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para la  
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Agricultura

# COMMISSION ON GENETIC RESOURCES FOR FOOD AND AGRICULTURE

## Item 2.3 of the Provisional Agenda

### Fourteenth Regular Session

Rome, 15 – 19 April 2013

## SELECTED PROCESSES AND INITIATIVES ON CLIMATE CHANGE OF RELEVANCE TO GENETIC RESOURCES FOR FOOD AND AGRICULTURE

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## I. INTRODUCTION

1. This document compiles information on processes and initiatives related to genetic resources for food and agriculture and climate change. It describes FAO's activities in this field and provides an overview of some of the main international climate change-related processes and initiatives relevant to genetic resources for food and agriculture. The information presented is not exhaustive. More details and examples could be provided for each of the processes and initiatives described. The intention is to present an overview of the complex mosaic of processes and initiatives with which the Commission on Genetic Resources for Food and Agriculture (the Commission) will need to liaise in the implementation of the Roadmap on Climate Change and Genetic Resources for Food and Agriculture.<sup>1</sup>

## II. FAO'S WORK ON CLIMATE CHANGE AND GENETIC RESOURCES FOR FOOD AND AGRICULTURE

2. Challenges associated with food security and climate change need to be addressed in a holistic and coherent manner. FAO has been a global leader in raising awareness of the impacts of climate change on agriculture, fisheries, forestry and food security, and in assisting member countries to take action to address these impacts. FAO's work on climate change covers a broad spectrum of activities, ranging from local to global and from actions addressing immediate problems to long-term strategies. It provides a forum for technical discussions and it provides policy advice related to adaptation and mitigation practices. It recognizes that, in many cases, traditional agriculture has the potential to help reduce the impacts of climate change. In its work on climate change, FAO is committed to an ecosystem approach that embraces agriculture, forestry and fisheries.<sup>2</sup>

3. FAO's main overarching programmes on climate change are the Climate-Smart Agriculture (CSA) initiative, the FAO-Adapt framework and the Mitigation of Climate Change in Agriculture programme. FAO is a partner in the United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries. It maintains a web site that provides examples of climate-smart practices. It also makes available a wide range of data and tools for use in assessments of climate change impacts and vulnerabilities and in planning adaptation and mitigation measures related to agriculture and food security. One example of such a tool is the *Ex Ante* Appraisal Carbon-balance Tool,<sup>3</sup> which provides *ex ante* estimations of the impact of agriculture and forestry development projects on greenhouse gas (GHG) emissions and carbon sequestration.

### Climate-Smart Agriculture

4. The CSA initiative,<sup>4</sup> promoted by FAO along with other partners, aims to promote agriculture that *sustainably increases productivity and resilience (adaptation), reduces GHG and increases carbon sequestration (mitigation), while enhancing the achievement of national food security and development goals*. The CSA approach recognizes that agriculture suffers from the effects of climate change, is responsible for a substantial proportion of global GHG emissions (an estimated 14 percent) and has the potential to make a significant contribution to climate change mitigation. It recognizes that *a more productive and resilient agriculture will need better management of natural resources, such as land, water, soil and genetic resources through practices, such as conservation agriculture, integrated pest management, agroforestry and sustainable diets*.

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<sup>1</sup> The Roadmap is presented in document CGRFA-14/13/5.

<sup>2</sup> FAO. 2009. *FAO profile for climate change*. Rome (available at <ftp://ftp.fao.org/docrep/fao/012/i1323e/i1323e00.pdf>).

<sup>3</sup> <http://www.fao.org/tc/exact/en/>

<sup>4</sup> <http://www.fao.org/climatechange/climatesmart/en/>

5. Although there is consensus on the need to promote CSA, it is recognized that the ability of actors (farm smallholders, policy makers and development agencies) to implement climate smart actions successfully is hindered by gaps in some areas of knowledge and by a lack of adequate methodologies, policies and financial resources. The programme on Economics and Policy Innovations for Climate-smart Agriculture (EPIC) was initiated to address some of these gaps and to support the transition to CSA. EPIC works with national and local partners in developing countries (Malawi, Viet Nam and Zambia), to build evidence-based agricultural-development strategies, policies and investment frameworks. EPIC is designed to work with existing policy instruments, such as the Comprehensive Africa Agriculture Development Programme and other national sectoral plans, as well as with emerging policy instruments, such as the National Adaptation Plans (NAPs) and Nationally Appropriate Mitigation Actions (NAMAs) of the United Nations Framework Convention on Climate Change (UNFCCC), to enhance the capacity of these instruments to support CSA at national level. Work at the international level involves providing submissions, briefs and presentations highlighting key issues of relevance to CSA. EPIC focuses on four main areas:

- 1) assessing synergies and trade-offs between food security, adaptation and mitigation in smallholder agriculture transitions;
- 2) assessing the institutional basis for the adoption of CSA;
- 3) national planning processes (to build national policy frameworks supporting CSA investments); and
- 4) international processes (UNFCCC negotiations, Rio+20 follow-up, Committee on World Food Security).<sup>5</sup>

6. FAO is presently leading the preparation of a source book, with the provisional title *Transitioning to climate-smart agriculture, forestry and fisheries*, which will aim to provide a clear definition of the CSA concept, demonstrate its potential and its limitations, and improve decision-makers' understanding of planning, policy, investment and practical options that can contribute to the transformation of agricultural sectors, landscapes and food systems to CSA. The Secretariat of the Commission is contributing a chapter on genetic resources for food and agriculture.

## FAO-ADAPT

7. FAO-Adapt<sup>6</sup> is an organization-wide framework programme that provides guidance and support to FAO's multidisciplinary activities on climate change adaptation. It provides an umbrella for FAO's activities in this field, including short-term and long-term adaptation measures. It aims to enhance the coordination, efficiency and visibility of FAO's adaptation work. In general, the framework aims to promote sustainable increases in production while also promoting resilience to the current and future effects of climate change. FAO-Adapt is aligned to the immediate priorities of member countries outlined through UNFCCC.

8. FAO-Adapt highlights the importance of *in situ* and *ex situ* conservation and sustainable use of genetic resources in increasing the resilience of production systems to the effects of climate change. It also highlights the importance of incorporating responses to the effects of climate change on biodiversity into national agricultural, forestry and fisheries policies and strategies. FAO-Adapt recognizes that climate change will further increase the interdependence of countries and the need for international collaboration in, for example, accessing the genetic resources needed for adaptation to new climatic conditions. This is reflected in FAO-Adapt's core principles and priority themes.

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<sup>5</sup> <http://www.fao.org/climatechange/epic/en/>

<sup>6</sup> FAO. 2011. *FAO-Adapt framework programme for climate change adaptation*. Rome (available at <http://www.fao.org/climatechange/27770-0ba6e09830f810e06a05c65891425e8ed.pdf>).

9. FAO-Adapt has adopted the following nine core principles,<sup>7</sup> which guide FAO's work on climate change adaptation in agriculture, forestry and fisheries.

- Reduce climate change vulnerability: Vulnerability to climate change threatens food security around the world. Rural communities and impoverished groups are often hit hardest. Reducing climate change vulnerability is essential to fighting extreme poverty and hunger. Adaptation efforts must also support environmental sustainability, which is essential to achieving food security and alleviating poverty in the long term.
- Mainstream climate change into development planning: Adaptation must be integrated into overarching developmental support. Integrating adaptation into development planning translates into far-reaching benefits and plugs into holistic, climate change approaches.
- Support country-driven processes: Climate change adaptation must be driven by the specific needs of individual countries.
- Build synergies between adaptation and mitigation: Dealing with climate change means developing comprehensive solutions that: link adaptation and mitigation; and combine strategic, policy, institutional and technical options.
- Promote an ecosystem approach: Food production must be considered in parallel with: ecosystem capacity and resilience; equity in access to resources; and integration of sectors that use common resources.
- Design participatory, gender-sensitive and location-specific activities: Adaptation is people-centric. In order to see benefits, efforts must be based on local contexts and rooted inequitable and participatory approaches.
- Deliver through partnerships; Climate change adaptation is a global issue requiring committed partnerships. Member countries, UN agencies, national and international research and financing institutions, bilateral donors, civil society organizations and the private sector must work together to support adaptation.
- Support international, regional and national collaboration: Climate change increases global resource interdependence. Managing shared resources collaboratively is therefore essential.
- Develop a long-term programmatic approach: Adaptation efforts must be streamlined into priority themes and actions to ensure consistent, long-term progress.

10. FAO-Adapt consolidates five global priority themes and related actions that support global adaptation needs in the agriculture, forestry and fisheries sectors.

- Data and knowledge for impact and vulnerability assessment and adaptation: To help countries deal with vulnerabilities to climate change, FAO works with decision makers to design new ways of assessing vulnerabilities; and planning adaptation strategies. FAO helps countries put climate information into practice, emphasizing information-sharing to encourage member countries' participation in and ownership of adaptation actions.
- Institutions, policies and financing to strengthen capacities for adaptation: Climate change impacts are uncertain. Institutional arrangements need to be flexible if climate change adaptation is going to have a chance to work. FAO-Adapt accesses FAO's wide-ranging expertise to find adaptation solutions not only in agriculture, but also in forestry and fisheries. Moreover, FAO has been working to ensure community-based approaches are integrated into adaptation strategies.
- Sustainable and climate-smart management of land, water and biodiversity: Sustainable and adaptive natural resources management can be critical to climate change adaptation. For this reason, FAO fosters land-use planning, soil and water management and biodiversity conservation. FAO has been spearheading efforts to monitor natural resource

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<sup>7</sup> *FAO Adaptation in action: FAO's work in climate change adaptation* (available at <http://www.fao.org/docrep/017/i2867e/i2867e.pdf>).

and biodiversity trends, integrate biodiversity into policy and promote tools and incentives that encourage the climate-smart management of land, water and biodiversity. Specifically FAO has been promoting conservation agriculture, which helps farmers achieve significantly larger yields with relatively fewer means.

- Technologies, practices and processes for adaptation: Climate change adaptation can only be successful when theory and practice are intertwined. This is why FAO supports the development and dissemination of adaptation-related technologies, practices and processes in a variety of key areas, including: agriculture; forestry; fisheries; value chains; rural energy; rural income diversification; and conservation. FAO places particular emphasis on ensuring that women have equal access to technologies.
- Disaster risk management: Areas under frequent threat of climate-related emergencies are often where adaptation initiatives can make the biggest difference. By integrating adaptation and disaster risk reduction and management strategies, FAO helps countries prevent and reduce hazard impacts on farmers, forest users and fisher folks helping communities build resilience to confront climate change threats.

### **Mitigation of Climate Change in Agriculture**

11. The objective of the Mitigation of Climate Change in Agriculture (MICCA) Programme<sup>8</sup> is to support developing countries' contributions to climate change mitigation in agriculture by promoting CSA practices and policies. MICCA is a multidisciplinary programme operating in various FAO departments and collaborating with other international organizations and with national organizations. A variety of activities are promoted under the MICCA umbrella. These aim to support policy and decision making, as well as to provide input to international negotiations on climate change. MICCA is developing a database on GHG emissions from agricultural activities, which will provide comparable global and country-level data. It is also building capacity at country level to report on emissions. The GHG database will enhance FAO's ability to advise its member countries on climate change mitigation, while linking mitigation options to rural development and food security goals. Life-cycle analyses quantifying GHG emissions from the entire agricultural production chain have been carried out for the livestock sector. A methodology has been developed for calculating how much GHG is emitted along the entire production chain of products such as milk, meat and eggs. A methodology for obtaining cost-effective and robust measurements of soil carbon sequestration from the restoration of degraded grasslands has also been developed, based on a pilot study in Qinghai, China. This methodology should increase herders' access to carbon markets to help fund grassland-restoration activities.

12. Two further pilot projects, in Kenya and the United Republic of Tanzania, aim to contribute to climate change adaptation and mitigation, while also supporting an increase in the productivity of smallholder farming practices. The projects will provide quantifiable evidence of how CSA practices can mitigate climate change, improve farmers' lives and make local communities better able to adapt to climate change. A comprehensive review of mitigation options for the livestock sector, citing over 900 published studies, has recently been completed – it is the most detailed study of its kind and a journal paper version is to be used in the upcoming fifth assessment report by the International Plant Protection Convention. With regard to the economics of mitigation policies, a comprehensive global assessment of the economic and food security impacts of market-based policies in agriculture and forestry has been completed and recently published.<sup>9</sup>

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<sup>8</sup> <http://www.fao.org/climatechange/micca/en/>

<sup>9</sup> Golub *et al.* 2012. Global climate policy impacts on livestock, land use, livelihoods, and food security. *PNAS* (available at <http://www.pnas.org/content/early/2012/09/26/1108772109>).

## Plant genetic resources for food and agriculture

### *The Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture*

13. *The Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture* (GPA) recognizes that climate change, among other challenges, requires that greater attention be given to the conservation and use of plant genetic resources for food and agriculture (PGRFA). It highlights the fact that in many parts of the world, the effects of climate change are likely to involve changes in the adaptability of many crops and forages and that PGRFA underpin the ability of agriculture to cope with such changes. The GPA includes the following elements aimed at safeguarding PGRFA and using them optimally to provide options for use in climate change adaptation and mitigation:

- Greater emphasis on *in situ* conservation of genetically diverse populations, especially crop wild relatives (CWR), to allow evolution to continue and thus permit the continued generation of adaptive traits;
- A significantly expanded programme on *ex situ* conservation, especially of CWR, to ensure the maintenance of diversity of species, populations and varieties, including those adapted to extreme conditions and those from areas expected to be highly affected by climate change;
- Increased research and improved availability of information on the characteristics of material held *ex situ* that will become useful under new climatic conditions;
- Increased support for access to and movement of PGRFA to meet the greater interdependence of countries resulting from new environmental conditions;
- More support for building capacity in plant breeding and seed-systems management that make effective and sustainable use of PGRFA;
- Targeted and increased involvement of farmers and farming communities in national and local crop-improvement activities, including support for participatory research and plant breeding.

### *Crop wild relatives*

14. Recognizing the importance of CWR as sources of new traits for plant breeding, FAO promotes their *in situ* conservation. Priority actions for promoting *in situ* conservation and management of CWR and wild food plants are also identified within the GPA's priority area *In Situ* Conservation and Management.

15. The Commission, at its Thirteenth Regular Session, reiterated the need to give greater attention to crops essential for food security and to on-farm management of PGRFA. It recognized the importance of establishing a global network for *in situ* conservation and on-farm management of PGRFA. FAO has continued to strengthen its collaboration with regional partners in Europe, Asia and Latin America through technical consultations and projects promoting the conservation and use of CWR and local crop diversity. One such example is the collaboration with the European regional collaborative project PGR Secure,<sup>10</sup> which aims to research novel characterization techniques and conservation strategies for European CWR and landrace diversity, and enhance crop improvement by breeders, with the aim of promoting European food security in the face of climate change.

16. A toolkit for *in situ* conservation of crop wild relatives and on-farm management, which also addresses climate change issues and which will provide countries with means and methods for strengthening national programmes, is under preparation.<sup>11</sup> With regards to the potential for a global network, a technical workshop conducted in November 2013 to discuss the establishment of a

<sup>10</sup> <http://www.pgrsecure.org/>

<sup>11</sup> Tentatively titled *Tools and guidelines for in situ conservation and on-farm management of plant genetic resources for food and agriculture*.

platform for raising awareness of the social and economic value of *in situ* conservation of crop wild relatives and on-farm management, increasing funding for the sector, promoting knowledge sharing and partnerships, and playing a facilitating role in the coordination of the many ongoing initiatives in this area.<sup>12</sup>

17. At its Sixth Session, the Intergovernmental Technical Working Group on Plant Genetic Resources for Food and Agriculture, reiterated the importance of the above-mentioned needs and called upon the Commission to take into account the work that had been done with respect to its request regarding the exploration of mechanisms for establishing a global network and recommended that the Commission request FAO to develop a concept note on the possible structure and functions of such a network and its financial implications, taking into account the need to strengthen national and regional networks, for submission to the Commission at its Fourteenth Regular Session.<sup>13</sup>

#### *International Treaty on Plant Genetic Resources for Food and Agriculture*

18. The International Treaty on Plant Genetic Resources for Food and Agriculture (Treaty) is the only legally binding international instrument governing agricultural biodiversity for food security. It aims to promote the conservation and the sustainable use of PGRFA, facilitates their exchange for research and for the breeding of new varieties, and ensures that the benefits that arise from the utilization of these genetic resources are shared in a fair and equitable way. The Governing Body of the Treaty is responsible for the establishment and the management, collectively and multilaterally by Contracting Parties, of the Treaty's Multilateral System of Access and Benefit-Sharing (MLS). The MLS already provides a global gene pool of more than 1.5 million samples of plant genetic material that constitutes the basis for more than 80 percent of the world's plant-derived food. The MLS is considered one of the most important tools for adapting agriculture to climate change.

19. The thematic focus of the Treaty's Benefit-sharing Fund is to enhance sustainable food security by assisting farmers to adapt to climate change. This thematic focus was initiated with the Fund's second Call for Proposals, launched in 2010. The Benefit-sharing Fund supports developing countries in the strategic planning of measures to address climate change through the management of PGRFA and in implementing immediate actions such as practical field initiatives to promote adaptation to climate change. The funds disbursed in the second round of the project cycle were ten times greater than those disbursed in the first round (US\$5,497,723 vs. US\$543,000). More than 100 organizations are involved in the implementation of the second round of the project cycle in more than 36 countries. The projects are reaching communities that are facing food insecurity because of the impact of climate change on the use and conservation of their PGRFA. The Governing Body is developing a mid-term plan for benefit-sharing, which will keep the thematic focus on climate change adaptation. The third Call for Proposals is expected to be issued during 2013 and will maintain the focus on climate change adaptation, including by adding a new funding window related to technology transfer.

#### *Save and Grow*

20. In many countries, intensive crop production has depleted agriculture's natural resource base, jeopardizing future productivity. The challenge of food security and nutrition is made even more daunting by the combined effects of climate change and growing competition for land, water and energy. FAO's publication *Save and Grow*<sup>14</sup> argues that sustainable crop production intensification is possible. It illustrates a new paradigm which produces more from the same area of land while also

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<sup>12</sup> Report available at <http://www.fao.org/agriculture/crops/core-themes/theme/seeds-pgr>

<sup>13</sup> CGRFA/WG-PGR-6/12/REPORT, paragraph 16.

<sup>14</sup> FAO. 2011. *Save and grow – a policy maker's guide to the sustainable intensification of smallholder crop production*. Rome (available at <http://www.fao.org/ag/save-and-grow/>).

conserving resources, reducing negative impacts on the environment and enhancing natural capital and the flow of ecosystem services.

21. While focussing mainly on crop production, the *Save and Grow* approach is very inclusive and is based upon a holistic approach, and foresees the integration of good agricultural practices related not only to the farming systems, but also to soil health, to the use of the appropriate crop varieties, to water management, plant protection, policy and institutions.

22. Consistently with this approach, a genetically diverse portfolio of crop varieties, suited to a range of agro-ecosystems and farming practices, and resilient to climate change is vital to sustainable production intensification. Crop diversification and crop improvement, therefore, are important elements of a resilient system. This implies the utilization of the full range of PGRFA (including underutilized crops and neglected species) conserved and utilized *ex situ*, on-farm and *in situ*, discovering their beneficial traits, managed/planted in a judicious way, and, as appropriate, also combining them into varieties that are adapted to changed climatic conditions.

### **Aquatic genetic resources for food and agriculture**

23. FAO's strategy for fisheries, aquaculture and climate change<sup>15</sup> provides an overarching structure for wider partnership-based development activities in these fields. The *goal* of the programme is to enable people, communities and states to meet their social and development objectives effectively while responding to the additional challenges imposed by climate change. The *purpose* of the programme is to support countries and partners in their efforts to mitigate climate change and adapt to its impacts on fisheries, aquaculture and aquatic ecosystems through policy development, knowledge development and exchange, normative outputs, practical demonstrations and capacity building.

24. The key operational objectives of FAO's strategy for fisheries, aquaculture and climate change are:

- Set up and develop global, regional and local climate change action partnerships across public, private, community and NGO sectors to support regional and subregional cooperation and to develop interregional and global policy and management initiatives within the sector.
- Establish the knowledge base for local, national and international policy development for climate change and the fisheries and aquaculture sector; specifically, to raise awareness of the importance of the sector with respect to climate change mitigation and adaptation, its contribution to the Millennium Development Goals (MDGs), the vulnerability of its communities at various scales, and the ways in which climate change responses can be developed.
- Identify and develop climate change mitigation actions for the fisheries and aquaculture sector at the global, regional and national levels; support their implementation within and across the sectors; and identify resources to support prioritized actions.
- Identify and promote effective climate change adaptation strategies within fisheries and aquaculture sector development frameworks at the global, regional and national levels, and identify resources to support prioritized actions at all levels.
- Initiate lesson-learning and capacity-building processes with partners to establish more effective climate change and sectoral knowledge and response through specific tools, such as the development of strategies and best practices.
- Develop and implement a communication strategy for climate change mitigation and adaptation for a range of audiences and develop a coordinated approach to global planning and feedback.

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<sup>15</sup> FAO. 2011. *Strategy for fisheries, aquaculture and climate change*. Rome (available at [ftp://ftp.fao.org/fi/brochure/climate\\_change/strategy\\_fi\\_aq\\_climate/2011/climate\\_change\\_2011.pdf](ftp://ftp.fao.org/fi/brochure/climate_change/strategy_fi_aq_climate/2011/climate_change_2011.pdf)).



25. FAO's objectives for aquatic genetic resources include increasing the adaptive capacity of fisheries and aquaculture-dependent communities and decreasing the sector's carbon footprint through the promotion of improved management practices. The main areas of activities are:<sup>16</sup>

- Collecting and disseminating data and information on the impacts of climate change on fisheries, aquaculture and dependent livelihoods;
- Developing and disseminating guidelines to promote ecosystem approaches to fisheries and aquaculture, integrated coastal management, and adaptive management under uncertainty;
- Providing technical guidance on appropriate fisheries and aquaculture technologies (e.g. resistant species) and integrated agriculture (e.g. pisciculture);
- Advocating the importance of the sector to livelihoods and food security;
- Assisting in the development of national and regional climate change and food security strategies, priorities and policies; and
- Assisting in supporting cross-sectoral coordination (technical, social, political, legal, and institutional).

#### *Global Partnership for Climate, Fisheries and Aquaculture*

26. In 2009, FAO, in partnership the Global Partnership for Climate, Fisheries and Aquaculture (PaCFA), formed a voluntary grouping of 20 international organizations and sector bodies sharing a common concern about the interactions of climate change with global waters and living resources and their social and economic consequences. To support the process of the United Nations Framework Convention on Climate Change (UNFCCC) in response to the need for concerted action on fisheries, aquaculture and climate change, PaCFA prepared ten key messages.<sup>17</sup> Recognizing the importance of aquatic ecosystems and their products and services for human livelihoods and that climate change will cause unprecedented disruptions to aquatic and coastal systems, the messages from PaCFA emphasized the point that “*oceans and aquatic ecosystems are key in regulating the world's climate – they are resilient but at increasing risk*” and that “*oceans and aquatic ecosystems are our largest natural carbon sink – we must keep them healthy to absorb our emissions.*” Oceanic dead zones, acidification, disturbed freshwater processes, falling groundwater levels and pressure on aquatic stocks were identified as changes that need to be better understood and addressed wisely. Good stewardship and new patterns of global partnership were also highlighted.

## **Animal genetic resources for food and agriculture**

### *Livestock and climate change*

27. Climate change adds to the many challenges already facing the livestock sector. Its effects will be most acute in developing countries, where the increase in food demand is expected to be greatest and to occur at a rate faster than increases in production. Climate change and the specific associated challenges (high temperatures, modified precipitation regimes, increased frequencies of extreme events, disruptions to feed supplies, disease outbreaks, etc.) are likely to create problems in many areas of animal husbandry (housing, feeding, health care, etc.). Indirect impacts of climate change may manifest themselves via ecosystem changes that alter the availability of feed resource in land-based production systems or affect the epidemiology of animal diseases. However, the livestock sector, which is a large contributor to GHG emissions, also offers significant adaptation and

<sup>16</sup> <http://www.fao.org/climatechange/49378/en/>

<sup>17</sup> PaCFA. 2011. *Strategic framework for fisheries, aquaculture and climate change: a proposal by the Global Partnership Climate Change, Fisheries and Aquaculture (PaCFA)* (available at [ftp://ftp.fao.org/FI/brochure/climate\\_change/pacfa/pacfa.pdf](ftp://ftp.fao.org/FI/brochure/climate_change/pacfa/pacfa.pdf)).

mitigation potential. There are potential means by which the sustainable use of animal genetic resources can be integrated within climate change mitigation and adaptation strategies.

28. The importance of well-adapted animals is likely to increase under climate change. Heat tolerance is an important physiological trait that depends on complex interactions among anatomical and physiological factors. High thermal resistance has a physiological cost in terms of lower performance in non-stressed environments. In addition to thermoregulation, the ability to walk to scarce feed resources, to rehydrate efficiently, to selectively graze or browse higher-quality plant material and to avoid high temperatures by grazing at night all play a role in adaptation to climate change, as does, rumen physiology and even genetic aspects of diet selection. Breeds are known to differ with regard to their ability to survive, grow and reproduce in the face of poor seasonal nutrition, parasites and diseases; they vary in their ability to mobilize body resources to cope with periodic underfeeding and cease reproduction at different levels of body weight loss. As part of a study conducted in 2006, FAO defined 1074 breeds as being adapted to drylands.<sup>18</sup> In Africa, 56 percent of total breed diversity is adapted to drylands, 42 percent in Asia and 19 percent in Latin America. Another study found that a large share of breeds that are adapted to steppe, mountainous and arid/semi-arid areas are also adapted to wide temperature ranges and have the ability to cope with poor quality fodder. However, most of these locally adapted breeds are not sufficiently well characterized to allow for their inclusion in structured breeding programmes.

#### *The Global Plan of Action for Animal Genetic Resources*

29. The Global Plan of Action for Animal Genetic Resources recognizes climate change as an enormous challenge to efforts to address the needs of a growing population and that the adaptability of genetic resources will be important in an uncertain future.

30. Effective implementation of the Global Plan of Action would be an important step towards improving the capacity of the animal genetic resources (AnGR) sector, and the livestock sector more broadly, to respond to climate change – knowledge, availability (sustainable use, conservation and exchange) and strategies for use and development of AnGR would all be strengthened. While few aspects of improved AnGR management are relevant only in the context of climate change, certain policy and management measures stand out as being particularly significant. These include the following (grouped according to their relevance to the four strategic priority areas of the *Global Plan of Action*):

Strategic Priority Area 1. Characterization, inventory and monitoring of trends and associated risks

- developing methods for characterizing adaptive traits relevant to climate-change adaptation (heat tolerance, disease resistance, adaptation to poor diet, etc.) and for comprehensive evaluation of performance and use of animals in specific production environments and describing these production environments in a standard way;
- incorporating the above techniques into phenotypic characterization studies and AnGR surveys;
- improving knowledge and awareness of, and respect for, local and indigenous knowledge relevant to climate-change adaptation and mitigation;
- identifying potential climate change-related threats to specific AnGR, ensuring that long-term threats (e.g. gradual environmental changes) are monitored and that urgent action is taken to address immediate threats (e.g. small populations at severe risk from climatic disasters);
- exploring the possibility of modelling the future distribution and characteristics of production environments, to support the assessment of threats and the identification of areas that may be suitable for particular breeds in the future;

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<sup>18</sup> CGRFA/WG-AnGR-4/06/Inf. 9.

- improving knowledge of breeds' current geographical distributions to support the above actions and to facilitate planning of climate-change adaptation measures and AnGR conservation strategies;
- improving the availability of the above-described knowledge, including via DAD-IS and other AnGR information systems.

#### Strategic Priority Area 2. Sustainable use and development

- ensuring that monitoring strategies and early-warning systems for AnGR are sensitive to climate-change-related trends and risks;
- ensuring that AnGR management planning is integrated into the planning of climate-change adaptation and mitigation measures at the level of the production system and nationally;
- exploring options for increasing carbon sequestration in pastureland through better grazing management, the role of AnGR in such measures, and the potential that they may offer for integrated approaches to climate-change mitigation, livelihood objectives, conservation of wild biodiversity and sustainable use of AnGR;
- strengthening cooperation among the international forums and organizations involved in AnGR management, other aspects of biodiversity, climate change adaptation and mitigation, and other environmental issues;
- ensuring that livestock keepers and other relevant stakeholders are involved in planning climate-change adaptation and mitigation measures within livestock production systems and the role of AnGR within these measures;
- building on, or integrating, local knowledge of how to cope with harsh and fluctuating production environments within climate-change adaptation strategies (as relevant and appropriate to future conditions and objectives);
- ensuring that plans to introduce breeds to new geographical areas take account of climatic and other agro-ecological conditions and their predicted future trends;
- reviewing and, if necessary, adapting breeding goals to account for the effects of climate change;
- improving access to inputs and livestock services relevant to climate-change adaptation;
- exploring the potential for the introduction of payments for environmental services as a means of promoting ecological and socio-economic sustainability in grazing systems and hence the maintenance of the associated AnGR.

#### Strategic Priority Area 3. Conservation

- ensuring that conservation strategies account for the observed and projected effects of climate change, including agro-ecological changes and disaster risk, and if relevant the effects of climate change mitigation policies;
- reviewing in situ conservation schemes to account for climate change-driven changes in the home production systems of the respective breeds;
- ensuring that ex situ collections are sufficiently comprehensive, well managed and well located to provide insurance against climatic and other disasters.

#### Strategic Priority Area 4. Policies, institutions and capacity-building

- promoting awareness among policy-makers of the potential roles of AnGR in climate change adaptation and mitigation;
- ensuring that national strategies and action plans for AnGR account for the effects of climate change and can be reviewed and amended as necessary to account for future climate-related developments;
- promoting exchange of information on climate-change adaptation strategies for livestock systems and AnGR management, relevant breed adaptations and breed performance in specified production environments; and

- facilitating transparent, fair and equitable access to AnGR needed for climate change adaptation along with relevant associated knowledge and technologies.

### **Forest genetic resources**

31. FAO's work on forest ecosystems and forestry practices is based on the assumption that, when sustainably managed, forests can have a central role in climate change mitigation and adaptation. While the role of forests in mitigation and as a carbon sink is widely recognized, the significance of genetic diversity within species is less well appreciated. Trees can only provide mitigation services if they are well adapted to their surroundings and have the potential to adapt to future changes. In promoting good management practices for climate change mitigation and adaptation, FAO engages in activities that strengthen the adaptive capacity of trees and forests, especially in fragile forest ecosystems, as well as the adaptive capacity of forest-dependent communities.<sup>19</sup> Lessons learned on community forest management are key element of FAO's work on forest adaptation. FAO is an information hub for the sustainable management of planted forests and the promotion of reforestation, afforestation and forest restoration practices that contribute to combating climate change. FAO's voluntary guidelines for responsible management of planted forests set a normative framework for establishing and managing planted forests according to economic, environmental and social principles.

32. The Commission has acknowledged the urgency of conserving and sustainably utilizing forest genetic resources. With the support of FAO's Committee on Forestry, the Commission requested that a report on *The State of the World's Forest Genetic Resources* be prepared and presented to the Commission at its Fourteenth Regular Session.

33. FAO also promotes best practices in forest genetic resources management, specifically in the fields of conservation, exploration, testing, breeding and informed use of new biotechnology. To meet information needs at national level, FAO supports the collection of information related to biodiversity through the National Forest Monitoring and Assessment (NFMA) programme. At international level, FAO works closely with other forest-related international and regional organizations to harmonize information and requirements for reporting on forests. FAO provided forest-related information for *Global Biodiversity Outlook 3*<sup>20</sup> and incorporated the indicators for the 2010 Biodiversity Target and other forest-related biodiversity indicators into the Global Forest Resources Assessment 2010. The preparation of *The State of the World's Forest Genetic Resources* and the expansion of the NFMA approach should contribute to the development of additional indicators for monitoring forest biological diversity and the effectiveness of conservation measures.

### **Ecosystems, landscapes and river basins**

34. The triple challenge of simultaneously mitigating the effects of climate change, safeguarding natural resources more efficiently and producing more food and ensuring food security for future generations requires more effective policies and approaches that consider the complex interactions that exist among different actors and sectors within a given territory or landscape. An integrated approach is needed in order to ensure that natural resources, across sector boundaries, are used sustainably within landscapes and that production systems can capitalize on natural biological processes. Recently, increasing demand has emerged from international and global processes and from FAO member countries and partners for more coherent and integrated landscape-management/territorial-development approaches at all levels, including land-use planning and the use

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<sup>19</sup> FAO. 2010. *Managing forests for climate change: FAO, working with countries to tackle climate change through sustainable forest management*. Rome (available at <http://www.fao.org/docrep/013/i1960e/i1960e00.pdf>).

<sup>20</sup> <http://www.cbd.int/gbo3/>

of geospatial tools, in order better to address competition for resources and find synergies between sectors.

35. In response to these demands, FAO has started a process of awareness raising and sharing experiences and lessons learned from landscape/territorial programmes and projects conducted by FAO and partners. The objectives of this initiative are:

- to identify opportunities for improving synergies in landscape/territorial and integrated ecosystem planning, management and development;
- to reduce duplication of efforts and create greater impact in terms of contributing to the three pillars of sustainable development; and
- to develop a collaborative process for strengthening support to countries and partners with regard to work in this field.

36. Various holistic approaches and technologies for sustainably managing farmland, rangelands, forests and water supply have emerged and have been piloted and disseminated by FAO. These approaches include sustainable crop production intensification, organic agriculture, conservation agriculture, integrated crop–livestock management, agroforestry, sustainable fisheries management, sustainable forest management, silvo-pastoral systems and integrated watershed and river basin management. Future work on innovative methods for integrated landscape/territorial solutions supported by cross-sectoral knowledge, will contribute significantly to the safeguarding of genetic resources under worsening conditions.

#### *International waters projects*

37. FAO implements two Global Environment Facility (GEF) international waters projects addressing large marine ecosystems: the Bay of Bengal Large Marine Ecosystem Project<sup>21</sup> and the Protection of the Canary Current Large Marine Ecosystem Project.<sup>22</sup> A recent publication<sup>23</sup> outlines the effects of climate warming on the goods and services provided by large marine ecosystems in Africa, Asia and Latin America. The publication shows that the effects of climate change are resulting in shifts in distribution of fish populations. For the Canary Current, changes in maximum levels of sardine biomass were assessed and it was found that shifts in the movement of the stocks are in synchrony with wind direction and velocity and with plankton production. For the Bay of Bengal, the publication describes the impact of climate warming in terms of producing higher-intensity monsoons and lowering salinity levels in the waters of the Bay of Bengal Large Marine Ecosystem. The resulting increase in thermal stratification could lead to a long-term negative effect caused by a decline in primary production and a subsequent decline in fishery yields.

#### *Transboundary Agro-ecosystem Management Programme for the Kagera River Basin Project*

38. FAO is also the implementing agency for the GEF-funded Transboundary Agro-ecosystem Management Programme for the Kagera River Basin Project.<sup>24</sup> The Kagera river basin covers an area of 59 700 km<sup>2</sup> in Burundi, Rwanda, Uganda and the United Republic of Tanzania. The agro-ecosystems and biodiversity of the area are increasingly threatened by the overexploitation of resources and the resulting degradation, which are influenced by the transboundary nature of the basin. Existing local knowledge does not provide a means of coping with such insidious and unprecedented environmental changes. The project uses an integrated ecosystems approach that will

<sup>21</sup> <http://www.boblme.org>

<sup>22</sup> <http://www.canarycurrent.org/>

<sup>23</sup> UNDP. 2012. *Frontline observations on climate change and sustainability of large marine ecosystems*. New York (available at <http://iwlearn.net/publications/ll/frontline-observations-on-climate-change-and-sustainability-of-large-marine-ecosystems/view>).

<sup>24</sup> <http://www.fao.org/nr/kagera/en/>

generate local, national and global benefits including restoration of degraded lands, carbon sequestration, climate change adaptation and mitigation, protection of international waters, conservation and sustainable use of agrobiodiversity, and improved agricultural production leading to increased food security and improved rural livelihoods.

39. The project uses inter-sectoral approaches that will allow the land use–livelihood system to be addressed as a whole, considering both the environmental and the socio-economic benefits that can be obtained from more integrated land-use systems and better resource-management practices (i.e. improved efficiency and ecological functions of sustainable, diversified systems generating improved productivity and income with reduced inputs and costs) while contributing to the conservation of resources, restoration of degraded lands and maintenance of ecosystem services. Improved practices include, for example, agroforestry, crop–livestock integration, inter- and relay-cropping, species/varietal improvements, conservation agriculture, pasture improvement, sustainable harvesting and improved marketing of products from endemic plant and animal species (including medicinal and wild-food products).

### III. INTERNATIONAL PROCESSES

#### United Nations Framework Convention on Climate Change

##### *Adaptation Committee*

40. In 2010, as part of the Cancun Adaptation Framework, Parties to the UNFCCC established the Adaptation Committee to promote coherent implementation of action on adaptation under the Convention. At the Durban Climate Change Conference in 2011, Parties agreed on the composition of, and modalities and procedures for, the Adaptation Committee. The Doha Climate Change Conference at the end of 2012 approved the draft three-year workplan of the Adaptation Committee.<sup>25</sup>

41. The objectives of the Adaptation Committee are to raise the profile of adaptation at all levels, to promote the mainstreaming of adaptation into development and to strengthen national capacity to address adaptation. The Adaptation Committee will play a leading role in adaptation, including by incentivizing adaptation actions and promoting coherence in adaptation actions both within and outside the Convention. Its mission is to serve as an advisory body that raises awareness of, and ambition for, adaptation and promotes communication about adaptation, with the ultimate objective of facilitating the implementation of concrete adaptation actions and empowering communities.<sup>26</sup>

42. The workplan of the Adaptation Committee provides opportunities for contributions from organizations, as well as for collaboration. The Committee, for instance, will convene workshops with relevant bilateral, regional and multilateral institutions to further promote the implementation of adaptation actions. It will invite regional institutions and United Nations agencies supporting work on adaptation to communicate, as per a template developed by the Adaptation Committee, their current activities supporting adaptation in developing countries, including in relation to capacity-building. The Adaptation Committee's activities will also focus on facilitating the provision of technical assistance to developing countries in undertaking their vulnerability and adaptation assessments. It will convene a meeting to gather up-to-date information on adaptation, including the limits of adaptation, in collaboration with the Intergovernmental Panel on Climate Change Working Group II. It will also convene an expert meeting, led by members of the Adaptation Committee, on promoting livelihood and economic diversification to build resilience in the context of planning, prioritizing and implementing adaptation actions.<sup>27</sup>

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<sup>25</sup> Draft UNFCCC COP18 Decision “Work of the Adaptation Committee”.

<sup>26</sup> FCCC/SB/2012/3.

<sup>27</sup> FCCC/SB/2012/3.

### *Ad Hoc Working Group on Long-term Cooperative Action*

In March 2012, in response to the UNFCCC's invitation to Parties and admitted observer organizations to submit their views on issues related to agriculture<sup>28</sup> FAO provided a submission on support to the National Adaptation Plan process from a food-security perspective.<sup>29</sup> The submission highlighted the fact that the Commission, at its Thirteenth Regular Session *recognized the lack of awareness on the potential of genetic resources in contributing to both climate change adaptation and food security objectives* and that it *encouraged its Members to consider available information about the importance of including the management of genetic resources for food and agriculture in planning and implementing their country's National Adaptation Programmes of Action (NAPAs) and Nationally Appropriate Mitigation Actions (NAMAs)*. The eighteenth Conference of the Parties (COP) to the UNFCCC invited Parties and relevant organizations to share best practices and lessons learned in addressing adaptation through the ongoing work of the Least Developed Countries Expert Group (LEG), the Nairobi Work Programme on Impacts, Vulnerability and Adaptation to Climate Change (NWP) and other bodies and ongoing work under the Convention.<sup>30</sup>

### *Subsidiary Body for Scientific and Technological Advice*

43. At the UN Climate Change Conference in Bonn, in May 2012, participants debated the scope of possible work on agriculture. A number of Parties stated that this work should focus exclusively on building the adaptation capacity of agricultural sectors, while others expressed the view that this work should have a broader scope and should address both adaptation and mitigation. Parties agreed to continue their discussion of agriculture at the thirty-seventh session of the Subsidiary Body for Scientific and Technological Advice (SBSTA) of the UNFCCC (Doha, November 2012). At the SBSTA meeting, after several interventions by Parties, the Chair ruled that there was no consensus among Parties that the matter should be referred to the COP for further consideration. The meeting agreed that the SBSTA would continue its consideration of this agenda item at its thirty-eighth session.<sup>31</sup>

44. The NWP is implemented under the SBSTA of the UNFCCC by Parties, intergovernmental and non-governmental organizations, the private sector, communities and other stakeholders. The NWP assists Parties, in particular developing countries, to:

- improve their understanding and assessment of the impacts of, and vulnerability and adaptation to, climate change; and
- make informed decisions on practical adaptation actions and measures to respond to climate change on a sound scientific, technical and socio-economic basis, taking into account current and future climate change and variability.<sup>32</sup>

45. The NWP disseminates knowledge and information on adaptation, and highlights the work of partners as widely as possible through a variety of knowledge products and publications. Organizations, institutions and private-sector companies at all levels and in a wide range of sectors can engage with the programme by becoming a partner and making an Action Pledge.

### *Least Developed Countries Expert Group*

<sup>28</sup> FCCC/AWGLCA/2011/L.4, paragraph 69.

<sup>29</sup> FAO. 2012. *Submission by the Food and Agriculture Organization of the United Nations on the support to the National Adaptation Plan Process from a food security perspective*. Rome (available at <http://unfccc.int/resource/docs/2012/smsn/igo/84.pdf>).

<sup>30</sup> Draft UNFCCC COP18 Decision "National Adaptation Plans".

<sup>31</sup> FCCC/SBSTA/2012/5, paragraph 67.

<sup>32</sup> [http://unfccc.int/adaptation/nairobi\\_work\\_programme/items/3633.php](http://unfccc.int/adaptation/nairobi_work_programme/items/3633.php)

46. The UNFCCC LEG in collaboration with the GEF and its agencies, including FAO, initiated a series of regional training workshops on the implementation of NAPAs. The workshops aim to provide technical support for the design of implementation strategies for the NAPAs, and to build capacity in the preparation and submission of project documents to the GEF under the Least Developed Countries Fund, and, where needed, to provide technical support to Least Developed Country Parties that are still preparing their NAPAs.<sup>33</sup>

47. The LEG was subsequently requested to prepare technical guidelines for the National Adaptation Plan (NAP) process, building on the elements and recommended activities contained in the initial guidelines provided by the COP. The NAP process will be continuous, with multiple entry points depending on national circumstances. Some steps will be iterative over sectors, space and time, and activities will be implemented, reviewed and repeated as necessary. In accordance with the guidelines, the implementation of the NAPs will require support in terms of knowledge and tools. At COP 19, Parties to the UNFCCC will take stock of and, if relevant, revise the NAP guidelines.<sup>34</sup>

### **United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries**

48. The United Nations Collaborative Programme on Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (UN-REDD),<sup>35</sup> launched in 2008, aims to create a financial value for the carbon stored in forests, offering incentives for developing countries to reduce emissions from forested lands and invest in low-carbon pathways to sustainable development. “REDD+” goes beyond deforestation and forest degradation, and includes the roles of conservation, sustainable management of forests and enhancement of forest carbon stocks. UN-REDD supports national REDD+ readiness efforts in 46 partner countries (many of them ACP countries) in two ways: (i) direct support to the design and implementation of UN-REDD National Programmes; and (ii) complementary support to national REDD+ action through common approaches, analyses, methodologies, tools, data and best practices developed through the UN-REDD Global Programme.

49. Within UN-REDD, FAO has primary responsibility for supporting countries and developing their capacity for forest monitoring and reporting. FAO also works with UNDP and partner countries to improve forest governance and various “safeguards” that have been agreed upon in the UNFCCC.

### **High Level Panel of Experts of the Committee on World Food Security**

50. The High Level Panel of Experts on Food Security and Nutrition (HLPE) of the Committee on World Food Security (CFS) prepared the report *Climate change and food security*.<sup>36</sup> The CFS requested that the report “*review existing assessments and initiatives on the effects of climate change on food security and nutrition, with a focus on the most affected and vulnerable regions and populations and the interface between climate change and agricultural productivity, including the challenges and opportunities of adaptation and mitigation policies and actions for food security and nutrition.*” Following a request from the Commission,<sup>37</sup> its Secretary transmitted the studies on climate change and genetic resources for food and agriculture<sup>38</sup> presented at the Commission’s Thirteenth Regular Session to the HLPE.

<sup>33</sup> UNFCCC decision 8/CP.13.

<sup>34</sup> UNFCCC decision 5/CP.17.

<sup>35</sup> <http://www.un-redd.org/AboutUN-REDDProgramme/tabid/102613/Default.aspx>

<sup>36</sup> HLPE. 2012. *HLPE Report 3: Food security and climate change. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security*. Rome (available at [http://www.fao.org/fileadmin/user\\_upload/hlpe/hlpe\\_documents/HLPE\\_Reports/HLPE-Report-3-Food\\_security\\_and\\_climate\\_change-June\\_2012.pdf](http://www.fao.org/fileadmin/user_upload/hlpe/hlpe_documents/HLPE_Reports/HLPE-Report-3-Food_security_and_climate_change-June_2012.pdf)).

<sup>37</sup> CGRFA-13/11/Report, paragraph 50.

<sup>38</sup> Background Study Papers 53 to 57 and 60 (available at <http://www.fao.org/nr/cgrfa/cgrfa-back/en/>).



51. The HLPE report presents six recommendations to the CFS. Recommendation 2, *Increase resilience of food systems to climate change*, contains specific reference to genetic resources and specifically addresses the Commission. Recommendation 2 c), *Facilitate greater diversity in the field and give broader access to genetic resources*, highlights the need to *minimize genetic erosion of the remaining biodiversity both in situ and in gene banks*. The recommendation further emphasizes the need to utilize the proper genetic resources for food and agriculture *both of existing crops, livestock and their wild relatives, as well as varieties that may be used in the future* in order to ensure efficient adaptation to climate change, also emphasizing the point that *crop genes for drought and flood tolerance should be identified and shared* and that *yield stability traits of species under variable conditions are particularly important domains where more understanding and research is needed*. The need for cooperation among stakeholders, at both governmental and non-governmental levels, is also mentioned as a means of *ensuring dissemination, distribution and creation of knowledge and transfer of technologies to characterize, conserve and curate genetic resources both in situ and in seed banks, germplasm stores and related facilities to support adaptation to climate change*. Moreover, it is suggested that the *Commission on Genetic Resources for Food and Agriculture could consider identifying priority measures and developing a plan of action on the conservation and use of genetic resources for adaptation to climate change*.

### **Committee on World Food Security**

52. The agenda of the Thirty-ninth Session of the Committee on World Food Security (October 2012, Rome) included a Policy Roundtable on Food Security and Climate Change, during which the report from the HLPE was discussed.

53. The Committee “*taking into account the urgent need for actions to address the effects of climate change on food security as well as the root causes of food insecurity in a manner coherent with the progressive realization of the right to food in the context of national food security, [...] invited Member States (MS), International Organizations (IO) and other CFS stakeholders, as appropriate, and recognizing the role of the UNFCCC: [...] to create conditions to facilitate access to genetic resources for food and agriculture and the fair and equitable sharing of the benefits arising from their use for example by: [...] inviting the FAO Commission on Genetic Resources for Food and Agriculture to continue and strengthen its work on climate change and genetic resources including conservation and use of genetic resources for adaptation to climate change (MS)*.”<sup>39</sup> The decisions of the CFS and the HLPE report have been transmitted to the UNFCCC.

### **High Level Committee on Programme’s Working Group on Climate Change**

54. The UN System has embarked on an action-oriented and coordinated effort to support the international community in addressing the challenge of climate change. The main mechanism for UN System-wide coordination in this programme area is the High Level Committee on Programmes (HLCP), which is responsible to the Chief Executives Board (CEB) for Coordination. The HLCP established a Working Group on Climate Change to facilitate the sharing of information and knowledge and to enhance the coherence and coordination of action on climate change by UN System organizations. The work of the Working Group is based on the ten focus and cross-cutting areas of the CEB Climate Action Framework. Under the Climate Change Action Framework, five focus areas (adaptation, technology transfer, forestry and agriculture, financing mitigation and adaptation action, capacity building) and four cross-cutting areas (climate knowledge: science, assessment, monitoring and early warning; supporting global, regional and national action; public awareness-raising; social dimensions of climate change) have been identified in response to the UNFCCC negotiation process and in pursuance of the broader mandates and capacities in the UN System. Each area is co-convened

<sup>39</sup> CFS 2012/39 FINAL REPORT, paragraph 11.

by two or more UN System organizations. FAO convenes the focus area on forestry and agriculture, together with UNDP and UNEP.

55. In October 2012, the HLCP agreed to extend the mandate of the Working Group until the spring of 2014. The most critical activities of the Working Group are considered to be information and knowledge sharing, joint implementation of climate action, informing CEB members on climate change issues, coordinating the UN position and presence at UNFCCC COP and other relevant fora, and preparing joint outreach and communication tools. Under the auspices of the Working Group, several successful joint programming initiatives (e.g. Global Framework for Climate Services; UN-REDD; UN CC: Learn; CSA; and Access to Finance) have also been created and are now being implemented.<sup>40</sup>

56. The Working Group has identified two major tracks of strategic engagement for its ongoing work: 1) promoting joint programming of interagency climate projects and initiatives; and 2) supporting climate change negotiations. Both tracks are supported by two cross-cutting activities: strengthening communications; and enhancing climate action on the ground. In the past, the Working Group has convened joint UN System side events as a means of supporting climate change negotiations. The Working Group has recently decided that UN System support to climate change negotiations needs to be strengthened and become a more continuous and systematic process. Activities are foreseen to include providing direct input and technical briefings to Parties on major challenges or on progress being made by thematic groups, and linkage with UNFCCC bodies.

57. The Working Group agreed that a number of time- and task-bound teams should be created within the Working Group to address implementation challenges on the ground. Possible work streams could include translating science into useful information relevant to various communities; use of information and communication technologies to transmit climate-related information; assisting communities to take action (legislation, preparedness, early warning); urban risk management and climate-smart cities; and implementing formal and informal education, social protection and ecosystems management.

### **Rio+20 follow-up process and post-15 development agenda**

58. The Rio+20 Summit recognized that climate change is threatening food security and efforts to eradicate poverty and achieve sustainable development and that *adaptation to climate change represents an immediate and urgent global priority*.<sup>41</sup>

59. Climate change is identified as a major threat to efforts to promote, enhance and support more sustainable agriculture – including crop and livestock production, and forestry, fisheries and aquaculture – that improves food security, eradicates hunger and is economically viable, while conserving land, water, plant and animal genetic resources, biodiversity and ecosystems, and enhancing resilience to climate change and natural disasters.<sup>42</sup> It is also recognized as having major implications for the conservation and sustainable use of the oceans and seas and of their resources for sustainable development, including through their contributions to poverty eradication, sustained economic growth, food security and the creation of sustainable livelihoods and decent work.<sup>43</sup>

60. In Rio, states decided to launch a process to develop a set of Sustainable Development Goals (SDGs), would build upon the Millennium Development Goals (MDGs) and converge with the post-2015 development agenda. Governments also decided to establish an intergovernmental process under the General Assembly to prepare options for a strategy for sustainable development financing. As a follow-up, the UN Secretary General established a working group on the post-2015 development agenda.

<sup>40</sup> HLCP Working Group on Climate Change Workshop: *Aligning our strengths to advance and sustain climate action*. Note by the Chair CEB/2012/HLCP-XXIV/CRP.4.

<sup>41</sup> See the Resolution adopted by the General Assembly: “The future we want” A/RES/66/288, paragraph 190.

<sup>42</sup> A/RES/66/288 paragraph 111.

<sup>43</sup> A/RES/66/288, paragraph 158.

61. FAO is committed to contribute to the international development agenda, such as Agenda 21, World Summit on Sustainable Development and the MDGs, especially in relation to land, water, agriculture, fisheries, forestry, biodiversity, food security and rural development. FAO reports on progress to the UN Commission on Sustainable Development, the Inter-Agency Expert Group on the MDGs and several other global mechanisms. FAO has recently established a Corporate Task Team on the Post-2015 Development Agenda and Follow-up to Rio+20, which will facilitate, coordinate and guide FAO's engagement in the post-2015 agenda, follow-up to Rio+20 and other relevant processes in a systematic, pro-active and coherent way.

### **Global Conference on Agriculture, Food Security and Climate Change**

62. The Global Conference on Agriculture, Food Security and Climate Change,<sup>44</sup> held in 2010 in The Hague (the Netherlands), was the first global conference of its kind to bring together the agendas of agriculture, food security and climate change. The conference emphasized the need to increase productivity, adaptation and mitigation in agriculture simultaneously through CSA. It concluded with a commitment to specific actions, outlined in a Roadmap for Action,<sup>45</sup> which identifies genetic resources among the tools and technologies for CSA.

63. FAO is an active partner in the process and the FAO Climate Smart Initiative is recognized as an important instrument for coping with climate change. The Roadmap was updated at a second conference, held in September 2012, in Hanoi. A third conference is envisaged for 2013 in South Africa, with the fourth to be held in Tonga.

### **International research and policy**

64. In general terms, research highlights the need for a transition to a global food system that satisfies human needs, reduces its carbon footprint, adapts to climate change and is in balance with planetary resources. Research also indicates that such a transition requires concrete and coordinated actions, implemented simultaneously, on a large scale and with urgency. It is recognized that both local and global actions that accelerate the sharing of lessons on institutions, practices and technologies for adaptation and mitigation are needed, as is serious commitment to working in partnership, enhancing capacity and addressing societal differences.

65. In 2011, the CGIAR Consortium of International Agricultural Research Centres developed a research programme on Climate Change, Agriculture and Food Security,<sup>46</sup> which seeks to overcome the threats to agriculture and food security in a changing climate by exploring new ways of helping vulnerable rural communities adjust to global changes in climate. The overarching objectives of the research programme are to:

- identify and test pro-poor adaptation and mitigation practices, technologies and policies for food systems, adaptive capacity and rural livelihoods; and
- provide diagnosis and analysis that will ensure cost-effective investments, the inclusion of agriculture in climate change policies and the inclusion of climate issues in agricultural policies, at all levels from the subnational to the global, in a way that brings benefits to the rural poor.

66. Among the programme's outputs is an interesting study that identifies areas that are food insecure and vulnerable to the impacts of future climate change, across the priority regions for the

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<sup>44</sup> <http://www.afcconference.com/>

<sup>45</sup> <http://www.afcconference.com/the-first-conference/135-final-roadmap-for-action>

<sup>46</sup> <http://www.cgiar.org/our-research/cgiar-research-programs/cgiar-research-program-on-climate-change-agriculture-and-food-security-ccafs/>

CGIAR, based on maps of variables that indicate the various aspects of food security (availability, access and utilization) and thresholds of climate change exposure important for agricultural systems.<sup>47</sup>

67. The Commission on Sustainable Agriculture and Climate Change, a strategic collaboration between the CGIAR and the Earth System Science Partnership, published a study that reviewed the scientific evidence for the effects of climate change on agricultural production to identify a pathway for achieving food security in the context of climate change.<sup>48</sup>

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<sup>47</sup> Ericksen, P., Thornton, P., Notenbaert, A., Cramer, L., Jones, P. & Herrero, M. 2011. *Mapping hotspots of climate change and food insecurity in the global tropics*. CCAFS Report No. 5. CGIAR Research Program on Climate Change, Agriculture and Food Security, Copenhagen (available at <http://cgspace.cgiar.org/handle/10568/3826>).

<sup>48</sup> Beddington, J., Asaduzzaman, M., Fernandez, A., Clark, M., Guillou, M., Jahn, M., Erda, L., Mamo, T., Van Bo, N., Nobre, C.A., Scholes, R., Sharma, R. & Wakhungu, J. 2011. *Achieving food security in the face of climate change: Summary for policy makers from the Commission on Sustainable Agriculture and Climate Change*. CGIAR Research Program on Climate Change, Agriculture and Food Security, Copenhagen (available at [http://cgspace.cgiar.org/bitstream/handle/10568/10701/Climate\\_food\\_commission-SPM-Nov2011.pdf?sequence=6](http://cgspace.cgiar.org/bitstream/handle/10568/10701/Climate_food_commission-SPM-Nov2011.pdf?sequence=6)).