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Introduction

World's Bioversity for food and agriculture

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«Over recent decades, the importance of biodiversity to food security and nutrition, rural and coastal livelihoods and sustainable development more generally has gradually been acquiring greater recognition on international agendas.»

On 22 February 2019, at FAO was launched the first report on «The State of the World's Biodiversity for Food and Agriculture». It provides a comprehensive picture of the state and use of this biodiversity, thus providing a strong foundation for the design of effective interventions towards more sustainable, resilient food systems:

Biodiversity at genetic, species and ecosystem levels helps address the challenges posed by diverse and changing environmental conditions and socio-economic circumstances. Diversifying production systems, for example by using multiple species, breeds or varieties, integrating the use of crop, livestock, forest and aquatic biodiversity, or promoting habitat diversity in the local landscape or seascape, helps to promote resilience, improve livelihoods and support food security and nutrition.

1. CLIMATE CHANGE BRINGS NEW AND ENHANCED DEMAND FOR ALL GENETIC RESOURCES FOR FOOD AND AGRICULTURE.

Crop diversity, food security and climate change are closely linked in diverse and complex ways. In fact, we are facing a multi-faceted challenge requiring us to counter the loss of crop diversity and use crop diversity more effectively to achieve and maintain food security in the growing pressures of climate change. Agricultural crop varieties and the particular traits they contain form the very base of our food security. In this sense, crop diversity is a pre-condition for food security, so the challenge of food security cannot be met if crop diversity is not conserved.

New plant breeding strategies will therefore have to aim at improving economic and environmental sustainability by developing crop varieties that produce higher yields with less use of inputs, particularly those industrial in origin. All of this will place increased demands on the availability of a wide range of crop genetic material.

While climate change is one of the drivers of crop diversity loss, it is also an important reason to conserve agricultural crop varieties, exchange them and use them in a sustainable way.

But there is urgency to act: whereas climate change is occurring at a fast pace, the process for breeding a new crop variety may take from 7 to 15 years.

That is why traditional varieties in agriculture are important as a resource that can respond to imminent as well as unknown future challenges.

Therefore, traditional varieties form a reservoir of particular characteristics that may prove useful for the breeding of new varieties in terms of productivity, pest resistance, drought tolerance and other desirable traits. Meeting new and unexpected challenges will require increased and continuing exchange of crop genetic material for agricultural research and breeding.

2. IMPACTS AND IMPLICATIONS OF CLIMATE CHANGE FOR PLANT GENETIC RESOURCES

Although farmers have always adapted their cropping systems to adverse climatic and environmental conditions, the speed and complexity of current climate change poses problems of a new magnitude. Adapting crop varieties to local ecological conditions can reduce risk due to climate change, but the need for adapted germplasm is urgent and requires characterization, evaluation and the availability of materials now housed in gene-banks. The effort to breed for traits valued both today and for the future is likely to increase the general demand for PGRFA. Demand is also likely to increase for genetic resources of crop wild relatives. These genetic resources are being used to address both biotic and abiotic constraints. While demand for such genetic resources is global, their natural distribution is restricted to the centres of origin of crops, often specific sub-regions within continents.

That is why Agricultural development strategies which promote on-farm and in situ conservation are a dynamic form that provides a variety of germplasm options for farmers.

The International Treaty on Plant Genetic Resources for Food and Agriculture greatly promotes the conservation and utilization of plant genetic resources through a series of measures such as follow:

2.1. *The Farmers: custodians of biodiversity*

Farmers and other *in situ* custodians of local crop diversity play a critical role in the sustainable use of PGRFA for food, nutrition and economic security and provide a fundamental service to humanity. Diversity in plant genetic resources for food and agriculture (PGRFA) is essential to sustain food, nutrition and eco-

nomical security. To sustain this diversity, farmers and other crop maintainers that wish to diversify their own crops require an appropriate enabling environment, and adequate conservation management measures need to be implemented *in situ* (in protected areas and other natural or semi-natural sites) and in *ex situ* facilities.

Local crop varieties – also known as landraces or farmers' varieties – can be essential to the food, nutrition and economic security of many people – particularly smallholder farmers and farming communities in rural and marginal areas. The diversity in these varieties can provide insurance against crop failure and wide cropping windows, while the crop produce may be central to traditional local cuisine and specific dietary requirements. Furthermore, these diverse varieties are an important source of locally adapted genes for the improvement of other crops.

Despite the wide recognition of the importance of local crop varieties and the role of farmers and other crop maintainers in sustaining them, the enabling environment to advocate their continued cultivation has been eroded, partly due to the promotion and widespread adoption of high yielding uniform varieties. Many diverse local varieties have therefore been lost along with the knowledge associated with their cultivation and use.

Some relevant experiences have been made by the Community seed banks (CSBs), commonly established and managed by farming communities in collaboration with agro-NGOs or research institutes. In some countries, they may be associated with hobbyists or other communities, such as gardeners with an interest in heritage varieties. CSBs have been established in many countries to safeguard local crop varieties and to secure the seed supply for local communities. CSBs are important for local food security and empowerment of local communities, as well as for maintaining traditional knowledge and raising awareness of the value of local crop diversity.

2.2. *The value of smallholder farmers*

Supporting farmers in the creation of smallholder seed enterprises (SSEs) can lead to the stable production of quality seeds of local crop varieties, as well as improved livelihoods through increased income and diversification of farmers' activities. It is urgent to recognize and integrate 'informal' and 'formal' seed systems, as well as the public and private sectors, and promote entrepreneurship, private sector development, and the creation of new or strengthened markets for seeds and local crop produce.

The immense value of local crop diversity is not always fully understood or appreciated by the general public, policy-makers, local communities, and even by farmers and other crop maintainers. Inventories provide the baseline information needed to understand the local crop diversity that exists and the array of associated social, economic, geographic and environmental data. Increasing awareness of the value of local crops amongst farmers, communities, businesses, policy-makers and the public at large is an important ingredient in efforts to sustain crop diversity. Options include the establishment of farmers' associations and networks through which information and planting materials can be shared, the organization of diversity fairs, and the use of media (radio, television, popular press and the Internet) to promote local diversity and highlight special events.

3. CONCLUSIONS

The 40th Session of FAO Conference welcomed FAO's initiative to act as Biodiversity Mainstreaming Platform and requested FAO to facilitate, in collaboration with its partners, actions for the conservation, sustainable use, management and restoration of biological diversity across agricultural sectors at national, regional and international levels

It is still urgent to take concrete steps to meet the 2030 Sustainable Development Goals. The broader the genetic base we can rely on, the better equipped we are to adapt to changing climate conditions and to provide global food security.

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