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THIRTIETH FAO REGIONAL CONFERENCE FOR THE NEAR EAST

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**Climate Change Adaptation and Mitigation: New Initiatives and Update on
Agriculture, Forestry and Fisheries**

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I. INTRODUCTION

1. Climate change has emerged as one of the greatest global challenges of this century. The Near East Region, where scarce natural resources are already under considerable pressure, is one of the areas of the world most vulnerable to any escalation of the frequency and intensity of extreme climatic events.

2. Deteriorating climatic conditions are projected for the Region in coming decades. Studies indicate that towards the end of the century, temperatures could rise by from 4° to 7°C in much of the Arabian Peninsula and some southern areas of the Islamic Republic of Iran, and from 3° to 6°C in the Mediterranean region¹. At the same time, climate scenarios for the future indicate that precipitation is very likely to decrease in the Region². Climate change would also raise sea levels and threaten the coastal areas of the Region with an increased risk of flooding and coastal erosion and, as a consequence, would degrade natural ecosystems. The various threats posed by climate change can be expected to undermine regional food security significantly and to cause the deterioration of the livelihoods of a large segment of the population.

II. CLIMATE CHANGE THREATS TO FOOD PRODUCTION BASES IN THE NEAR EAST

3. Water resources also can be expected to be highly vulnerable to projected climate change impacts in the Region that is already troubled by severe water scarcity³. As a result of increase of temperature and decrease of precipitation, a reduction of runoff by over 40 percent is thought likely toward the end of the century in Mediterranean coastal areas⁴ and severe drought, already a major concern in the Region, could increase in frequency, leading to further land degradation and desertification. Climate change is also likely to impact on surface water flows, including major shared water resources such as the Nile River and the Tigris and Euphrates rivers. Due to a reduced recharge into aquifers, as well as seawater intrusion along coastal areas, climate change could also threaten groundwater resources⁵. The risk to water resources could be further exacerbated by an overall increase in water use.

4. Agricultural production in the Region also is likely to suffer from climate change, primarily from changing pattern in temperature and precipitation. A recent study in Morocco examined the impact of projected climate change on 50 crops in six agro-ecological zones under two different scenarios⁶. The study's projections indicate that in a favorable ecological zone, the yield loss of rainfed wheat and barley would be more than 15 percent by 2050; in the case of sugar beet in a favorable zone and in that of barley in an intermediate ecological zone, the yield decrease could reach levels above 30 percent by 2050. In addition to temperature and precipitation changes, extreme climate events and sea level rise (SLR) are likely to further increase the risks to the region's agriculture.

¹ IPCC. 2007a. *Climate change 2007: The physical science basis*. Contribution of working group I to the fourth assessment report of IPCC.

² FAO. 2009a. *Climate change in the Near East and North Africa region*. Technical paper prepared by Kanamaru, H. for FAO/WorldFish workshop. Cairo, Egypt.

³ Regional annual average of internal renewable water resources per capita is around one-tenth of the world average even with high variability in available water resources among the countries within the region.

⁴ IPCC. 2007b. *Climate change 2007: Synthesis report, contribution of working groups I, II and III to the fourth assessment report of the IPCC* (as cited by FAO, 2009a).

⁵ UN. 2009. *Adaptation to climate change in the Arab region*. Internal document for the LAS-UN 9th sectoral meeting edited by Haddad, A. (UNEP) based on inputs from UN agencies. Cairo, Egypt.

⁶ Gommès, R., et al. 2009. *Morocco study on the impact of climate change on the agricultural sector: Impact of climate change on agricultural yields in Morocco*. FAO, Government of Morocco, and World Bank.

5. Climate change is also likely to modify the distribution of marine and freshwater fish species. Sea level rise, ocean acidification and changes in water resources would adversely affect ecosystems, including coral reefs, wetlands, rivers, lakes and estuaries. The increased risk of species invasions and of the spread of vector-borne diseases raises additional concerns⁷. A recent FAO regional workshop on the ecosystem approach to responsible fisheries identified likely climate change impacts on fisheries and aquaculture in the Near East. The most probable impacts on the biophysical well-being of capture fisheries include fish-recruitment/life cycle and changes in habitat structure. As for aquaculture, the principal impacts include water quality, red tide and climatic events⁸.

6. Potential climate change impacts such as water stress, more frequent and extreme weather events, and coastal erosion would also intensify the existing pressure on the region's forests and rangelands, leading to further land degradation and deforestation⁹. If the likelihood of severe human reactions were to be factored in, such ecosystems would risk coming under extreme pressure that, given the fragile environmental situation in the Region, may be hard to resist. Climate change is also likely to force the shift of species habitats, to increase the risk of wildfire and to raise the risk of species extinction. It would also adversely affect forest health, in the same way as the recent outbreaks of forest pests in Lebanon, Morocco and Saudi Arabia.

7. Climate change would also have a major impact on livestock, with the increased occurrence of droughts likely to have a deadly effect on the health of herds and on the conservation of natural resources. In addition, the risk of heat stress and floods no doubt would raise the probability of trans-boundary animal diseases such as Rift Valley Fever and Blue Tongue. Such impacts would be accompanied by a growing demand for animal products in the Region, a trend which shows that the share of livestock production in total agricultural production would continue to steadily rise to around 45 percent by 2050¹⁰.

III. FAO ACTIVITIES AND INITIATIVES TO HELP ADDRESS CLIMATE CHANGE THREATS IN THE REGION

8. FAO began discussing the issue of climate change as far back as the 1980s. In December 1993, it organized an Experts Consultation on "Global Climate Change and Agricultural Production: the direct effects of changing hydrological and plant physiological processes". However, it is only in the past five years or so that the subject has become a focus of world attention. Increasingly, FAO has been looking more closely at how climate change is affecting agriculture and food security and what can be done to help alleviate its negative impacts.

9. Even FAO's recent internal restructuring took this new threat to food security and other related emerging challenges into consideration; the Environment, Climate Change and Bioenergy Division (NRC) was created as was a new department as of 1 January 2007, the Natural Resources Management and Environment Department to lead the Organization's work on climate change and environmental issues. An Inter-Departmental Working Group on Climate Change has also been established with the involvement of all units that play a role in addressing the issue. Multi-disciplinary Working Groups on climate change have also been established in the Organization's decentralized offices to respond to the needs of member countries in a more coherent and integrated manner.

10. FAO's Regional Office for the Near East has dedicated considerable attention to climate change issues and has, in this context, conducted a wide range of initiatives and activities in the

⁷ FAO RNE. 2009. *Concept note for a regional multi-disciplinary project on climate change for the Near East region*. Internal working document based on a draft prepared by Balgis, E. Cairo, Egypt.

⁸ FAO RNE. 2010. *Draft workshop proceeding: Adapting to climate change: the ecosystem approach to fisheries and aquaculture in the Near East and North Africa region*. Internal working draft dated 15 April 2010. Cairo, Egypt.

⁹ FAO. 2010. *Assessing the risk and vulnerability to climate change for the forestry and range sectors in the Near East*. Session document of the 19th FAO Near East Forestry Commission. Hammamet, Tunisia.

¹⁰ FAO. 2008. *Near East agriculture towards 2050: Prospects and challenges*.

Region. In response to the conclusions of the Twenty-ninth Regional Conference for the Near East that was held in March 2008, FAO has set climate change as a priority area for coordinated actions and established a multi-disciplinary Working Group to carry forward an agenda addressing climate change in the Region.

11. This Working Group is made up of officers who are experts on agriculture and food security, forestry, fisheries, animal production and health, water resources and crop production and protection. Members of the Group are liaising with other FAO colleagues from across the Region, including sub-regional offices, country offices and project staff. In November 2009 the first Forum on Climate Change in the Near East and North Africa Regions was organized in Rome in collaboration with the World Bank, WFP, IFAD and with the participation of UNDP. Also present at that forum, which focused on financial mechanisms and regional cooperation, were representatives of climate change financial mechanisms, Near East member countries and regional research and development organizations. A Second Forum will be held in the Region during the first quarter of 2011.

12. The first Forum on climate change in the Region laid the groundwork for an agenda for financing climate change responses in the agricultural sector through the identification of key activities, potential financing mechanisms and regional cooperation. The forum identified sub-sectors requiring urgent intervention (land and water management, cropping systems, range and forest management) and developed a draft road map for collaboration. In June 2009, FAO was an active participant in the "UN-LAS" Ninth Sectoral Meeting (June 2009), which focused on climate change and concluded with an agreement that UN and LAS specialized organizations would collaborate on the preparation of a vulnerability assessment regarding the impact of climate change on water and land resources.

13. In November 2009, FAO organized a regional workshop in Egypt together with the World Fish Center that focused on the "Ecosystem Approach to Fisheries and Aquaculture". In addition to the priority given to biophysical issues, the workshop focused on secondary climate change impacts on capture fisheries and aquaculture in terms of human well-being and governance. It also identified adaptation strategies and analyzed their implementation capacity. Its recommendations included greater support for activities designed to identify deficitary implementation-capacity at national, watershed and regional levels, for action to counter the general lack of reliable data in capture fisheries and for activities to build up further capacity development and information sharing.

14. During the last session of the FAO Near East Forestry Commission in Tunisia in April 2010, FAO also organized a parallel event on Forests and Climate Change. At the event, a regional analysis on forests and climate change, on forest ecosystems management in Morocco and on the socio-economic aspects of climate change and forests was presented. During the discussion, it was emphasized that the information flow among national bodies and coordination among them had to be improved. Another important priority, the experts concluded, was awareness-raising among climate change negotiators with regard to the positive roles that forests can play in climate mitigation and adaptation.

15. At the country level, FAO and the World Bank conducted a study on the impact of climate change on Moroccan agriculture toward the end of this century. FAO and other UN organizations are also providing support for the implementation of a "Joint Programme on Climate Change Risk Management" in Egypt and Jordan. This joint programme provides assistance to countries around the world in reaching the Millennium Development Goals despite the threat of climate change. In addition, FAO is actively involved in the formulation and implementation of an Egyptian technical cooperation programme designed to set up a comprehensive monitoring system able to generate reliable forecasts of sea level rise impacts resulting from climate change on soil and groundwater in the Nile Delta. Other FAO activities and initiatives of concern to the Region are outlined in the 6th Session Report of the Agriculture and Land and Water Use Commission for the Near East (ALAWUC); these can be found in the section "Actions Taken by FAO."

16. At the international level, FAO continuously takes the lead role in calling for urgent action to address the risks of climate change for food security. In this respect, in June 2008, FAO convened, in collaboration with other international organizations, the High-Level Conference on World Food Security: the Challenges of Climate Change and Bio-energy. Subsequently, in September 2008, FAO

took a leading role, jointly with UNDP and UNEP, in launching the REDD Programme (Reducing Emissions from Deforestation and Forest Degradation). The Secretariat of the newly established REDD+ Partnership will be provided jointly by the UN and the World Bank. FAO, from its leadership in the UN REDD Programme, will play a prominent role in this partnership together with UNDP, UNEP and the Forest Carbon Partnership Facility (FCPF FMT).

IV. THE WAY FORWARD

17. The concept note on “Climate Change and Food Security in the Near East Region” developed by FAO in 2009 aims at strengthening the lead role of the Organization in identifying a framework for devising counteractions against climate change for sectors likely to be affected by food security questions. The note outlined eight priority areas, with a particular focus on adaptation measures integrated with mitigation responses.

18. Capacity development was identified as a key to addressing climate change concerns in the Region. Capacity-related gaps in the Region¹¹ include the assessment of climate change impacts and vulnerability, observation and monitoring, communication and networking¹², and the identification and implementation of pertinent adaptation and mitigation activities. In this context, strengthening national institutions and building human capacity are essential; additionally, it is important to develop collaboration among regional and national institutions for conducting research and training.

19. The importance of stakeholder opinions and experiences in the development of climate change impact and adaptation strategies at both local and national levels cannot be underestimated. It has become clear over time that the integration of stakeholders and actors’ perspectives in the decision-making processes will both enhance the stability and sustainability of policies and, at the same time, provide a clear connection between policy formulation, on the one hand, and the benefits gained at the ground level, on the other. FAO is at the forefront of developing methods to capture the position of critical stakeholders in both a qualitative and quantitative way in so far as the impact of climate change on food security and crucially the vulnerability of the populations associated with that condition.

20. Due to the high degree of uncertainty regarding the likely impacts of climate change (there is only a limited amount of reliable data available and projection models are inherently undependable), it is critical that scientific monitoring and assessment of carefully selected indicators be enhanced. Scientific assessment is the first step in providing adequate information to decision-makers regarding improved resource management. In addition, to maintain accuracy, assessments must be based on regular monitoring at different levels. The process of dealing with uncertainty also can be helped along by the development of scenarios that look at potential food security impacts and vulnerabilities to climate change and which, subsequently, can play an important role in underpinning medium-term strategic policy development. FAO’s decades of accumulated knowledge on natural resources, food security, climate data and policy development puts it in a strong position to facilitate the development among international partners of a coherent and effective response to the challenges posed to food security by the prospect of significant climate change.

21. Another challenge for climate change adaptation in the Region involves the ability of decision-makers to comprehend the macro- to micro-level effects of climate change and, subsequently, to ensure the integration of all relevant sectors into coherent national responses. Hence,

¹¹ A synthesis report for the 31st session of the Subsidiary Body for Scientific and Technological Advice consolidates views and information from Parties and relevant organizations. The report supports the capacity gaps identified in the region. It highlights the need for institutional capacity development to enhance data availability and technical skills for integrated assessments and to coordinate mechanisms at national levels; deficient capacity for the formulation, analysis and implementation of specific integrated plans.

¹² UNFCCC (2009) reports the incapability of different levels of government, institutions and others to coordinate effectively as a common barrier for integration. It also reports policy related barriers for integration such as the lack of legal frameworks and enabling environments as well as the lack of political commitment at the highest level for coordination and a cross-sectoral approach.

support to policy planning for adaptation strategies and the building of key institutional capacities is crucial if unified national frameworks and sound cross-sectoral coordination are to be established.

22. Public information and awareness-raising are essential to enhancing a sense of responsibility among policy-makers and their communities regarding climate change and environmental conservation and to fostering the adoption of innovative approaches. The need to raise public awareness was one of the priorities highlighted during the Ninth Sectoral Meeting between the LAS and the UN¹³.

23. It is also necessary that the Region as a whole find a way to enhance the capacity of policy-makers to easily access the financial resources available for climate change adaptation and mitigation strategies; sources such as WB FCPF, UNFCCC-designated funds and REDD+ Partnership must be tapped if an effective agenda for investment in climate change countermeasures is to be put forward and if regional decision-makers are to be able to respond more effectively and efficiently to the challenges of ensuring national food security.

24. Since dealing with climate stresses and anomalies may well be beyond the coping capacity of individual farmers and communities in the Region, it is essential to develop an integrated approach for adaptation and national hazard risk management at various governance levels. Such an approach must consolidate existing information, generate new knowledge to cover significant gaps, and analyze scenarios and adaptive capacity. These should include provision for early warning systems, which are crucial to address uncertainties associated with climate change. The process should include regional and national methodologies that include stakeholder perspectives for characterizing vulnerable populations. FAO has consistently demonstrated a strong comparative advantage in the integration of the critical elements in this field and is in a strong position to continue to offer leadership.

25. The application of mitigation responses to the agriculture and forestry sectors requires further attention by member countries in the Region. Mitigation is inextricably linked to adaptation. Agriculture, when combined with related land use changes, is a major source of greenhouse gases while mitigation practices that are related to agriculture and forestry could provide co-benefits that, in themselves, will further contribute to adaptation, food security and sustainable development¹⁴.

26. Over the last year, FAO continued to work closely with member countries, both individually and collectively, to close these gaps and to build greater resilience to climate change threats in the Region. The FAO work plan for the current biennium builds on the findings of previous activities and targets the aforementioned priorities. Preparations for the Second Regional Forum on Climate Change and Food Security are underway. The purpose of the Forum will be: to take stock of new developments in the countries of the Region; to improve the use of, and benefit from, financial mechanisms; to strengthen regional collaboration; and to provide support for the formulation and implementation of climate change projects.

27. Dealing successfully with climate change depends on the collective action taken by all those involved. FAO will continue to play a leading role by: providing information designed to raise awareness among national decision-makers on climate change impacts; building national capacity; assisting access to climate change funds; strengthening programmes for climate change adaptation and mitigation. The role of individual countries in devising and implementing national initiatives on climate change adaptation and mitigation is pivotal. Without their commitment at policy and action levels, global and regional efforts will remain pointless. The role of the international community in dealing with climate change in the Region, particularly with regard to funding mechanisms such as the Global Environmental Facility, the New Partnership on REDD+, the World Bank's Forest Carbon Partnership Facility and the Clean Development Mechanism, is essential.

¹³ LAS-UN. 2009. *Final meeting report draft2: The ninth sectoral meeting between LAS and UN and their specialized organizations on "Climate Change."* Internal meeting report. Cairo, Egypt.

¹⁴ FAO. *Anchoring agriculture within a Copenhagen Agreement: A policy brief for UNFCCC parties by FAO.*