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THE COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE (CGRFA): SPECIAL EVENT: THE CONTRIBUTION OF BIODIVERSITY FOR FOOD AND AGRICULTURE TO RESILIENCE: SATURDAY, 28 JANUARY 2017

The Commission on Genetic Resources for Food and Agriculture (CGRFA) organized this event on Saturday, 28 January 2017, ahead of its sixteenth session in Rome, Italy. Approximately 120 participants from government agencies, farmers, the private sector and civil society discussed how the biodiversity and ecosystem services on which agricultural production relies (farmed and non-farmed biodiversity) can also help protecting food production against the impact of long-term environmental changes and shocks created by natural and human-made disasters.

The group agreed to transmit several key messages to CGRFA 16, including the need for: better metrics for biodiversity and approaches to quantify the role of biodiversity and traditional knowledge for disaster risk reduction (DRR) and resilience; making genetic resource conservation an integral approach of agricultural resilience strategies; guidance on selecting, accessing and breeding appropriate genetic resources; more collaboration among agricultural sectors; investment in gene banks and breeding for DRR; and awareness raising. Participants also underlined that heterogenous landscapes provide better buffers in case of disasters because they deliver a wider variety of ecosystem services.

OPENING REMARKS

Sally Berman, Office of Partnerships, Advocacy and Capacity Development, Food and Agriculture Organization of the UN (FAO), welcomed participants, noting that the outcomes of the discussion will feed into CGRFA 16 and the State of the World report on Biodiversity for Food and Agriculture.

René Castro, Climate Biodiversity, Land and Water Department, FAO, called for better coordination of farm and non-farm natural resource management, using agro-ecology and hydro-meteorology as tools to enhance resilience of food production and ensure the food security of vulnerable farmers, fishers, herders and other at-risk groups.

The Global Context for Resilience: Charles Godfray, Oxford University, called for greater attention to fruit and vegetables, which have been less researched than staple crops but will be most affected by climate change. He observed that genetically-diverse agricultural systems are relevant for genetic resource conservation in low-income countries, whereas germplasm conservation is more relevant in high-income countries. On potential declines in rice yield in Southeast Asia due to crop epidemics, he noted that trade can currently make up for projected losses, but that resilience is a backstop in case trade mechanisms should fail in the future.

In response to questions, Godfray said gene-editing technology could work well for vector control in pest management in developing countries, noting that it should be considered a "public-good technology." He suggested that private foundations and governments support the development of gene-editing, while holding extensive consultations with civil society.

FAO Resilience Strategic Programme and the Contribution of Biodiversity for Food and Agriculture in Emergencies and to Resilience: Sylvie Wabbes, Strategic Objective 5 (Increase the resilience of livelihoods to threats and crises) Team, FAO, stressed the need to support smallholders who depend on agriculture. She discussed effects of conflicts on agricultural systems and related institutions, and underscored the shift from managing response to managing risk ahead of shocks. She then outlined the framework's focus on disaster-risk governance, early-warning systems including biological and genetic resources, vulnerability measures at community level, and links to humanitarian and emergency response and preparedness. Participants discussed how to support smallholders to reduce their vulnerability, and investing in prevention rather than crisis response.

SESSION 1: BIODIVERSITY FOR FOOD AND AGRICULTURE: AN ISSUE FOR EMERGENCY RELIEF?

This session, moderated by Nora Berrahmouni from FAO's Forestry Department, focused on the short-term aspects of the contributions of biodiversity to resilience.

Seed Aid, Plant Genetic Resources (PGR) and Resilience: Shawn McGuire, Plant Production and Protection Division, FAO, underscored that diversity is key in plant genetic resource (PGR) conservation, noting challenges in access to seed material and to related knowledge. He explained that seed aid typically involves few crop varieties, noting that diversity is constrained by seed sector supply, quality and logistical concerns. He further emphasized that aid should be based on timely seed system assessments and preparedness for resilience.

Participants commented on, *inter alia*: the need to strengthen informal national seed systems and build capacities within communities; special regional circumstances, including soil salinity; utilization of farmers' own seeds; and challenges associated with access and knowledge regarding commercial seeds.

Animal Disease Control and Conservation and Sustainable Use of Animal Genetic Resources (AnGR) in Emergencies: Etienne Bonbon, World Organization for Animal Health (OIE), discussed contagious animal diseases, control methods in emergencies, animal welfare and biodiversity considerations, and existing international tools. He highlighted that unprecedented movements of commodities and people, climate change and

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human behaviour provide new pathways for pathogens to colonize the whole planet, noting that 60 percent of known human pathogens are zoonotic.

One participant noted the loss of AnGR due to breed specialization.

Emergency Responses, Rehabilitation in Fisheries and Aquaculture, and the Conservation and Sustainable Use for Aquatic Genetic Resources (AqGR): Florence Poulain, Fisheries and Aquaculture Department, FAO, described how pollution, aquatic diseases and natural hazards, such as drought, storms and floods, lead to a decline in capture fisheries and aquaculture. She highlighted that aquatic biodiversity represents a coping strategy for small-scale farmers and fishers, which serves as a "sector of last resort" by providing income, dietary protein and the micronutrients essential for children and pregnant women. She noted that FAO's emergency responses, such as replacing fishing gear, repairing fishing vessels and replacing aquaculture seed, must avoid increasing pressure on the environment or over-exploiting fisheries.

Forest Emergency Relief, Risk Management, and the Conservation and Sustainable Use of Forest Genetic Resources (FGR): Moctar Sacande, Coordination and Technical Support, FAO, described forest restoration approaches in drylands used to build community prosperity and resilience. He highlighted community participation to assess commitments and needs and preferences, not only in terms of trees, but also for fodder. He highlighted research on species authentication and species comparison at the farmer's field level, noting that the growth speed of native and exotic species is not the only factor to consider.

Discussion: Participants emphasized the importance of: fish diversity; landrace preservation; locally adapted seeds; invasive alien species, including in small island developing States (SIDS); fish breeding to recover after heat stress; and institutional capacities and policies at different levels to orient assistance and cooperation efforts. Panelists also noted the need for economic tools, such as insurance, and national incentives for retaining some seeds for replanting.

Irene Hoffmann, CGRFA Secretary, summarized the session, emphasizing, biodiversity as a tool for a purpose, not an end; human mismanagement of ecosystems; the urgency to deal with short-term crises, while also addressing synergies and trade-offs; community involvement; the need for innovation on technologies and delivering mechanisms; and preparedness and availability of tools.

SESSION 2: BEYOND EMERGENCY RELIEF: BIODIVERSITY FOR FOOD AND AGRICULTURE IN A CONTEXT OF CHANGES AND CRISES

This session, moderated by Sally Berman, Office for Partnerships, Advocacy and Capacity Development, FAO, focused on the long-term aspects of the contributions of biodiversity to resilience.

Ecosystem-based Approach to Disaster Risk Reduction (DRR): Karen Sudmeier-Rieux, Institute of Earth Sciences, University of Lausanne, noted that biodiversity loss and ecosystem collapses were identified by the Davos Economic Forum as among the most important global risks. She highlighted that genetic diversity reduces vulnerability to climate extremes, and underscored the opportunity for a global uptake of 'Eco-DRR,' which brings forth various benefits, including biodiversity conservation and stabilization of regional climate.

Participants discussed: efforts to develop guidelines on the benefits of biodiversity to DRR; moving from engineering-based solutions to Eco-DRR; and the potential of *ex situ* gene banks to address disasters.

FAO: Environmental and Social Management Guidelines and Biodiversity for Food and Agriculture: Mark Davis, Climate and Environment Division, FAO, explained that FAO's environmental and social safeguards system enables a risk mitigation hierarchy while promoting sustainable food systems. He described how the system helps project formulators and implementers to evaluate projects, identify risks and suggest ways forward based on best practices.

Participants discussed, among other issues: whether microbes, invertebrates and FGR are included in the list of safeguards; whether the related measures apply to all FAO projects; and involvement of local communities in risk assessments.

Post-cyclone use of PGR: William Wigmore, Ministry of Agriculture, Cook Islands, described reduction in land-use for agriculture due to urbanization and out-migration. Noting increased severity of tropical cyclones, he called for better cooperation among agriculture, environment and disaster response agencies, and encouraged countries to learn from Fiji and Vanuatu's post-cyclone experiences.

Responding to a question on farmers' participation in post-cyclone recovery plans, Wigmore noted provision of seeds and planting material by farmers from outside affected areas. Participants also noted collaboration on multi-country gene pools, and national investments in cyclone-resistant varieties.

Mexico: Diversification and Resilience in the Dry Corridor: Hesiquio Benitez, Mexican Commission for the Knowledge and Use of Biodiversity (CONABIO), presented the Mesoamerican Biological Corridor experience. He highlighted the recognition of smallholder farmers, both indigenous and non-indigenous; the promotion of social entrepreneurship; and the incorporation of biodiversity values. Noting the importance of inter-ministerial collaboration, he stressed a recent agreement between the environment and agriculture ministries to align subsidies in favor of biodiversity.

On a question on the costs and benefits of the biological corridor, Benitez highlighted, among others, the use of information systems, and the analysis of communities' satisfaction and incomes.

The State of the World's Biodiversity for Food and Agriculture (SoW-BFA): Julie Bélanger, CGRFA Secretariat, explained how resilience is addressed in the SoW-BFA, noting it is country-driven and follows an ecosystem service framework. Bélanger said preliminary findings include: the importance of increasing diversity in production systems to enhance resilience; that biodiversity supplies many ecosystem services that underpin food and agricultural production; and the increased use of management practices regarded as favorable to biodiversity.

Discussion: Participants discussed messages to CGRFA 16 including: avoiding excessive prescription and legislation; providing examples, ideas and solutions that can be implemented; involving people who are directly affected; giving special attention to SIDS; and avoiding the polarization of ecological and agricultural interests. Delegates also discussed the value of the multifunctional ecosystem concept applied to disaster risk management; the integration of holistic public policies on seeds; and cultural changes, such as urbanization, leading to a loss of knowledge.

Panelists suggested, *inter alia*: investing in disaster-resistant crops; considering the multifunctionality of landscapes; addressing biodiversity conservation and adaptation to climate change in a holistic way; introducing policies for seed conservation; maintaining healthy soils, ecosystems and diets; and including the FAO platform on biodiversity mainstreaming in the Multi-year Programme of Work.

CLOSING REMARKS

Irene Hoffmann, CGRFA Secretary, said knowledge gaps, including on traditional knowledge, should be closed or better documented. She noted interest in multifunctional and integrated landscape approaches and agreement on the need for cross-sectoral collaboration, which she proposed considering in the context of the Sustainable Development Goals (SDGs). She raised the question of how large-scale farmers can also increase resilience, and recognized the need to increase investments.

Sally Berman thanked participants and closed the event.