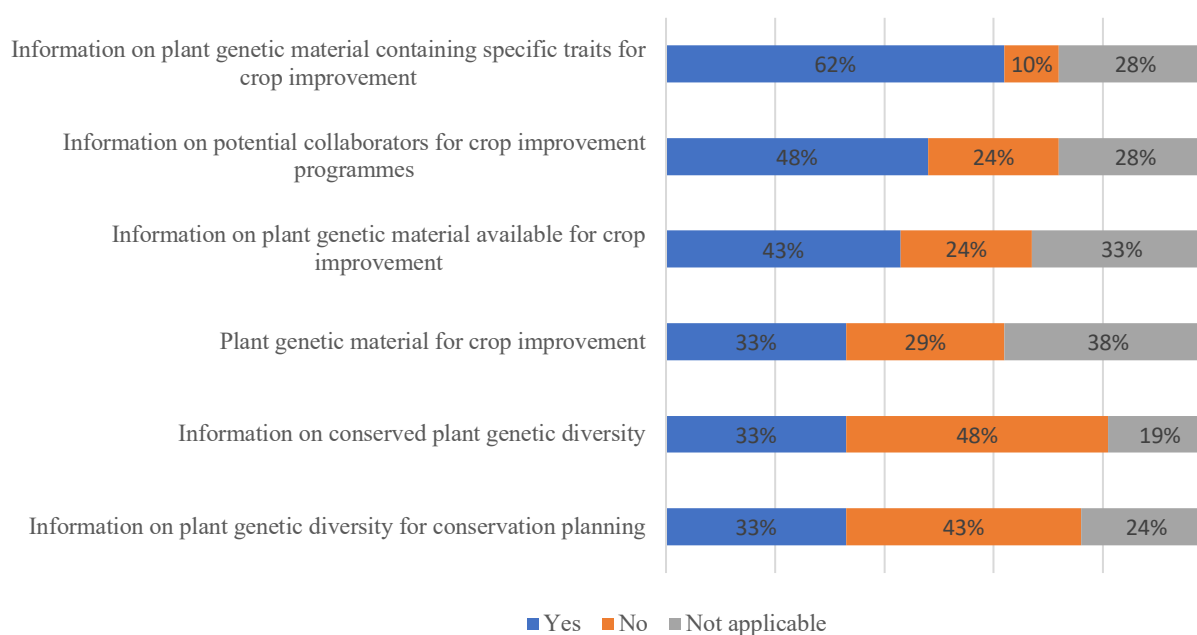
**Figure 1.1**  
**Gaps in the conservation of PGRFA in Africa**  
 (% of reporting countries - n = 19)



The gaps in collections, especially with regard to CWR, landraces, millet, sorghum, and indigenous fruits and vegetables, are important bottlenecks to the use of PGRFA. About one-third of survey respondents from Africa reported difficulties in gaining access to plant genetic material for use in commercial improvement programmes or in public research programmes on (pre-)breeding and/or conservation.

In addition to the lack of characterization data for a large range of genetic material conserved in gene banks, which results in these resources not being readily available for research, the survey respondents highlighted complicated, time-consuming and costly procedures for accessing material, particularly within the public gene bank system. More specifically, with regard to pre-breeding, the fact that research programmes in some countries focus on the evaluation and adaptation of improved materials that are imported from abroad precludes the use of local material in pre-breeding programmes. Many stakeholders pointed to the lack of research on specific traits, especially those useful for climate-, nutritional- and medicinal-related stress and, generally speaking, to a lack of human resources and expertise to identify the genes or traits of interest, which contributes to the paucity of data and information. Furthermore, about half of survey respondents from Africa reported difficulties in obtaining information on potential collaborators for crop improvement programmes; some stakeholders even mentioned a lack of collaborators within their country.

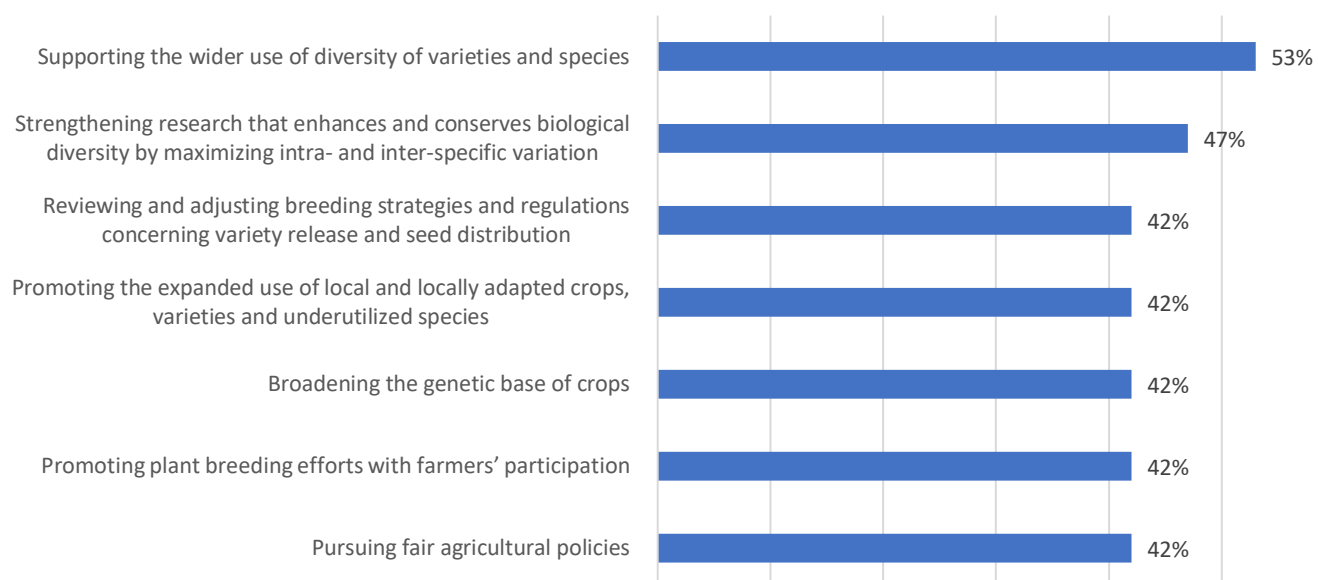
**Figure 1.2**  
**Constraints regarding access to PGRFA material (germplasm) or related information required for sustainable use in Africa (n = 21)**



#### **Difficulties in obtaining:**

Some survey respondents reported that no public research has been carried out on breeding and that there is no private breeding company in the country(ies) where they work. The lack of scientific interest and activities in farmers' varieties, traditional crops and neglected species, such as millet, sorghum, landraces and indigenous fruits and vegetables, also poses a major challenge in some countries. Generally speaking, the efficiency of the PGRFA use system in this region is hampered by gaps in the policy framework, especially for supporting the wider use of diversity of varieties and species and for strengthening research that enhances and conserves biological diversity by maximizing intra- and inter-specific variation.

**Figure 1.3**  
**Gaps in the sustainable use of PGRFA in Africa with regard to policy/legal measures for**  
**(% of reporting countries - n = 19)**



### 5.1.3 Seed distribution and marketing of landraces and farmers' crop varieties

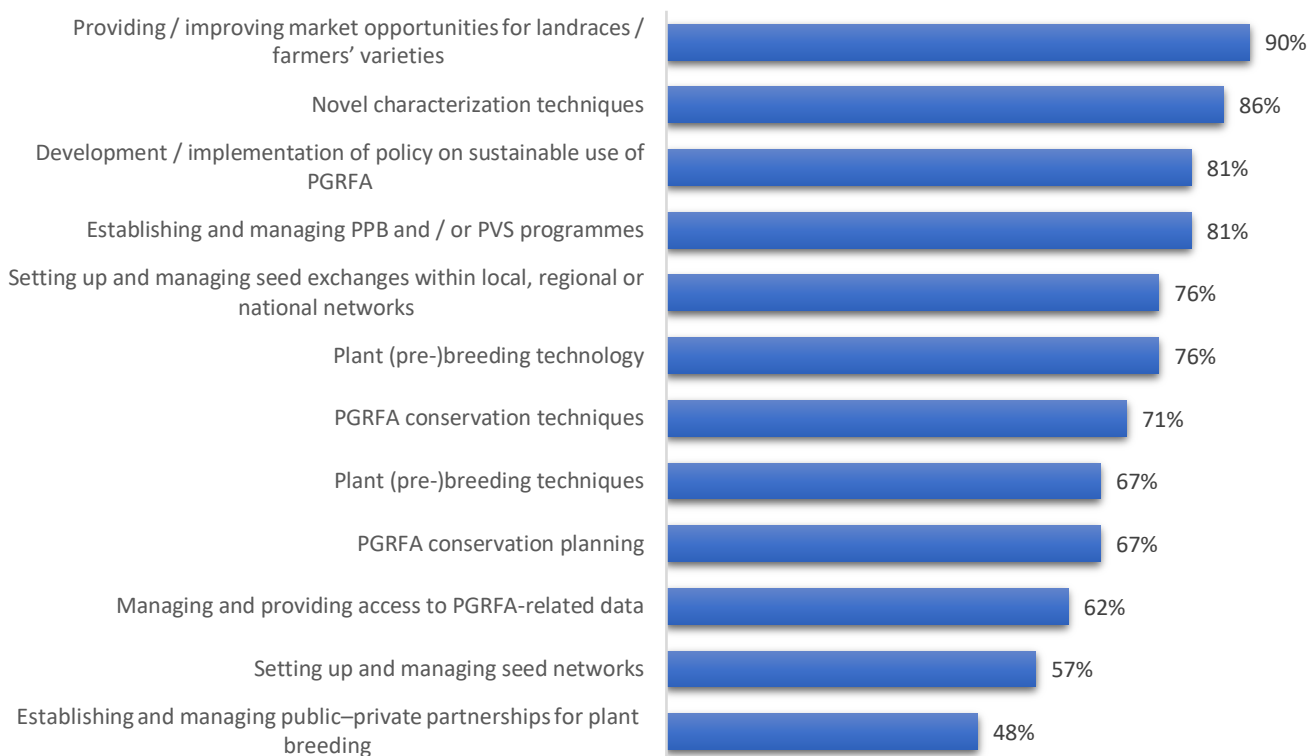
Nearly half of survey respondents from Africa reported difficulties in accessing sufficient quantities of seed of an adequate range of crop varieties, primarily because: smallholder farmers are restricted by the cost of seed and the distribution channels; the informal seed supply system is placed under pressure due to agricultural modernization and increased emphasis on the use of improved crops and varieties; and there is no integrated system that facilitates access to farmers' seeds while recognizing and protecting Farmers' Rights. In addition, as in many other regions, minor crops and farmers' varieties with less commercial potential have been neglected in breeding. As a result, the varieties available do not meet farmers' needs. Furthermore, in some countries, quantities of seed in gene banks are limited; systems for multiplication are lacking; and while there might be a shortage of planting materials, the seed production and supply systems may not be operational or sustainable. In some countries, access is also restricted due to logistical issues in remote areas. In addition, the lack of market demand for minor crops, landraces and farmers' varieties is a serious issue in some countries. Most survey respondents from this region consider that marketing opportunities for landraces and farmers' crop varieties do not exist, which helps to explain why they remain underutilized and neglected. For other stakeholders, although there may be adequate marketing opportunities for landraces, there is a lack of support for structuring the supply chains efficiently. Lack of research interest in minor crops, landraces and farmers' varieties, coupled with the lack of a market structure, are two key challenges.

### 5.1.4 Resource constraints

In Africa, there is a general lack of technical capacities and human resources, including for the collection, characterization, evaluation, documentation, regeneration and use of modern technologies in plant breeding. As shown in the following graphic, the highest priorities identified by the survey respondents from this region in terms of capacity-building needs are related to providing/improving market opportunities for landraces/farmers' varieties, novel characterization techniques, and sustainable use policy development/implementation. In this regard, one important challenge for a number of countries from this region to developing and implementing the relevant policies and strategies is the lack of legal understanding and

qualified human resources in legal and policy aspects. The need to build capacities in ecological and social modeling and in project writing in the context of the BSF – two areas that were not among the pre-defined categories of capacity-building needs of the global survey – were also highlighted by stakeholders from this region.

**Figure 1.4**  
**Capacity-building needs reported by stakeholders in Africa (n = 21)**



A number of countries and stakeholders from this region also observed that a lack of resources hinders: the sustainability of policies, programmes and activities for conservation and use of PGRFA; the application of research findings, especially with farmers for on-farm and *in situ* conservation; the establishment of community seed banks; and the functioning of gene banks, among others. Physical constraints include lack of electricity, leading to the loss of germplasm in *ex situ* collections; lack of equipment, including for storage facilities and seed; the overall poor operation of gene banks; and lack of access to remote areas to conduct inventories. In this region, financial resources are urgently needed to conduct: inventories and prospection; on-farm conservation; community-based seed security; characterization and pre-breeding; gene bank management; enhancement of landrace crop varieties, including promotion of such varieties and derived products; plant breeding; education and awareness-raising on the basic fundamentals of PGRFA conservation and sustainable use; training activities; policy reform; and marketing of farmers' varieties, among others. In addition, the promotion of solar-powered seed gene banks was suggested as a way of addressing the perennial power outages.

## 5.2 Asia

### 5.2.1 Legal and policy issues

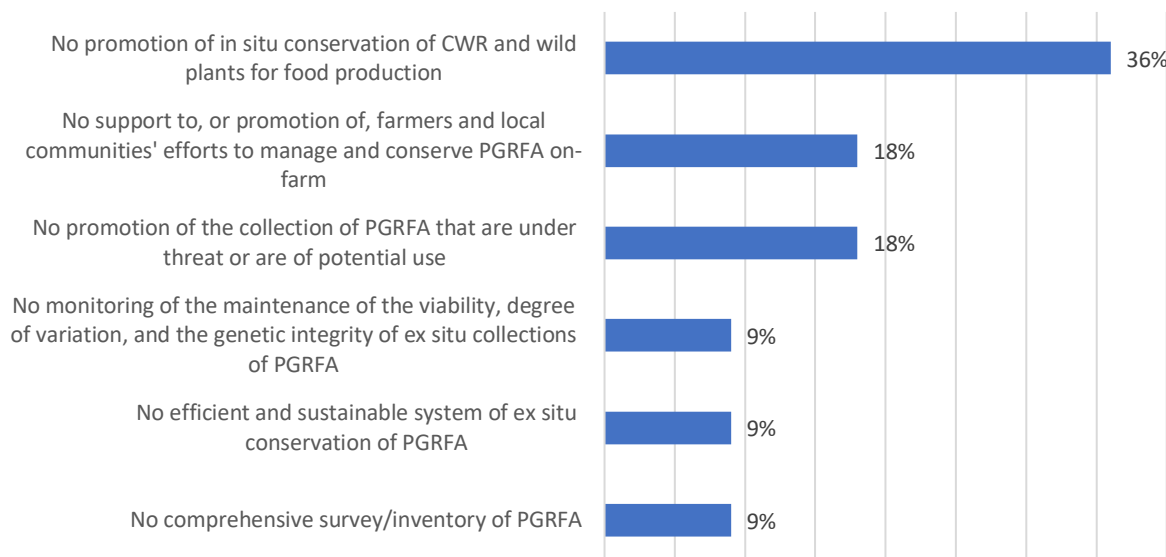
Although all reporting countries from Asia have adopted laws, regulations, procedures or policies for all or some of the facets of the PGRFA conservation and use system, more than 60 percent of stakeholders consider that the policy and legal measures in place to promote the sustainable use of PGRFA do not cover all the elements of use of PGRFA and/or there are problems with their implementation. For example, over 20 percent of respondents consider that policies are not in place to promote farmer innovation in plant breeding. In addition, more than one-quarter of reporting countries from Asia highlighted difficulties in implementing laws, policies and strategies pertaining to the conservation and sustainable use of PGRFA because these are ill-conceived and short-sighted, and/or due to the lack of human, technical and financial resources, as well as limited intersectoral coordination. Many survey respondents from Asia consider there to be a lack of coordination mechanisms among the public administrations involved (46 percent of respondents) and between the public and industry sectors (33 percent of respondents). The coordination of large programmes involving many actors from various sectors, including agriculture, forestry, commerce, industry and education, as well as the mediation of different, sometimes conflicting, interests among stakeholders – especially in the private sector – was identified as particularly challenging. In one country, *ex situ* conservation of PGRFA is limited to institutional initiatives and is project-based only, which is another important factor limiting the sustainable conservation of *ex situ* collections. Furthermore, many countries in Asia stressed a lack of awareness of the importance of PGRFA and the International Treaty.

### 5.2.2 Technical and scientific issues

In Asia, some countries highlighted a lack of activities in specific types of crops and varieties, including CWR, non-economic and minor crops. For instance, in one country, low priority is given to the threat assessment of CWR and there is a lack of taxonomic expertise, particularly in CWR germplasm collection. Another country indicated that conservation activities were mainly focused on major crop plants, including rice and selected fruit varieties, and that there was minimal research on genetic diversity of minor crops. The fact that the formal education system in agriculture and food sciences promotes modern varieties and technologies was flagged as a factor contributing to the general lack of awareness and understanding of the importance of traditional, non-economic and minor crops. Additionally, although almost all countries from the region reported monitoring the maintenance of the viability, degree of variation, and genetic integrity of *ex situ* collections of PGRFA, technical difficulties associated with the maintenance of genetic diversity, especially in vegetative plant propagation, and with access to, and use of, molecular tools, were noted. Additional constraints are the lack of adequate public research programmes and difficulties in attracting scientists in the field of genetics and conservation to work in remote areas.

Figure 2.2 provides information on the type of activities lacking for the conservation of PGRFA in Asia.

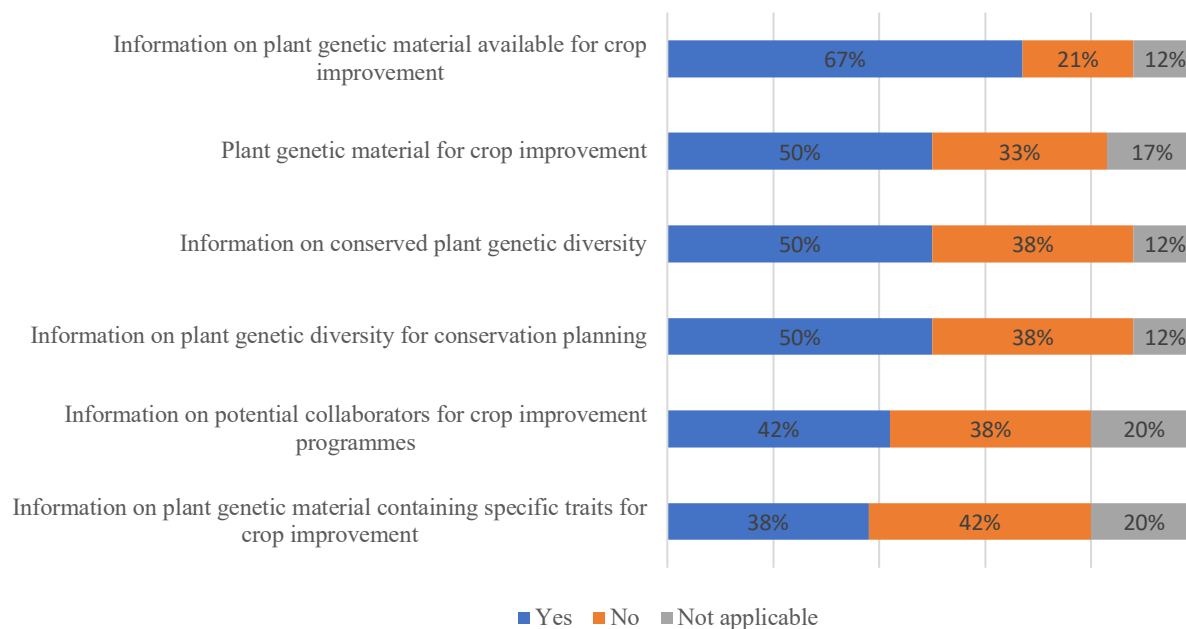
**Figure 2.1**  
**Gaps in the conservation of PGRFA in Asia**  
 (% of reporting countries - n = 11)



In this region, an adequate range of plant genetic material for staple crops is generally available for utilization, except with regard to plant genetic material of underutilized crops, CWR, vegetables and other field crops, while the availability of plant genetic material may vary across different geographical regions within the same country and between countries. Half of the survey respondents from Asia emphasized difficulties in obtaining plant genetic material for crop improvement. A variety of reasons explain why access to plant genetic material is not straightforward. For instance, stakeholders highlighted the gaps in *ex situ* collection coverage, especially with regard to underutilized crops and CWR; a lack of characterization and evaluation of material; the complexity of procedures; lack of common policies and harmonized guidelines between different governmental agencies; and restrictions imposed by government regulations. In addition, private seed companies may only access plant genetic materials from national gene banks very occasionally because they are cautious about potential future claims on royalties due to intellectual property rights (IPRs) and ABS regulations. Access to information associated with PGR was also found to be problematic for a high proportion of survey respondents from this region, especially with regard to information on plant genetic material available for crop improvement.

**Figure 2.2**  
**Constraints regarding access to PGRFA material (germplasm) or related information required for sustainable use in Asia (n = 24)**

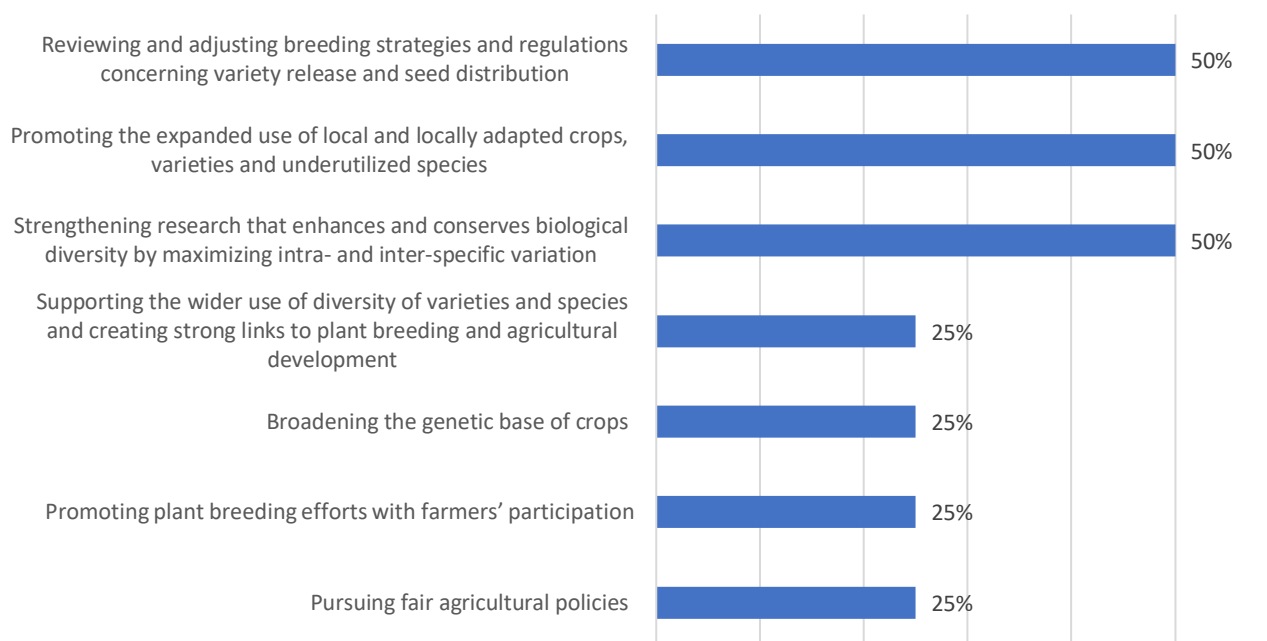
**Difficulties in obtaining:**



The main obstacles cited by stakeholders from this region are inadequate data management in national gene banks and government agencies; lack of publicly available operational online databases, including at national level; lack of information on material containing specific traits; the limited number of studies on plant genetic diversity; poor communication technology; and lack of skilled human resources.

The PGRFA use system is further undermined by gaps in the policy framework. In this region, policies are particularly lacking for reviewing and adjusting breeding strategies and regulations concerning variety release and seed distribution; promoting the expanded use of local and locally adapted crops, varieties and underutilized species; and strengthening research that enhances and conserves biological diversity.

**Figure 2.3**  
**Gaps in the sustainable use of PGRFA in Asia with regard to policy/legal measures for**  
**(% of reporting countries - n = 11)**



### 5.2.3 Seed distribution and marketing of landraces and farmers' crop varieties

For about one-third of stakeholders from Asia, gaining access to sufficient quantities of seed of an adequate range of crop varieties is problematic because information held in national gene banks is not transparent and is often inaccessible to the public; quantities of seed in gene banks are limited; and systems for multiplication are lacking. In addition, while there is a good supply and distribution of rice seeds, access is more difficult for underutilized crops such as indigenous vegetables, as well as hybrid coconut seedlings, for which producers' low capacities cannot match the high demand. Furthermore, there is no integrated system that facilitates access to farmers' seeds, while recognizing and protecting Farmers' Rights, and the distribution process is highly complicated. Inappropriate policies, laws and regulations also weaken the farmer seed systems.

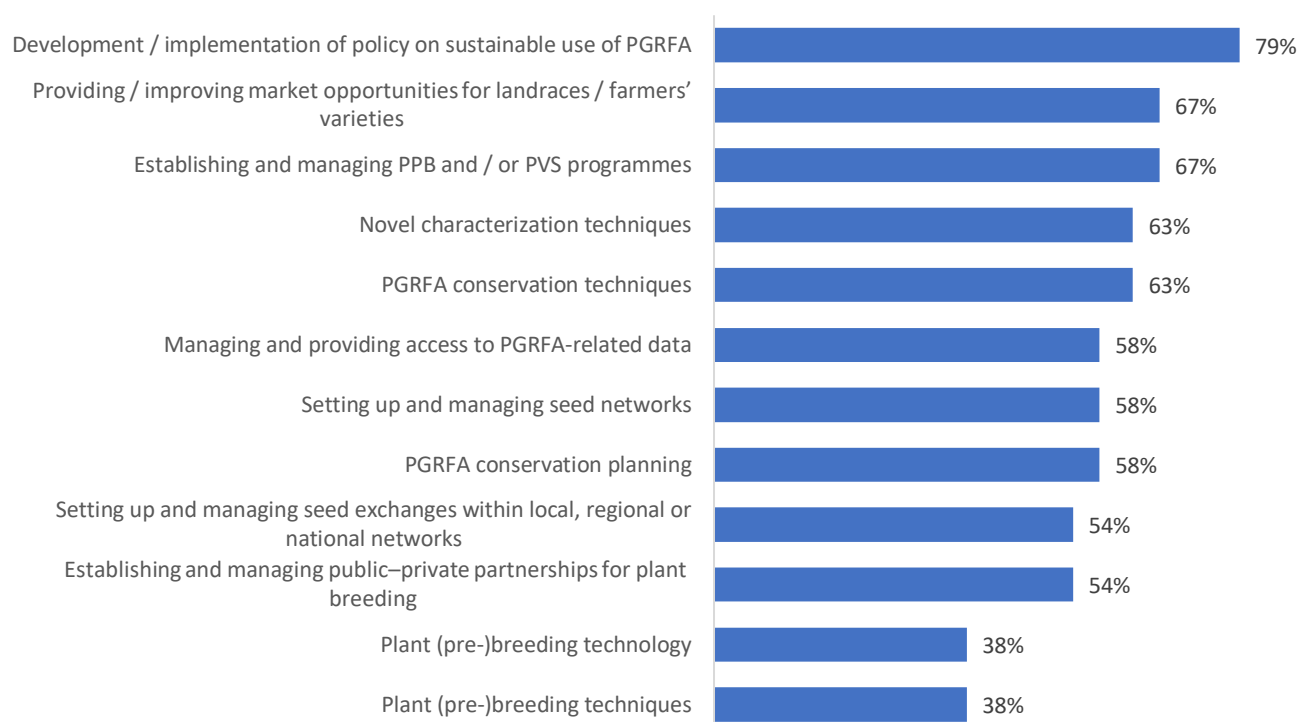
In this region, changes in food habits, coupled with the availability of cheaper alternatives from abroad and the current emphasis on the production, marketing and consumption of high-value crops, are bottlenecks to the promotion and marketing of landraces and indigenous and farmers' crops. While indigenous crops are still being conserved, grown and consumed in many remote areas, many of them have been replaced by commercial modern varieties. Marketing opportunities, when they exist, are not being promoted adequately and farmers do not always know where to sell their products in the absence of market studies for landraces and farmers' varieties. Moreover, policies to support marketing of landraces and farmers' varieties are not properly implemented, and there is insufficient awareness of the advantages and health and nutritional benefits of indigenous and traditional varieties.

### 5.2.4 Resource constraints

According to the survey respondents from Asia, capacity building in this region is primarily needed for sustainable use policy development/implementation, providing/improving market opportunities for landraces/farmers' varieties, and establishing and managing PPB and/or PVS programmes.



**Figure 2.4**  
**Capacity-building needs reported by stakeholders in Asia (n = 24)**



In this region, some countries reported physical and operational constraints, including a lack of adequate and secure facilities, such as cold rooms for seed storage and research facilities; and lack of access to remote areas. Financial resources are particularly needed to provide long-term support for national gene banks, including for the characterization and evaluation of PGRFA; for on-farm and *in situ* conservation, especially for CWR, indigenous and underutilized crops; and for the implementation of targeted programmes that engage smallholder farmers and provide them with technical and financial support as start-up resources.

## 5.3 Europe

### 5.3.1 Legal and policy issues

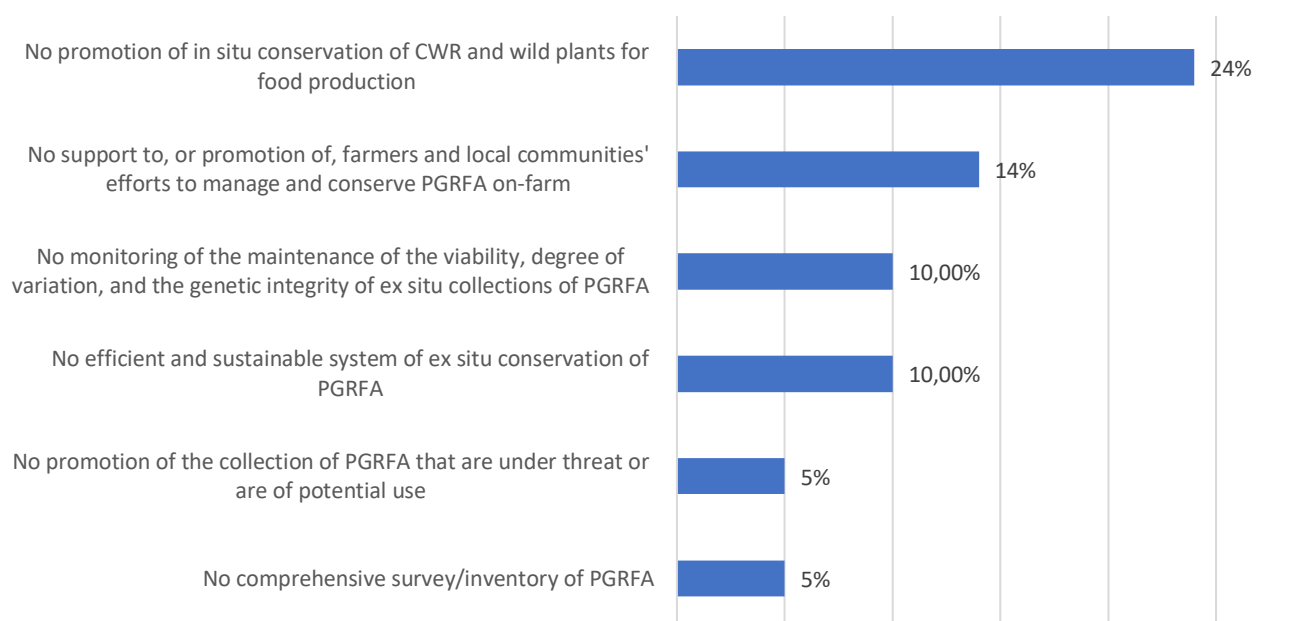
In Europe, a few countries and survey respondents reported a lack of legislation, programme or strategy in all or specific aspects of conservation and use of PGRFA. For instance, gaps can be found in the national policy framework to support on-farm and *in situ* conservation of heritage cultivars, CWR and landraces, and their use in plant breeding. In one country, the national strategy on biodiversity does not provide for specific objectives for *in situ* conservation of PGRFA which, as a result, has been carried out through passive protection only, especially in the case of CWR. Lack of policies supporting the collections of universities was also highlighted. In relation to sustainable use of PGRFA, 60 percent of survey respondents from that region believe that the existing national policy framework in support of sustainable use has limitations. For instance, almost 50 percent of survey respondents from this region report that there is no policy to promote farmer innovation in plant breeding in the country(ies) where they work; over one-third of survey respondents do not believe that standards and procedures for crop variety certification have a positive impact on the range of PGRFA available for cultivation and marketing; and restrictive seed regulations authorize the use of landraces for own consumption only and do not support the informal seed sector and/or PPB.

Several European countries and stakeholders reported a lack of interinstitutional and intersectoral coordination: (a) among public administrations, especially those responsible for agriculture and environmental matters; (b) between the public and industry sectors; and (c) between public administrations and the regional authorities that are involved in conservation policies, where relevant. For instance, in one country, there is no coordination of activities for *in situ* conservation of CWR at the national level, except for inventorying. Even in countries where multistakeholder platforms are in place, some actors may not be involved, especially private seed producers and breeding companies. It should be noted that, at the European level, the PGR Strategy recommends establishing a coherent European policy framework, which would require, among others: (a) reviewing the EU PGR policy and legislative landscape; (b) establishing a coherent European legal framework; and (c) developing and implementing coherent national conservation and use action plans in each European country.

### 5.3.2 Technical and scientific issues

In Europe, according to the ECPGR, *in situ* CWR and WFP conservation has been neglected, mainly due to low awareness of the economic and environmental gains that their useful traits can bring to agriculture. There is also an inadequate comprehensive overview of on-farm PGRFA, while on-farm landraces are being increasingly replaced by new commercial varieties. In some countries, the lack of a system, mechanism or strategy for the evaluation of factors that contribute to the genetic erosion of PGRFA also hinders the identification of corrective measures. In addition, according to the ECPGR, there are wide variations in the quality and efficiency of *ex situ* conservation across the European region. Some survey respondents report that there is currently no efficient national system for *ex situ* conservation of PGRFA in the country(ies) in which they work. At the same time, some countries have pointed to the lack of identified collections for some crop species, while the sustainability of other collections is not guaranteed because their management is only supported by a single entity. In some countries, accessions of existing *ex situ* collections are not fully characterized and evaluated, especially for minor crops, landraces and wild species. Figure 3.1 provides information on the type of activities lacking for the conservation of PGRFA in Europe.

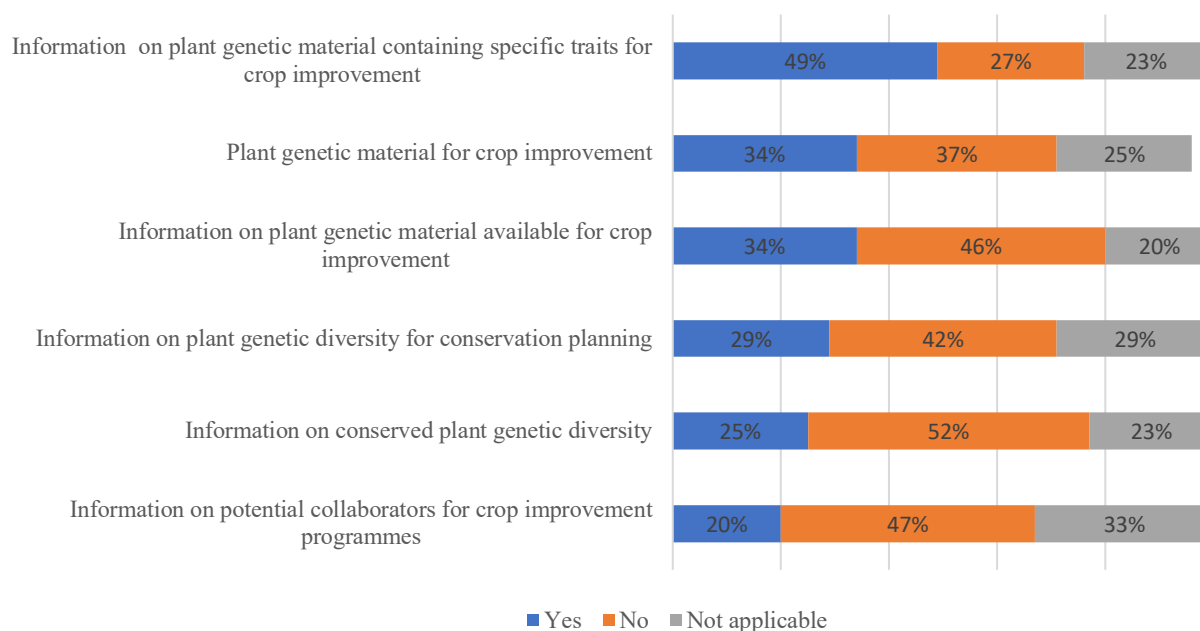
**Figure 3.1**  
**Gaps in the conservation of PGRFA in Europe**  
 (% of reporting countries - n = 21)



About one-quarter of the survey respondents from this region reported difficulties in obtaining plant genetic material for crop improvement, with some stakeholders mentioning specific complications in relation to accessing grapevine genetic resources. Reasons for this primarily centre on the lack of characterization and evaluation data for traditional crops, CWR and wild species, which leads to material not being readily available for research and targeted breeding programmes and result in the material being underutilized and/or inadequately conserved. The poor operation of, and lack of coordination among gene banks, coupled with complex and time-consuming procedures, which limit the availability of genetic resources from other countries, are also considered important bottlenecks. For instance, material requests may not be honoured, or there is confusion regarding operation of the Multilateral System, or a lack of human resources and adequate material in some gene banks limits the distribution of genetic material. Other important challenges are the fragmentation of policies and conservation facilities; compliance with national ABS regulations; and conflicts between national and international policies (such as MTA, IPRs and Farmers' Rights). In this respect, difficulties in determining which rules apply, in particular with regard to ABS obligations, and in having legal certainty on the conditions of use, are factors that slow the use of PGRFA. Some stakeholders also highlighted the lack of funding available for pre-breeding in public research programmes, which hinders the inclusion of an adequate and suitable range of accessions for introgression breeding.

Figure 3.2 shows that constraints to accessing PGRFA-related data and information are particularly significant in Europe with regard to information on material containing specific traits for crop improvement.

**Figure 3.2**  
**Constraints regarding access to PGRFA material (germplasm) or related information required for sustainable use in Europe (n = 91)**



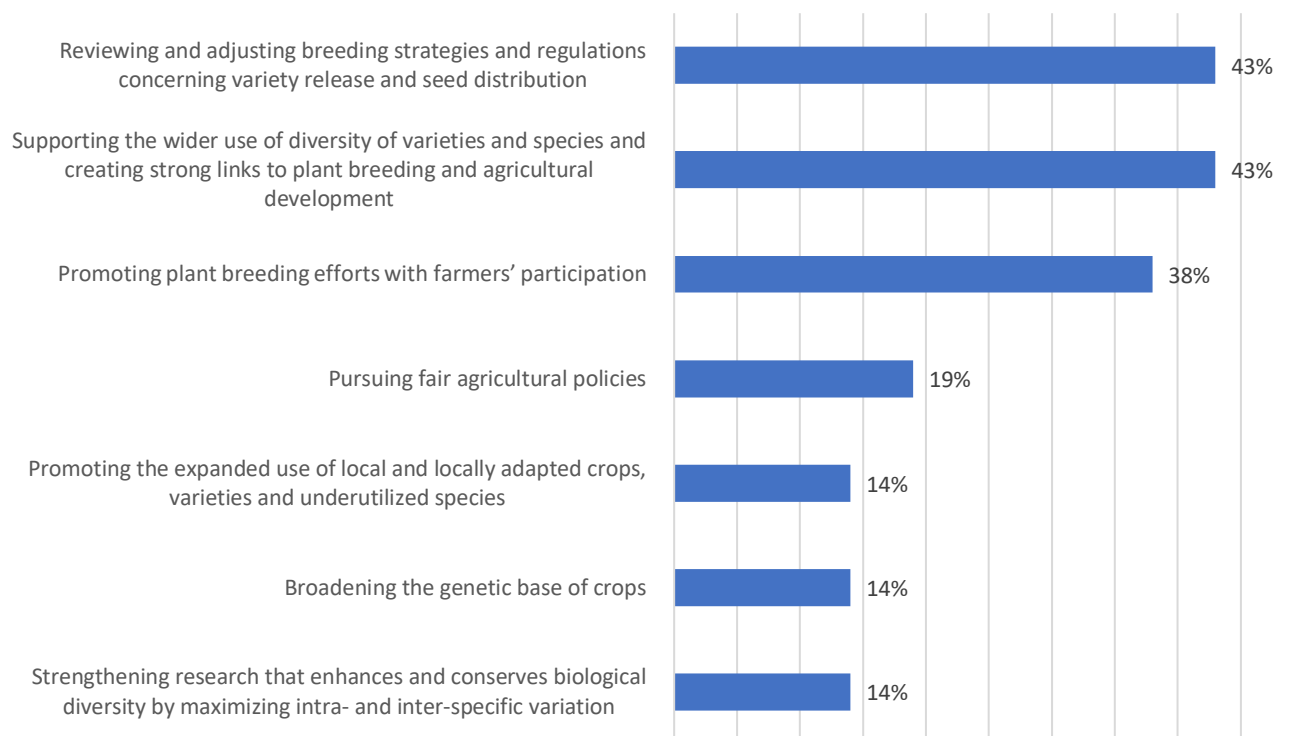
#### Difficulties in obtaining:

Difficulties in accessing adequate information, documentation and comprehensive national catalogues may relate, for instance, to the incompleteness of information on the status of PGRFA; lack of systematic inventorying of CWR and scarcity of information on the genetic variability of wild populations; the fact that no national inventory of *ex situ* collections of PGRFA has been made publicly available; incompleteness of the characterization and evaluation of national collections, especially for minor crops; difficulties in coordinating collections and naming systems at international level, especially with regard to wheat accessions and fruit crops; and the fact that information on genetic diversity and genetic resources available for crop improvement programmes aimed at enhancing resilience and adaptation to climate change and biofuel production is very restricted. Other challenges are the fragmentation of collections and a lack of integrated national information systems or online databases on germplasm holdings. Also highlighted was complicated access to information for purposes other than for conservation and crop improvement programmes, such as for direct use on the fields by small-scale farmers and seed producers, non-governmental organizations and seed networks. In addition, difficulties in identifying the right contacts involved in crop improvement programmes, in determining the timelines and procedures, and in obtaining the correct legal information to access the plant genetic material, are challenges, as are language barriers, lack of human resources and restricted access to scientific literature.

Generally speaking, countries from Europe expressed the need to position the utilization of PGRFA higher on the agenda and to focus attention on the implementation of Article 6 of the International Treaty. In this region, stakeholders stressed the lack of pre-breeding and the limited public breeding programmes available in the country(ies) where they work, while minor crops with less commercial potential have been generally neglected in plant breeding. Policies for reviewing and adjusting breeding strategies and for supporting the wider use of diversity of varieties and species and creating strong links to plant breeding and agricultural development are particularly lacking. Furthermore, very few national programmes promote

PPB, and interactions between public institutions and farmers for the purpose of PVS are almost non-existent in some European countries, partly due to the lack of enabling policy.

**Figure 3.3**  
**Gaps in the sustainable use of PGRFA in Europe with regard to policy/legal measures for**  
**(% of reporting countries - n = 21)**



It is noteworthy that, at the European level, the PGR Strategy aims, by 2030, to achieve the following targets: (a) expanded *in situ* conservation of CWR and WFP; (b) improved and promoted on-farm European PGR conservation and management; (c) consolidated and sustained European *ex situ* PGR conservation; (d) promoted sustainable use of European PGR; (v) a strengthened germplasm information system that supports better conservation and use of European PGR; and (vi) monitored progress in PGR conservation and use.

### 5.3.3 Seed distribution and marketing of landraces and farmers' crop varieties

In Europe, more than 25 percent of survey respondents identified complications with gaining access to sufficient quantities of seed of an adequate range of crop varieties. In this region, depending on the countries, quantities of seed in gene banks may be limited and is rarely available for distribution due to lack of communication between the conservation and production sectors; the limited reproduction capacity of institutions; lack of systems for multiplication; and weak capacities for regeneration of the accessions, which delay the response time to requests for seeds of gene bank materials, among others. In addition, as in other regions, while sufficient quantities of seed for the main crops and commercial varieties are usually available, landraces and minor crops with less commercial potential have been neglected in breeding programmes and the available varieties do not therefore meet the needs of farmers. Furthermore, in some countries there is no integrated and effective system that facilitates access to farmers' seeds, and/or the seed distribution systems are inadequate, while smallholder farmers are restricted by the cost of seeds, especially commercial ones. Finally, in some countries, many varieties are not available on local markets. For instance, in one country, although endangered species are included in a special type of on-farm conservation, there is

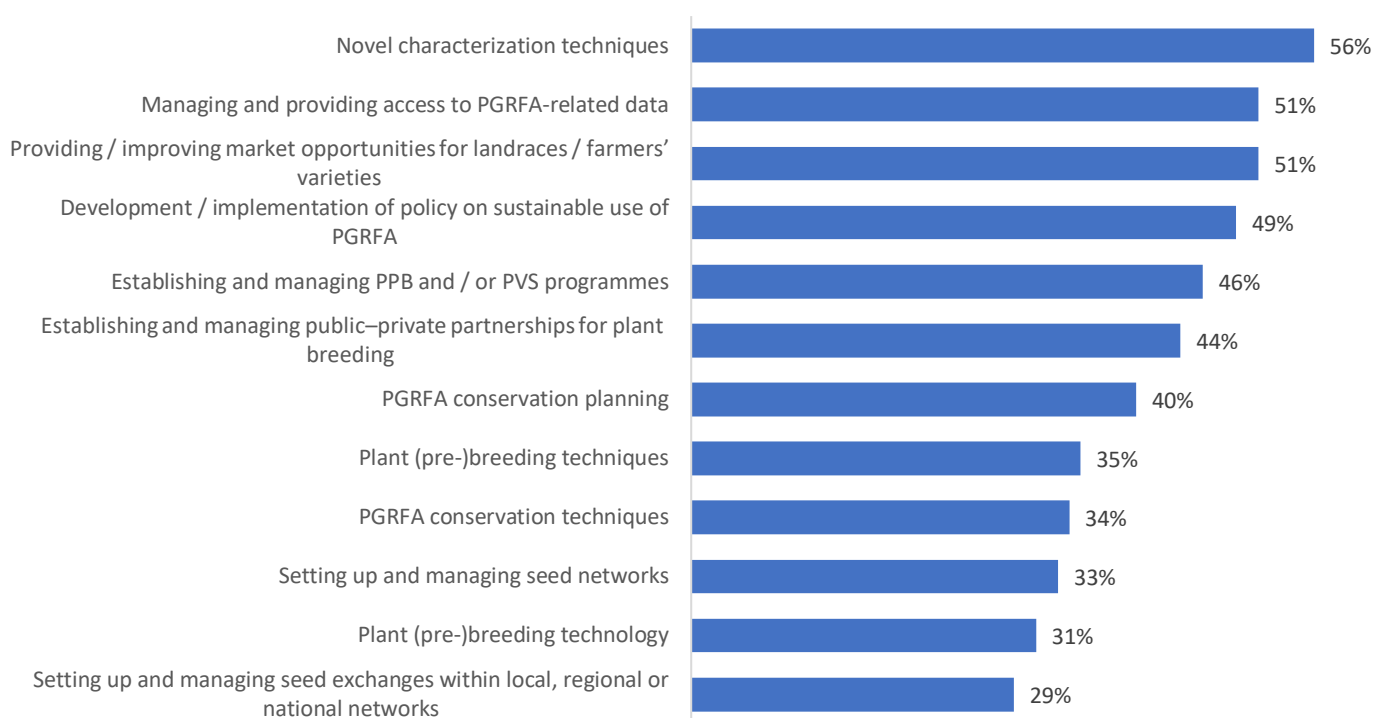
limited availability of seed for these species, especially perennial rye, both on local markets and in the gene banks. Gaining access to seeds for grapevine varieties is also highly problematic across the region.

Almost half of the survey respondents from Europe contend that there are no adequate marketing opportunities for landraces and farmers' crop varieties. Marketing opportunities may be limited primarily due to limited consumer interest in landraces, while farmers' varieties may be grown only very occasionally due to low yields, resulting in very niche markets. Moreover, prohibitive legislation regarding variety registration and seed certification may discourage such markets, and/or be complex and costly, and/or may not be well known or properly implemented.

#### 5.3.4 Resource constraints

In Europe, stakeholders emphasized the lack of skilled human resources, professional research staff and knowledge within many European gene banks. The most important areas in terms of capacity-building needs are novel characterization techniques, managing and providing access to PGRFA-related data, and providing/improving market opportunities for landraces/farmers' varieties. In addition, about half of survey respondents from this region believe that capacities in the development/implementation of policy on the sustainable use of PGRFA need to be strengthened, including through guidance for developing and implementing comprehensive strategies, policies and laws. The training of judges in plant breeders' rights (PBRs) to enforce the rights of entrepreneurs was explicitly mentioned as a way of promoting plant breeding activities by creating an enabling legal environment. There is also a need to facilitate access to legal information and increase understanding of the various legal steps involved in accessing germplasm, including with regard to ABS. Other areas for capacity building include the collection and preservation of PGRFA; awareness-raising among academia and research institutions; the creation of courses to explain the roles of both the formal and informal plant breeding and seed sectors in sustainable agriculture; and the development of characterization and documentation standards for all crops. Some countries also stressed the issue of loss of knowledge of cultivation practices due to the ageing of knowledgeable producers, hence the need to provide training to new generations of farmers.

**Figure 3.4**  
**Capacity-building needs reported by stakeholders in Europe (n = 91)**



In this region, the lack of financial resources in many gene banks hampers the maintenance of community seed banks and the characterization and evaluation of gene bank accessions, and hence the generation of valuable PGRFA-related data and information for plant breeding. Financial resources are particularly needed for: *in situ* conservation, including for conducting inventories, research and collection activities, with a special focus on underutilized species, landraces and CWR and the development of conservation strategies; the establishment of functioning community seed banks; long-term support for national gene banks and the strengthening of *ex situ* conservation activities, including the characterization, evaluation and documentation of gene bank material and the conservation of clonal material; the large-scale genotyping, phenotyping and adequate maintenance of cross-fertilizing species; the provision of technical support for PPB, research programmes on (pre-)breeding, and publicly funded plant breeding in marginal areas; the local production of traditional but forgotten/neglected crops, niche varieties and 'diversity seed' or heritage planting material; the supply of adequate equipment for drying, storing and packing seeds; strengthening local seed systems; developing markets for local diverse products; long-term support for coordination entities and networks; the funding of small projects; and training activities. It should be noted that, at the European level, the PGR Strategy recommends establishing a secure and sustained financial base backed by political will, to replace the scattered and insufficient funding support for PGR conservation and use, as part of an overarching investment plan.

## 5.4 Latin America and the Caribbean

### 5.4.1 Legal and policy issues

In Latin America and the Caribbean, a few countries do not have specific legislation and policy in place for the conservation and use of PGRFA, or the legislative framework and policies in place are not adequate or need updating, especially with regard to seed laws. The lack of an enabling and updated legislation for PGRFA in general, or the lack of specific policies for germplasm evaluation, in support of plant breeding activities, farmers' access to *ex situ* collections, PPB and/or PVS, were identified as examples of gaps in the national policy and legal frameworks that hinder the conservation and sustainable use of PGRFA. A large majority of reporting countries and stakeholders from this region report that the measures in place to promote the sustainable use of PGRFA do not cover all elements of sustainable use of PGRFA and/or there are problems with its implementation.

Lack of policies to promote farmer innovation in plant breeding is a cause of particular concern in the region, with more than 60 percent of survey respondents reporting that such policy is not in place, partly due to lack of awareness among policy-makers about the role of farmers in innovation and plant breeding. In addition, over 40 percent of survey respondents observed that existing standards and procedures for crop variety certification are not appropriate and can hinder the functioning of local seed systems. At a more operational level, some countries also mentioned the lack of an efficient national programme or strategy in all or some aspects of conservation and sustainable use. For instance, in one country, the national gene bank has not managed to implement a sustainable strategy focused on on-farm conservation and does not have a programme dedicated to plant breeding. As a result, no release of a new variety has been officially documented for more than two decades.

Enforcement issues were reported by a few countries from Latin America and the Caribbean. For instance, in one country, although the systematic registration of new varieties is provided for by the seed legislation, this has not yet been fully enforced. Some survey respondents commented on a lack of incentives (50 percent of respondents), financial resources (about 38 percent of respondents) and guidance (25 percent of respondents) to implement the national policy effectively. For instance, one respondent pointed out the lack of incentives for breeders and extension workers to adopt participatory practices. Additional issues highlighted by a notable number of reporting countries and survey respondents included lack of coordination mechanisms among the public administrations involved in PGRFA conservation and use activities, as well as a lack of awareness among policy-makers and the general population about the importance of the conservation and sustainable use of PGRFA, including the role of farmers in innovation and plant breeding.

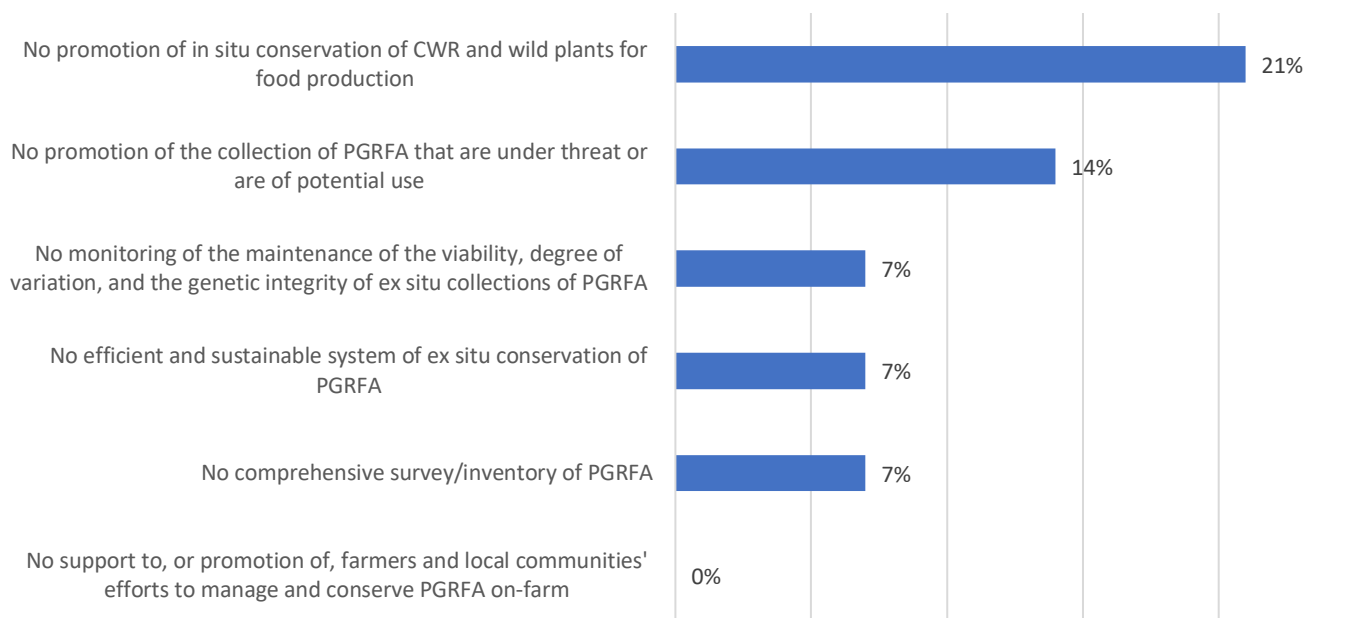
### 5.4.2 Technical and scientific issues

In Latin America and the Caribbean, some countries reported a lack of scientific interest and activities in specific types of crops, species and varieties, including with regard to lowland germplasm, CWR, wild plant species and underutilized species that have little commercial value. For instance, one country reported there being very few initiatives to research, inventory and identify PGRFA in *in situ* conditions to date, and observed that no research has been conducted on areas of high concentration of genetic diversity for these materials. Genetic erosion is also an issue. For instance, one country reported that no formal study on the state of genetic erosion of PGRFA has been carried out so far and that the level of erosion of *ex situ* collections exceeds 30 percent due to a lack of financial and human resources for regeneration activities. In some countries, advanced technologies such as molecular tools and DNA markers are not available, and monitoring of the maintenance of genetic integrity, limited to food security crops such as maize and beans, is done by using agro-morphological markers only.



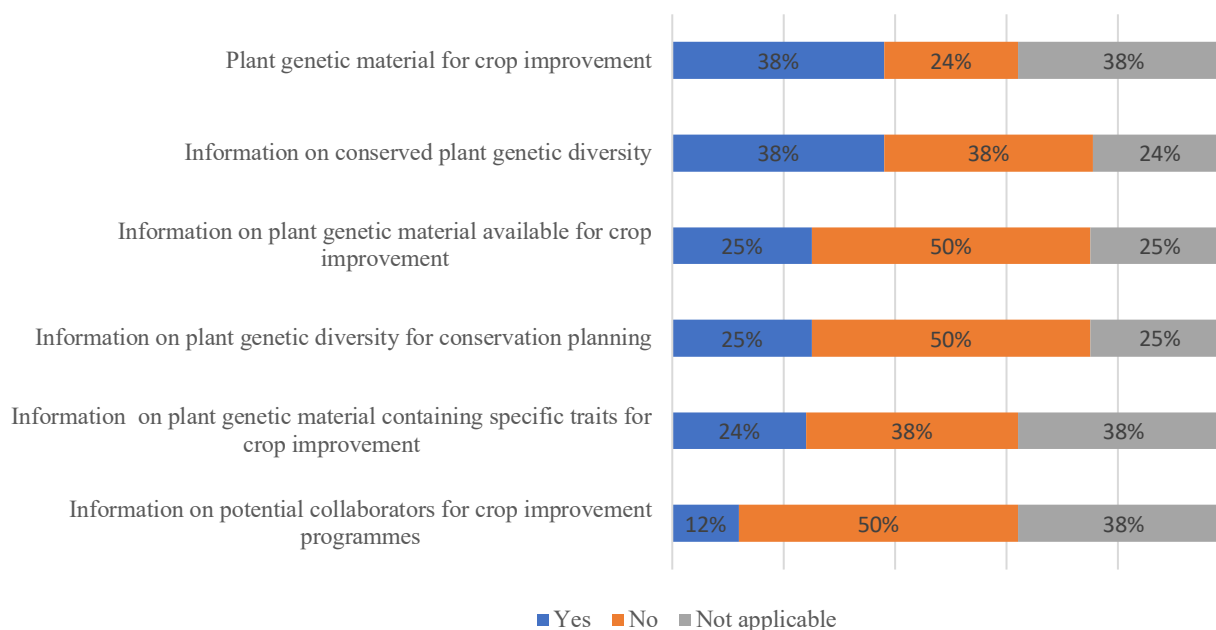
Figure 4.1 provides information on the type of activities lacking for the conservation of PGRFA in Latin America and the Caribbean.

**Figure 4.1**  
**Gaps in the conservation of PGRFA in Latin America and the Caribbean**  
 (% of reporting countries - n = 14)



Almost 40 percent of survey respondents from Latin America and the Caribbean stressed difficulties in obtaining plant genetic material for crop improvement. Among the challenges cited by stakeholders from this region are the poor functioning of national gene banks, which are unable to provide an adequate range of materials for public research, breeding or conservation programmes; complicated, time-consuming and costly procedures for accessing material; lack of direct linkages between *ex situ* conservation and *in situ* conservation programmes such as national parks, and between the private and the public sectors; lack of comprehensive collections for neglected and underutilized crops; lack of information on the availability of pre-bred lines; concerns that the use of 'wild' material would extend the duration of the breeding process; and confusion and uncertainty over issues of ownership, IPR and ABS, which often explains why public research and breeding programmes may rely more on self-collected materials or those obtained from international or commercial sources. In addition, for a notable proportion of survey respondents from Latin America and the Caribbean, obtaining information associated with PGR is challenging, especially with regard to information on conserved plant genetic diversity.

**Figure 4.2**  
**Constraints regarding access to PGRFA material (germplasm) or related information required for sustainable use in Latin America and the Caribbean (n = 8)**

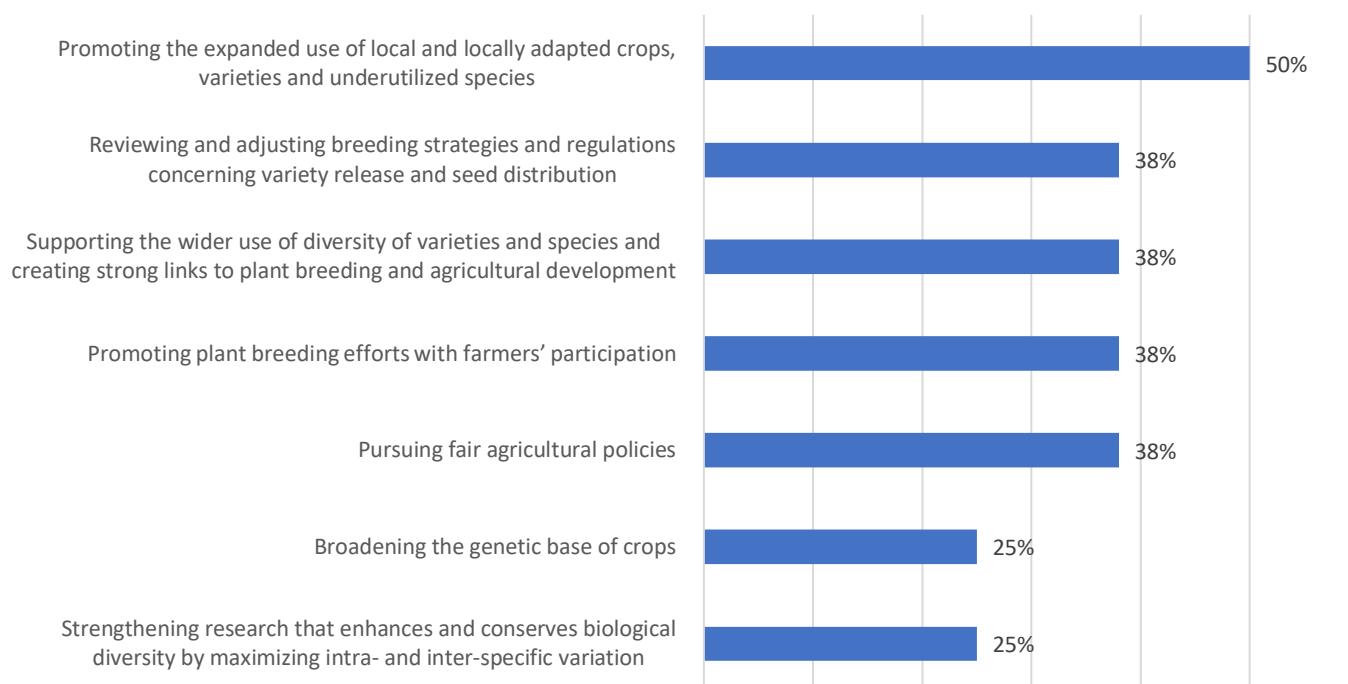


#### Difficulties in obtaining:

In this region, a lack of integration or compatibility among the different information systems, or a lack of centralized and integrated information and documentation systems in some other countries, coupled with weaknesses in the form and frequency of records, are significant bottlenecks to the use of PGRFA. For example, one national report mentions that, while many research studies have provided valuable data, this information has not been centralized in a common database and has not been classified by crop, native variety and their distribution by zones. In other countries, the data and information on CWR and edible wild plants, farmers' varieties or native varieties are very limited and scattered because they have not been documented in a systematic way; or there is a lack of data and information about losses of materials and about the state of the materials conserved *ex situ*, despite the collaboration of university research centres, agricultural companies and public entities. As a consequence, the needs in terms of duplication, regeneration and harvest have not been fully identified.

Generally speaking, stakeholders from Latin America and the Caribbean highlighted the need to pay greater attention to sustainable use and the implementation of Article 6 of the International Treaty. In this region, gaps are particularly high in policies for promoting the expanded use of local and locally adapted crops, varieties and underutilized species; reviewing and adjusting breeding strategies; supporting the wider use of diversity of varieties and species; and promoting plant breeding efforts with farmers' participation.

**Figure 4.3**  
**Gaps in the sustainable use of PGRFA in Latin America and the Caribbean with regard to policy/legal measures for (% of reporting countries - n = 14)**



Some countries specifically reported that pre-breeding programmes are very limited and that PPB and/or PVS are very rare because they are not included in public policies, and/or the internal procedures of national institutions restrict access by farmers to *ex situ* collections, and/or there is no incentive and training available for breeders, curators and extensionists to adopt such participatory practices.

#### 5.4.3 Seed distribution and marketing of landraces and farmers' crop varieties

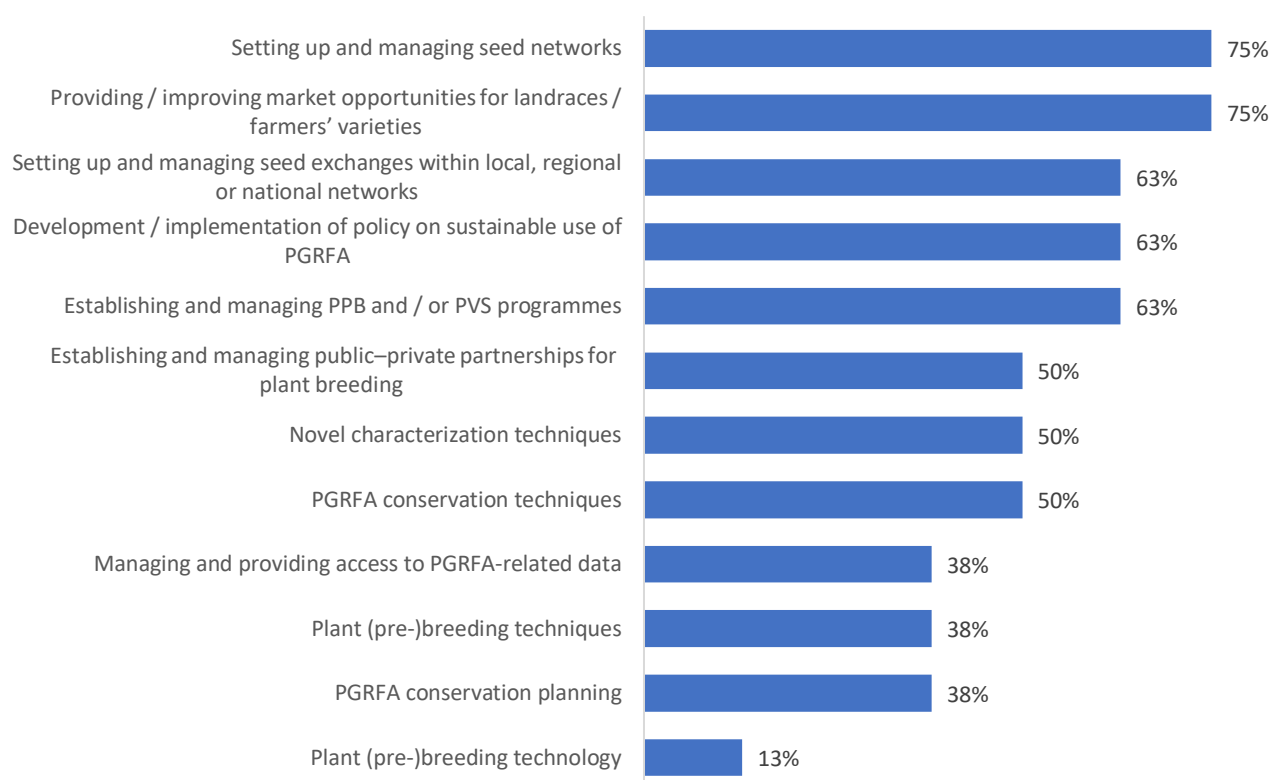
In Latin America and the Caribbean, a large majority of stakeholders (75 percent) consider that access to sufficient quantities of seed of an adequate range of crop varieties is difficult, primarily because quantities of seed available for distribution are limited due to the cost of reproduction; quantities of seed for vegetatively propagated crops such as cassava and sweet potato are particularly small; and dependence on commercial seed and promotion of crops and varieties with commercial value tend to restrict the amount of PGRFA readily available to farmers. In addition, for more than 60 percent of survey respondents from this region, there are no adequate marketing opportunities for landraces and farmers' crop varieties. Two main issues were highlighted by stakeholders. First, commercial markets tend to favour uniformity over diversity by promoting crops and varieties with commercial value, thereby discouraging rather than adding value to local crop diversity. Second, although policies to support the marketing of landraces and farmers' varieties have been adopted, for instance by allowing individual or groups of farmers to produce seeds of landraces and sell them at a premium price to the agricultural supply agency, they are neither well known nor properly implemented.

#### 5.4.4 Resource constraints

In this region, the highest priorities for capacity building are setting up and managing seed networks and providing/improving market opportunities for landraces/farmers' varieties. A large majority of stakeholders also consider that capacity-building needs in setting up and managing seed exchanges, establishing and managing PPB and/or PVS programmes, and

developing/implementing policy on sustainable use of PGRFA, are important. Lack of legal expertise was also highlighted by some reporting countries, especially given that the focal points for the International Treaty are usually technicians involved in the bioprospecting, collection, conservation and characterization of PGRFA who have no legal knowledge, hence the need to provide them with adequate legal training. Another legal and policy challenge raised in the national reports is the difficulty of ensuring synergy and coherence among the International Treaty, the CBD and UPOV when developing relevant national legislation.

**Figure 4.4**  
**Capacity-building needs reported by stakeholders in Latin America and the Caribbean (n = 8)**



A few countries from this region also mentioned a decline in the number of producers, the ageing of human resources, and the lack of a skilled workforce. The lack of adequate human resources can also relate to management and leadership skills in gene banks and other institutions involved in the conservation and use of PGRFA. In addition, a number of countries and stakeholders flagged infrastructure deficiencies, including a lack of functional seed storage facilities and other operational issues such as lack of access to irrigation and lack of cold rooms to enable long-term conservation. In this region, lack of financial resources was identified as a major constraint by many countries for conducting surveys, inventories and comprehensive and systematic studies of PGRFA *in situ*; for adequate conservation and monitoring of PGRFA *ex situ*; for conducting R&D activities; for phenotypic evaluation and agronomic characterization of specific crops; for multiplication and distribution of seeds; and for training and extension services.

## 5.5 Near East

### 5.5.1 Legal and policy issues

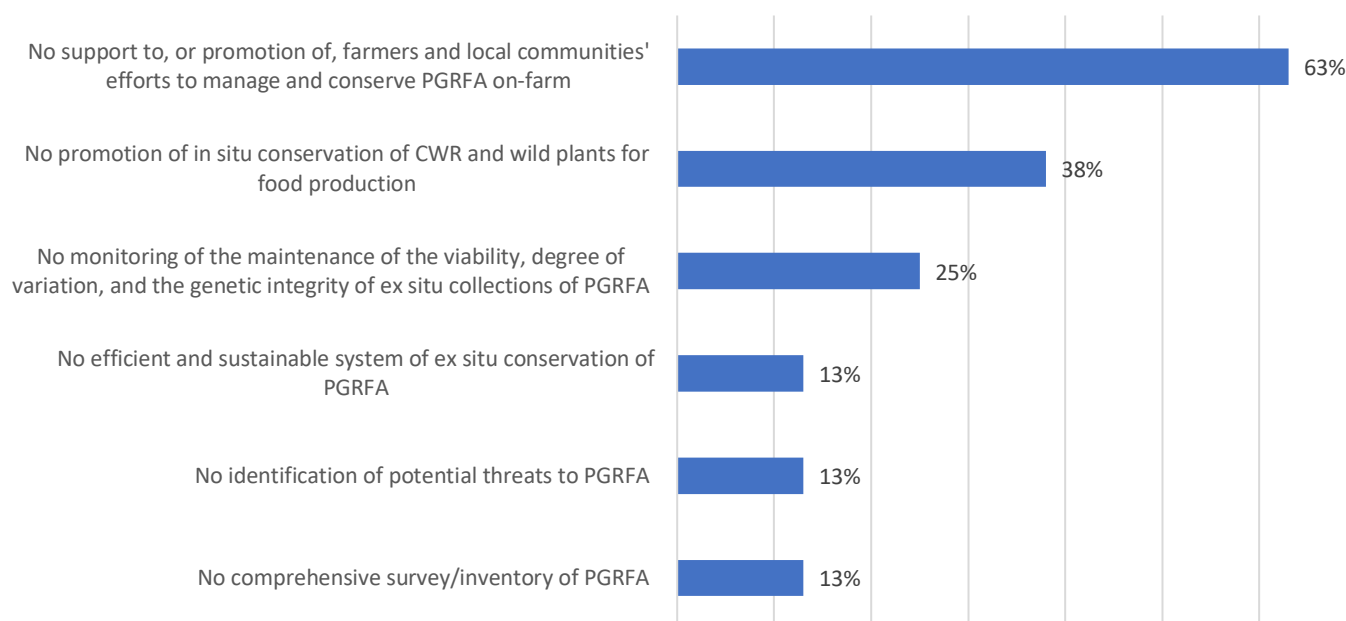
In the Near East, some countries reported that the current legislation and policies for PGRFA are not adequate or need updating to ensure compliance with the International Treaty, for instance in relation to PBR. In other countries, laws and policies are missing in specific areas. For instance, in one country, one of the factors explaining the complete absence of *in situ* conservation activity is the lack of a clear policy at national level for the conservation of PGRFA. Although almost all reporting countries declare having some policy and legal measures in place that promote the sustainable use of PGRFA for all or some of the areas listed under Article 6.2 of the International Treaty, only a small minority of survey respondents from that region (about 17 percent) believe that a national policy in support of sustainable use is both comprehensive and effective. The lack of policies to support farmer innovation in plant breeding is particularly alarming, considering that nearly 60 percent of survey respondents declare that such policy has not been adopted. In addition, more than 40 percent of stakeholders observed that standards and procedures for crop variety certification are inadequate and/or are not properly implemented.

Countries and stakeholders from the Near East reported that implementation of the relevant legislation and policies pertaining to PGRFA conservation and use is low and that there is a lack of guidance (38 percent of survey respondents), financial resources (38 percent of respondents), and incentives (25 percent of respondents) to implement the relevant national policy efficiently. The need to facilitate the enforcement of existing legislation through the adoption of implementing regulations was strongly emphasized. Lack of public awareness about the importance of the conservation and use of PGRFA is a serious concern for some stakeholders from the Near East, who called for support to develop and use a methodology to address this issue. Stakeholders from the Near East also highlighted limited intersectoral coordination in some countries: 50 percent and 33 percent of survey respondents believe that there is a lack of coordination mechanisms among the public administrations involved, and/or between the public and industry sectors, respectively.

### 5.5.2 Technical and scientific issues

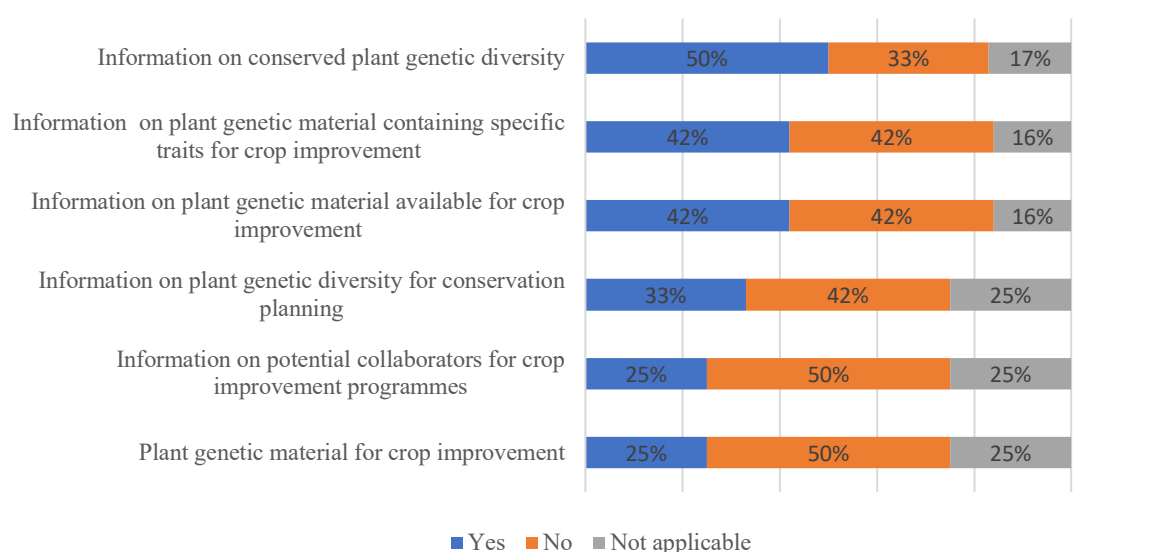
Among the technical issues for conservation of PGRFA cited by some countries in the Near East are the lack of a mechanism to assess and monitor crop-targeted threats and genetic erosion on a regular basis, and the lack of comprehensive survey or inventory work, especially on-farm and in botanical gardens. Furthermore, although all reporting countries have established *ex situ* collections of PGRFA and almost all reporting countries monitor the maintenance of the viability, degree of variation, and the genetic integrity of *ex situ* collections of PGRFA, difficulties remain and some countries need technical assistance for the long-term conservation of PGRFA, including through the use of new technologies. For instance, one national report notes that there has been almost no regeneration of *ex situ* accessions and that only two limited activities have been carried out for multiplication and germination tests in the past few years. In another country, monitoring is done on an irregular basis within intervals that exceed ten years. Figure 5.1 provides information on the type of activities lacking for the conservation of PGRFA in the Near East.

**Figure 5.1**  
**Gaps in the conservation of PGRFA in Near East (% of reporting countries - n = 8)**



Obtaining plant genetic material for crop improvement was found to be challenging for one-quarter of survey respondents from this region. The main constraints limiting access to PGR include lack of communication and coordination between different research entities; conflicts between national and international policies (such as MTAs, IPRs and Farmers' Rights); lack of cooperation among agencies to provide material for education programmes on genetic resources; lack of pre-breeding activities; lack of botanical surveys; and the lack of a publicly available online database. In effect, half of the survey respondents from the Near East consider that access to information on conserved plant genetic diversity is problematic.

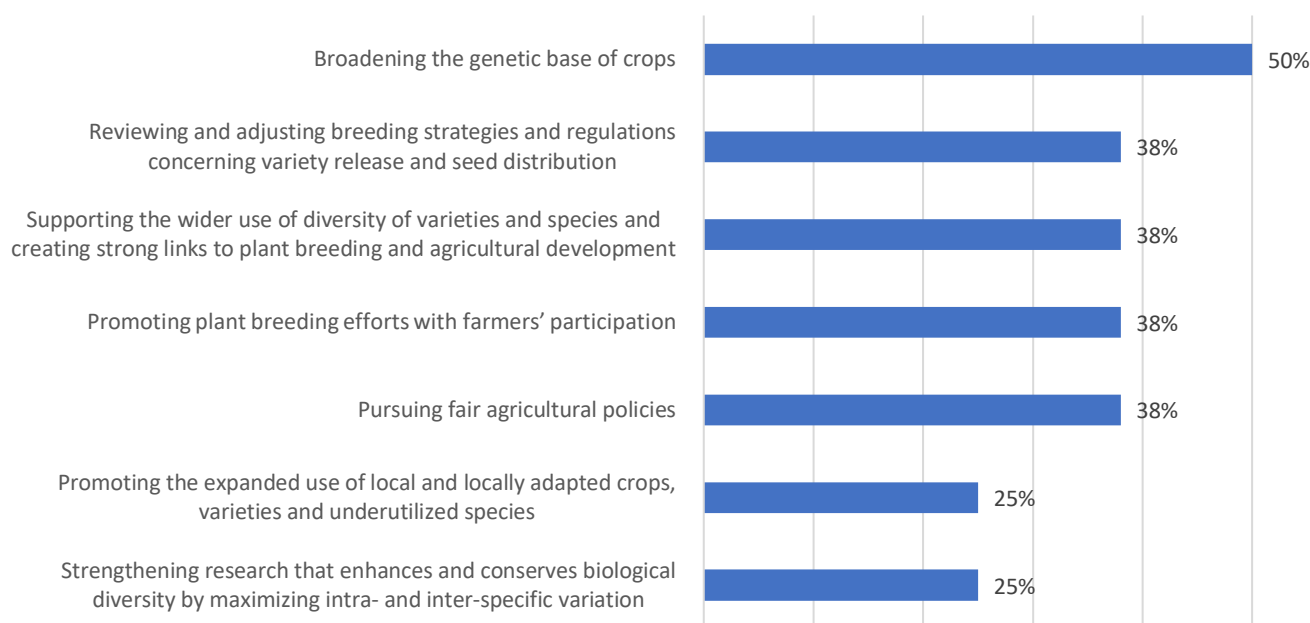
**Figure 5.2**  
**Constraints regarding access to PGRFA material (germplasm) or related information required for sustainable use in the Near East (n = 12)**



**Difficulties in obtaining:**

In this region, the greatest gaps in policies relate to broadening the genetic base of crops; reviewing and adjusting breeding strategies; supporting the wider use of diversity of varieties and species; promoting PPB; and pursuing fair agricultural policies.

**Figure 5.3**  
Gaps in the sustainable use of PGRFA in the Near East with regard to policy/legal measures for  
(% of reporting countries - n = 8)



Some stakeholders reported that there are no or very limited pre-breeding activities in the country(ies) where they work, while others pointed to the lack of plant breeding and genetics departments due to the shortage of trained human resources. Generally speaking, poor communication technology and lack of access to molecular tools and advanced technologies are significant challenges for this region.

### 5.5.3 Seed distribution and marketing of landraces and farmers' crop varieties

In the Near East, half of the survey respondents consider that gaining access to sufficient quantities of seed of an adequate range of crop varieties is problematic. According to stakeholders from this region, there is no farmers' seed production and no established seed sector involving seed companies; quantities of seed in gene banks are limited, and/or the range of seed available is restricted to a few crops selected by the Ministry of Agriculture; the prevalence of commercial varieties has resulted in the disappearance of traditional varieties, vegetable landraces and fruit landraces; prices of crops are too high; and there is no adequate seed distribution infrastructure.

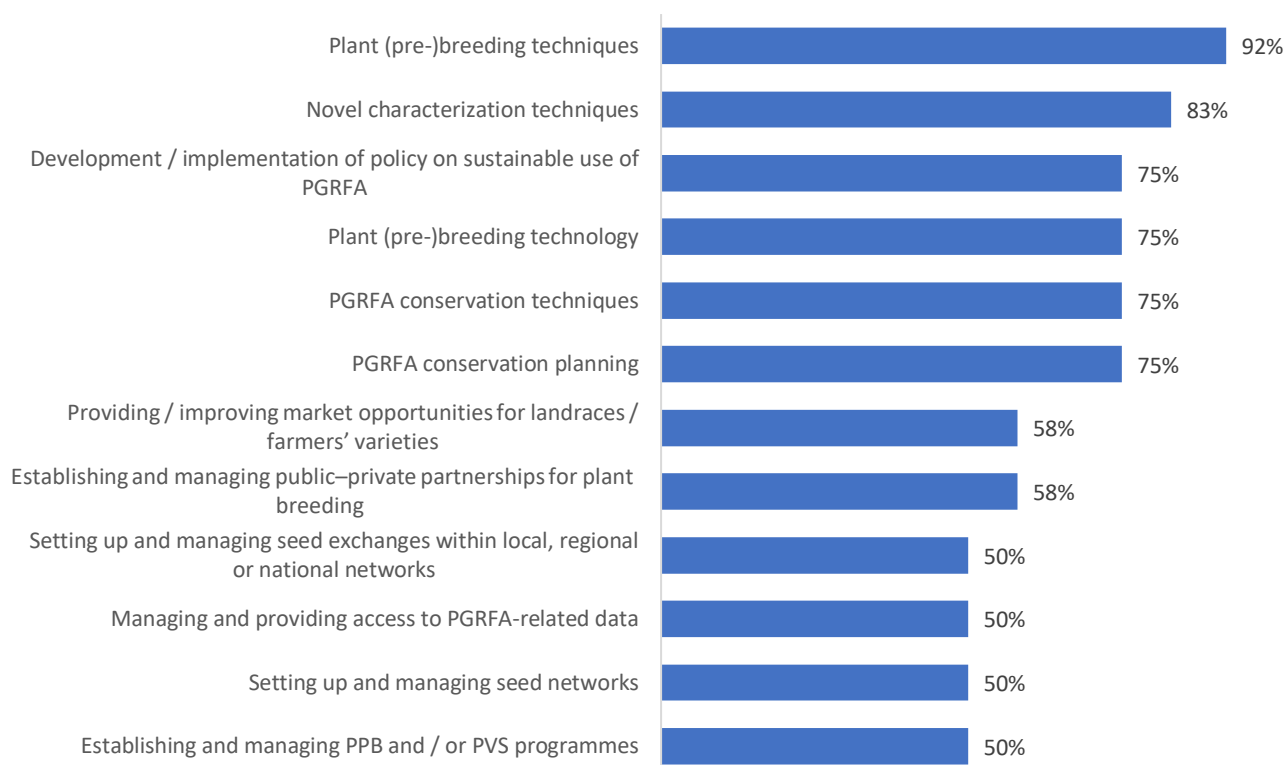
In addition, no fewer than half of survey respondents from the Near East believe that marketing opportunities for landraces and farmers' crop varieties are inadequate. As in many other regions, the marketing of landraces and, to a lesser extent, farmers' varieties, is very limited and done on a very small scale, mostly at farmer level, due to the prevalence of commercial varieties. For stakeholders from this region, there is a potential market opportunity, but efforts require further additional financial support and plant breeding.

### 5.5.4 Resource constraints

In the Near East, the two most important areas for capacity-building requirements are plant (pre-)breeding techniques and novel characterization techniques. Some stakeholders reported

a lack of plant breeding and genetics department in the country where they work due to the lack of a skilled workforce. For a large majority of stakeholders, there is also a need to increase capacities in developing/implementing policy on the sustainable use of PGRFA, as well as in conservation techniques and conservation planning. For instance, in one country, the complete absence of *in situ* conservation activity is due to several factors, including the lack of technical skills to carry out effective and comprehensive germplasm collection missions. Guidance is also needed on drafting legislation and conducting an analysis of the gaps and needs in PGRFA conservation and use.

**Figure 5.4**  
**Capacity-building needs reported by stakeholders in the Near East (n = 12)**



In this region, some countries reported a lack of adequate equipment and secure facilities, including cold rooms for seed storage, and limited material available for public research. In addition, financial resources are needed for on-farm and *in situ* conservation, including for improving the infrastructure; conducting pilot projects on conservation and use of PGRFA; strengthening markets for local diverse products; training activities; and for public awareness campaigns.



## 5.6 North America

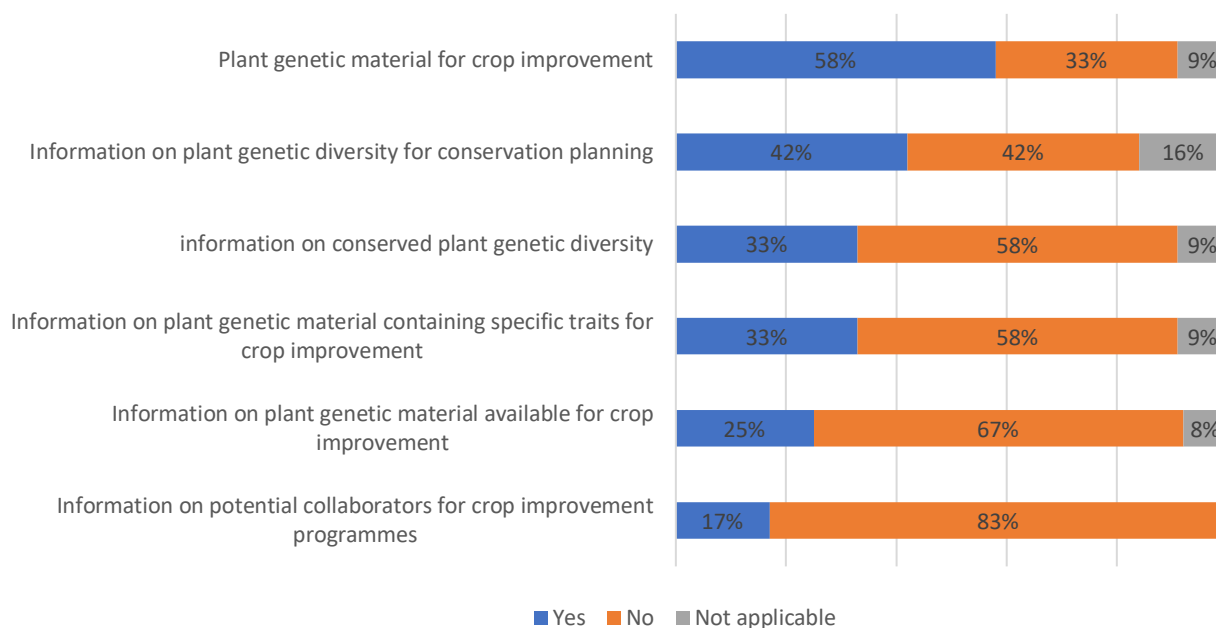
### 5.6.1 Legal and policy issues

In North America, no specific legal and policy issue was raised by the countries or survey respondents. However, it is noteworthy that only 25 percent of survey respondents believe that a national policy in support of sustainable use exists and is both comprehensive and effective, whereas 50 percent of respondents disagree. For instance, fewer than 20 percent of survey respondents from this region consider that policies are in place to promote farmer innovation in plant breeding. Furthermore, 25 percent of respondents to the survey from that region reported a lack of coordination mechanisms among the public administrations involved.

### 5.6.2 Technical and scientific issues

Unlike for the other regions, no graphic on the gaps in conservation and use of PGRFA in North America is provided because no challenge was reported under the standard questions of the national reports. However, the survey respondents from this region expressed difficulties in identifying the gaps and challenges in conservation of PGRFA. Another important challenge relates to the need to continuously regenerate PGRFA material to keep pace with the demand for seed samples in a context where one country in this region distributes an average of 200 000 to 250 000 samples a year, about one-quarter of the international total. Importantly, the proportion of survey respondents who generally consider that obtaining plant genetic material for crop improvement is difficult is the highest of all regions (about 60 percent of stakeholders). Among the issues raised by stakeholders are a lack of coordination among countries; compliance with national ABS regulations; conflicts between national and international policies (such as MTAs, IPRs and Farmers' Rights); and complications with accessing private materials before commercialization. Access to information associated with PGR is also seen as a challenge for a notable number of survey respondents due to gaps in databases, especially when it is for conservation planning. Furthermore, some stakeholders commented that PPB tends to rely on public research and large companies and that plant breeding needs to be strengthened in the context of climate change.

**Figure 6.1**  
**Constraints regarding access to PGRFA material (germplasm) or related information required for sustainable use in North America (n = 12)**



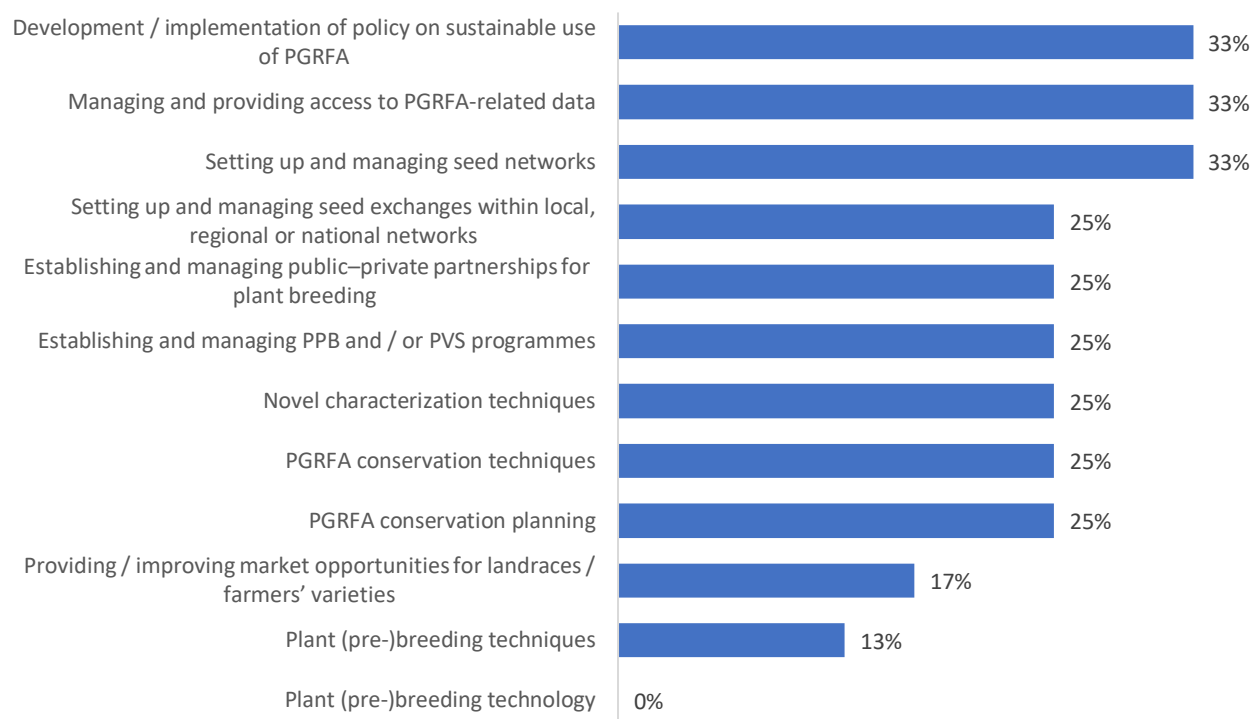
### 5.6.3 Seed distribution and marketing of landraces and farmers' crop varieties

In North America, no issue with regard to gaining access to sufficient quantities of seed of an adequate range of crop varieties was reported. Although the problem is not as critical as in other regions, marketing opportunities for landraces and farmers' crop varieties are considered inadequate by one-quarter of survey respondents from this region, especially due to prohibitive regulations regarding variety registration and seed certification.

### 5.6.4 Resource constraints

Although the capacity-building needs are lower in North America than in other regions, about one-third of survey respondents highlighted the need to increase capacities in the development/implementation of policy on the sustainable use of PGRFA, on managing and providing access to PGRFA-related data, and on setting up and managing seed networks. In addition to the predefined categories of capacity-building needs of the questionnaire, stakeholders also highlighted the need to increase capacities in plant taxonomy and in performing some basic PGRFA management and operations activities; for instance, there is a lack of knowledge about how to properly germinate CWR.

**Figure 6.2**  
**Capacity-building needs reported by stakeholders in North America (n = 12)**



In this region, stakeholders expressed concern about resource constraints to meet the demand for seed samples and ensure the continuous regeneration of PGRFA material, as well as a lack of sufficient resources allocated to identify gaps and challenges in the conservation and use of PGRFA. According to the survey respondents from North America, greater financial resources should be provided for on-farm, *in situ* and *ex situ* conservation, including for the collection and characterization of PGRFA, especially minor crops, and for the public sector to build capacities to better promote the sustainable use of PGRFA.

## 5.7 Southwest Pacific

### 5.7.1 Legal and policy issues

Two out of four reporting countries from Southwest Pacific have not integrated PGRFA-related activity into any broader programme or policy. In this region, there are significant gaps with regard to policies in support of sustainable use of PGRFA. More than 70 percent of survey respondents indicate that such policy does not exist, or that it does not cover all elements of the sustainable use of PGRFA, and/or that there are problems with its implementation. For instance, according to more than 60 percent of respondents from the region, policies to promote farmer innovation in plant breeding are not in place, and some stakeholders observed that no, or only very limited standards and procedures for crop variety certification have been adopted.

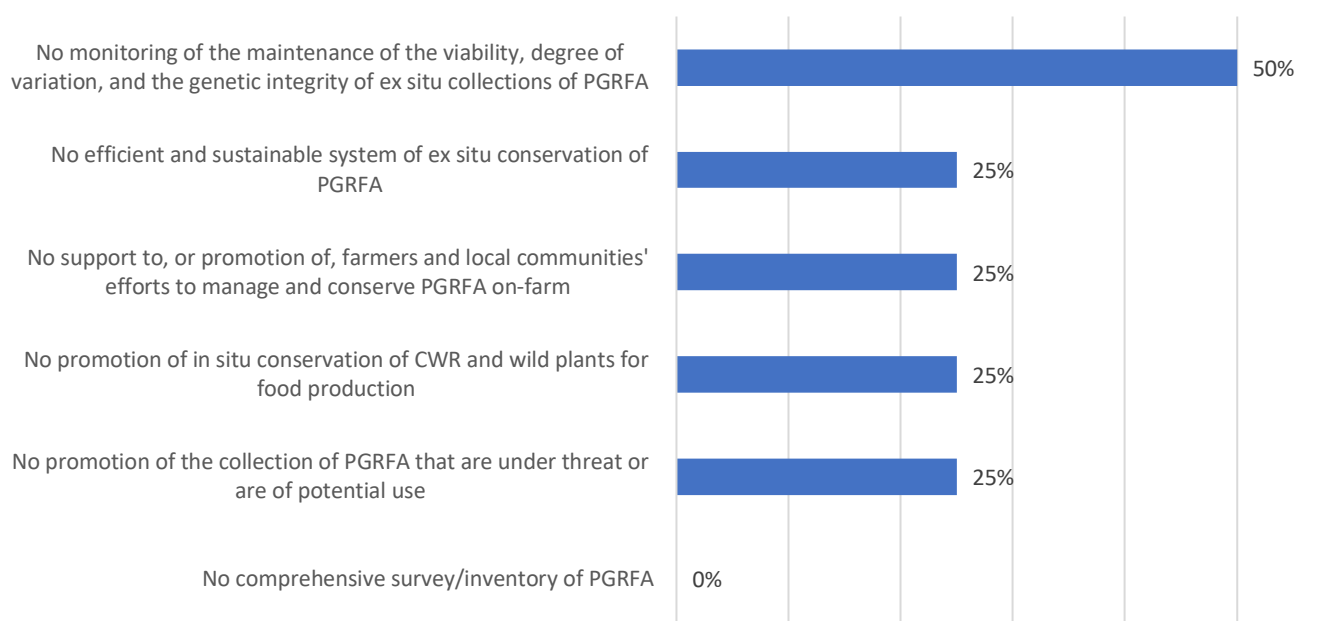
According to some stakeholders from Southwest Pacific, there are insufficient financial resources (35 percent of survey respondents), guidance (about 30 percent of respondents) and incentives (18 percent of respondents) to implement the relevant national policy efficiently, as well as a general lack of awareness of the importance of PGRFA and the International Treaty among policy-makers, the rural population and the public. In addition, about 29 percent of respondents to the survey from that region noted a lack of coordination mechanisms among the public administrations involved.

### 5.7.2 Technical and scientific issues

In some countries from Southwest Pacific, the conservation of PGRFA, especially annual crops that require yearly maintenance and duplication efforts, is undermined by a lack of financial, human and technical skills. Additional challenges include the fact that, in some countries, very few studies have sought to promote the concept of *in situ* conservation of PGRFA, that the main objective of conservation programmes has been to adapt crops to environmental and climatic conditions rather than supporting on-farm genetic diversity, and that conservation efforts have been very scarce and localized, for instance focusing on wild banana species. While surveys have been conducted for the major staple crops, transport difficulties in remote areas prevent the organization of collecting missions in difficult-to-access regions. Furthermore, some stakeholders from this region observed that core collections address general, rather than specific, genetic variation because research into methodologies to identify targeted genetic variation has traditionally been neglected. Added to this, the poor characterization, evaluation and documentation of PGRFA makes it difficult to track genetic erosion.

Figure 7.1 provides information on the type of activities lacking for the conservation of PGRFA in Southwest Pacific.

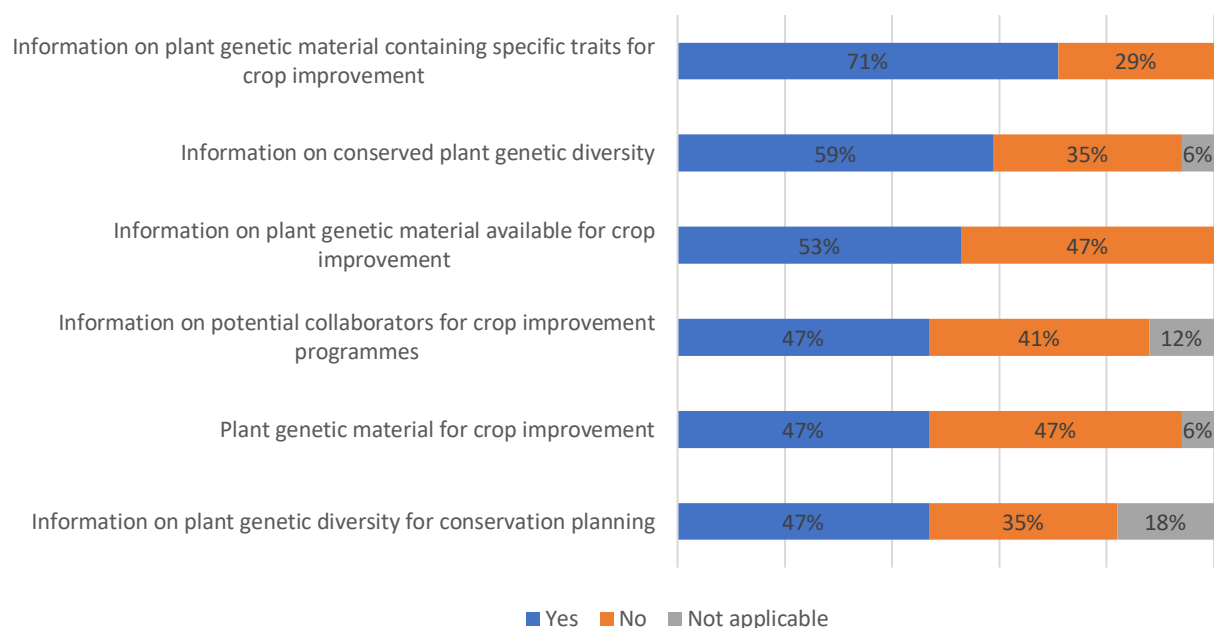
**Figure 7.1**  
**Gaps in the conservation of PGRFA in Southwest Pacific**  
 (% of reporting countries - n = 4)



Southwest Pacific is the region where the highest percentage of stakeholders believe that there is not an adequate range of plant genetic material available for utilization in public research programmes or in commercial crop variety improvement programmes (about 35 percent and 40 percent of survey respondents, respectively). Public research and breeding programmes generally rely on the regional Centre for Pacific Crops and Trees (CePACT) and other organizations to import plant genetic material. In this context, access to wild relatives is usually restricted. Nearly half of the survey respondents from Southwest Pacific report difficulties in obtaining plant genetic material for crop improvement. A range of constraints were identified by stakeholders from this region, including poor logistics for islands that are geographically remote; inadequate access to passport, characterization and evaluation data on the plant material available; lack of tissue culture laboratories, particularly for clonal crops and for crops that are not included in the list of crops covered under the Multilateral System; low consideration of the private sector by the regional gene banks, on which public research and breeding programmes rely to obtain plant genetic material; insufficient policies and guidelines to promote participation in commercial crop improvement programmes; and restrictive import policies, especially for CWR, as well as the costs associated with the import of germplasm. As shown in the following graphic, access to information associated with PGR is a particularly serious concern in this region. A very large majority of survey respondents highlighted difficulties in accessing information on plant genetic material containing specific traits for crop improvement, as well as on conserved plant genetic diversity.

**Figure 7.2**  
**Constraints regarding access to PGRFA material (germplasm) or related information required for sustainable use in Southwest Pacific (n = 17)**

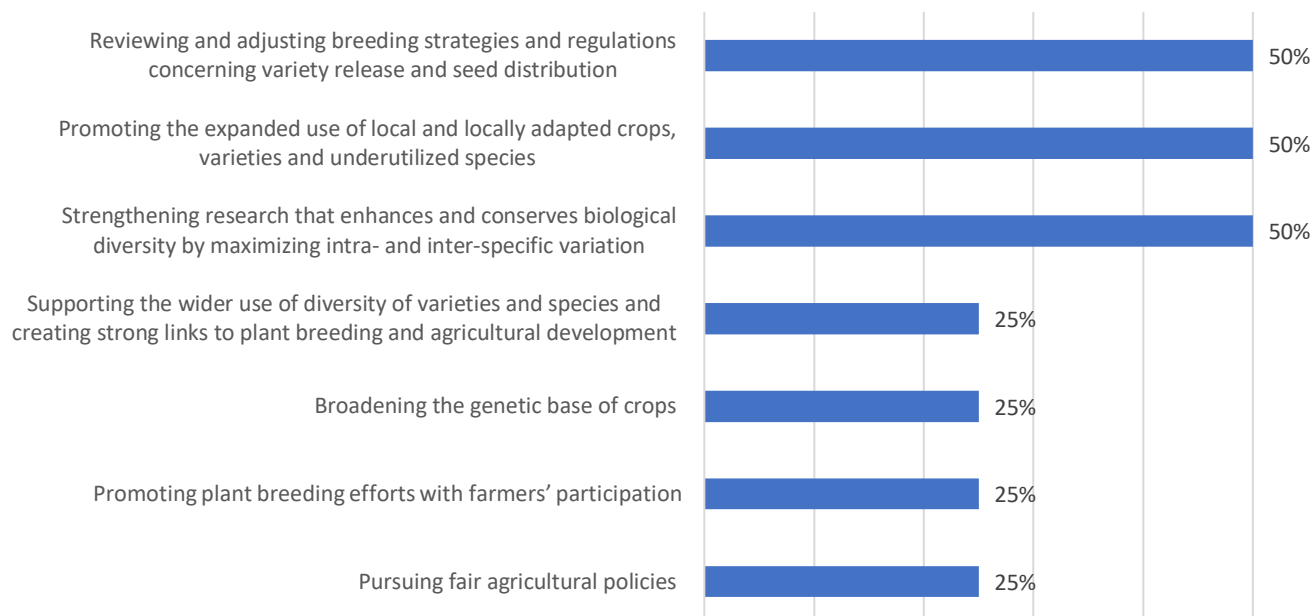
**Difficulties in obtaining:**



A lack of characterization and evaluation data and of information on the agronomic and specific traits needed by breeders, including for orphan crops and crops of lower commercial value, are critical challenges. The situation is further complicated by the lack of a methodology to identify targeted genetic variation and that of sound record-keeping systems at farm level to help plant breeders in making educated decisions. Added to this, access to information is hampered by: inadequate data management in national gene banks, including a lack of integrated, efficient and comprehensive information systems or databases on PGRFA available for crop improvement; a low level of understanding and practice of conservation planning; and fragmented information on potential collaborators for crop improvement programmes.

In this region, some countries mentioned the lack of any commercial crop variety improvement programme, and of PPB. Important challenges include the lack of an enabling policy framework, especially with regard to: breeding strategies and regulations concerning variety release and seed distribution; promotion of the expanded use of local and locally adapted crops, varieties and underutilized species; and the strengthening of research to enhance and conserve biological diversity by maximizing intra- and inter-specific variation.

**Figure 7.3**  
**Gaps in the sustainable use of PGRFA in Southwest Pacific with regard to policy/legal measures for (% of reporting countries - n = 4)**



### 5.7.3 Seed distribution and marketing of landraces and farmers' crop varieties

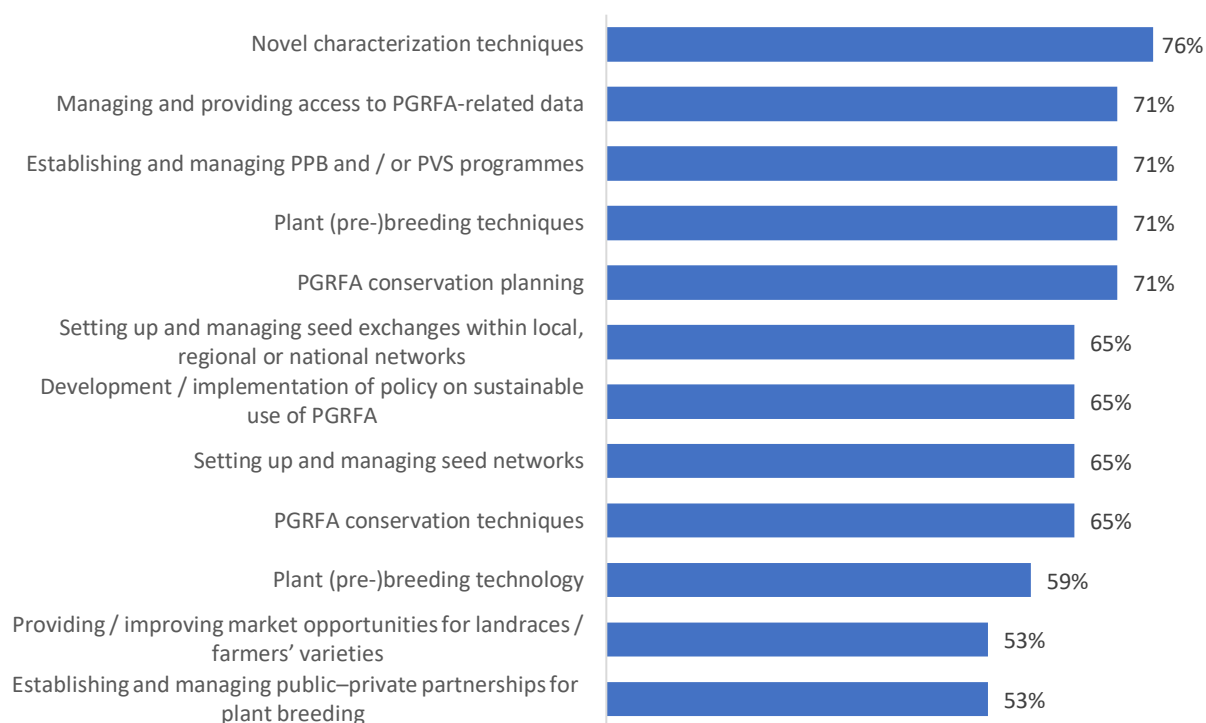
According to more than 40 percent of the survey respondents from Southwest Pacific, gaining access to sufficient quantities of seed of an adequate range of crop varieties is not straightforward. In this region, lack of resources and skills hampers seed production; for instance, there is a lack of certified and reliable seed cleaners and growers. In addition, as in other regions, minor crops and traditional varieties with less commercial potential have been heavily neglected in breeding and the varieties available do not therefore meet the needs of farmers, while the genetic diversity of the varieties available is limited. Furthermore, there are limitations on the quantities available for plant material acquisition due to the reproduction capacity of institutions; the limited quantities of seed available means that the bulking process is very time-consuming; and there is too little information available on seed collection. While there is no integrated effective seed system that facilitates access to quality seeds and planting materials for farmers and rural households, smallholder farmers are restricted by the cost of seed, including imported, open pollinated and hybrid seeds and varieties from countries of origin. Logistical issues also limit access to seed in remote and difficult-to-access areas.

In this region, changes in food habits, coupled with the promotion of varieties with commercial value, are challenges to the promotion and marketing of landraces and indigenous and farmers' crops. About the same percentage of survey respondents believe that marketing opportunities for landraces and farmers' crop varieties in Southwest Pacific are adequate or inadequate (around 20–25 percent of respondents), reflecting contrasting situations across the countries. A few stakeholders highlighted the lack of consumer demand for landraces and farmers' crop varieties, as well as a lack of enabling legislation, marketing strategies and marketing facilities. Other stakeholders reported that, when market opportunities exist, they are not fully exploited, and no price premium can be observed for unique landraces or farmers' crop varieties, which may call for the expansion of new markets towards processed or secondary products. Finally, while adequate market opportunities can be found in the main centres of some countries, the poor road infrastructure is a significant limiting factor for farmers in most rural areas.

### 5.7.4 Resource constraints

Capacity-building needs are substantial in Southwest Pacific, especially in conservation planning, novel characterization techniques, managing and providing access to PGRFA-related data, establishing and managing PPB and/or PVS programmes, and plant (pre-)breeding techniques. In particular, stakeholders from this region highlighted the need to increase capacities for evaluating and analysing materials received from CePACT. Stakeholders also emphasized that the technical assistance available to support the national breeding programme is very limited. In addition, about 65 percent of survey respondents from this region reported a need to increase capacities in the development and/or implementation of a policy on sustainable use of PGRFA. According to stakeholders, legal support and expertise are needed to develop national legislation, policies and strategies pertaining to the conservation and sustainable use of PGRFA to fully implement the International Treaty. The elaboration of standards and operating practices for *ex situ* conservation and the development of market information tools and systems are other areas in which training and ongoing support are considered important.

**Figure 7.4**  
**Capacity-building needs reported by stakeholders in Southwest Pacific (n = 17)**



Furthermore, in this region, a lack of financial resources and adequate equipment undermines the conservation of PGRFA, especially annual crops that require yearly maintenance and duplication efforts. In addition, high transport costs prevent organizations involved in the conservation of PGRFA from conducting follow-up missions and monitoring trends in the conservation of PGRFA in remote areas. According to stakeholders, there is a need for funding for: the testing and distribution of seeds; the identification and collection of PGRFA-related data and their facilitated access by pre-breeders/breeders; *in situ* conservation, particularly for CWR; the strengthening of *ex situ* conservation efforts, including the maintenance of germplasm collections and tissue culture facilities; the development of national action plans for conservation and use of PGRFA; and, generally speaking, for all facets of the PGRFA conservation and use system.



## 6. CONCLUSION AND RECOMMENDATIONS

This study has sought to examine bottlenecks and challenges to the conservation and sustainable use of PGRFA in Africa, Asia, Europe, Latin America and the Caribbean, the Near East, North Africa and Southwest Pacific, with a view to furthering implementation of Articles 5 and 6 of the International Treaty at the regional level.

The study demonstrates the critical need to:

- address the limitations of the policy and legal framework by adopting and implementing policies and legislation that are supportive of informal seed systems, certification and marketing of landraces/farmers' varieties and varieties derived from PPB, and the realization of Farmers' Rights, among others;
- improve intersectoral coordination through the establishment of national coordination committees involving all relevant stakeholders from the public and industry sectors;
- raise awareness of the importance of the International Treaty and the value and use of PGRFA, including on-farm varieties and neglected and underutilized species, among all stakeholders located at different levels;
- pay more attention to *in situ* and on-farm conservation of CWR, WFP, landraces, underutilized species, and non-economic and minor crops;
- enhance the quality, efficiency, coverage and sustainability of *ex situ* conservation systems, including by strengthening the operation of, and coordination among, gene banks, while simplifying procedures and policies;
- facilitate access to molecular tools, generate more reliable characterization and evaluation data, and establish comprehensive, integrated and standardized information systems and national databases;
- promote a greater utilization of PGRFA with the involvement of farmers, and in particular enhance the use of landraces/farmers' varieties, traditional crops and neglected species, while adjusting breeding strategies, increasing pre-breeding and PPB, and establishing sound crop variety improvement programmes;
- provide greater access to sufficient quantities of seed, in particular in relation to minor crops, landraces and farmers' varieties;
- develop market incentives/market-based mechanisms and strengthen linkages between farmers and the market, as well as between conservation activities, breeding programmes and market strategies; and
- increase human and institutional capacities, as well as financial and material resources for the conservation and use of PGRFA.

These findings show that all four types of bottleneck and challenge engage with each other and are closely intertwined.<sup>4</sup> This suggests the need to develop a critical awareness of the complex interactions and synergies among the legal, political, institutional, technical, scientific, economic, social, marketing, cultural and environmental issues surrounding PGRFA conservation and use.

At the same time, the different ways in which the various challenges present themselves in each region highlights the need for greater attention to be paid by the global PGRFA community to the characteristics of each specific context at local, national and regional levels, in order to meet the challenges of climate change adaptation, food security and biodiversity loss.

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<sup>4</sup> 1) Legal, policy and institutional challenges; 2) Technical and scientific issues; 3) Seed distribution and marketing of landraces and farmers' crop varieties; and 4) Resource constraints.

**This background study therefore strongly recommends:**

- conducting a regular assessment of the gaps, needs and challenges in the conservation and sustainable use of PGRFA at regional/national level, in order to better evaluate progress in the implementation of Articles 5 and 6 of the International Treaty and help to determine opportunities for improvement and collaboration to address those issues;
- inviting a greater number of countries to submit their national report in order to enable a more comprehensive analysis of the gaps, needs and challenges in the conservation and sustainable use of PGRFA at regional/national level; and
- developing more country-/region-specific studies to address the poor implementation of Articles 5 and 6 of the International Treaty.