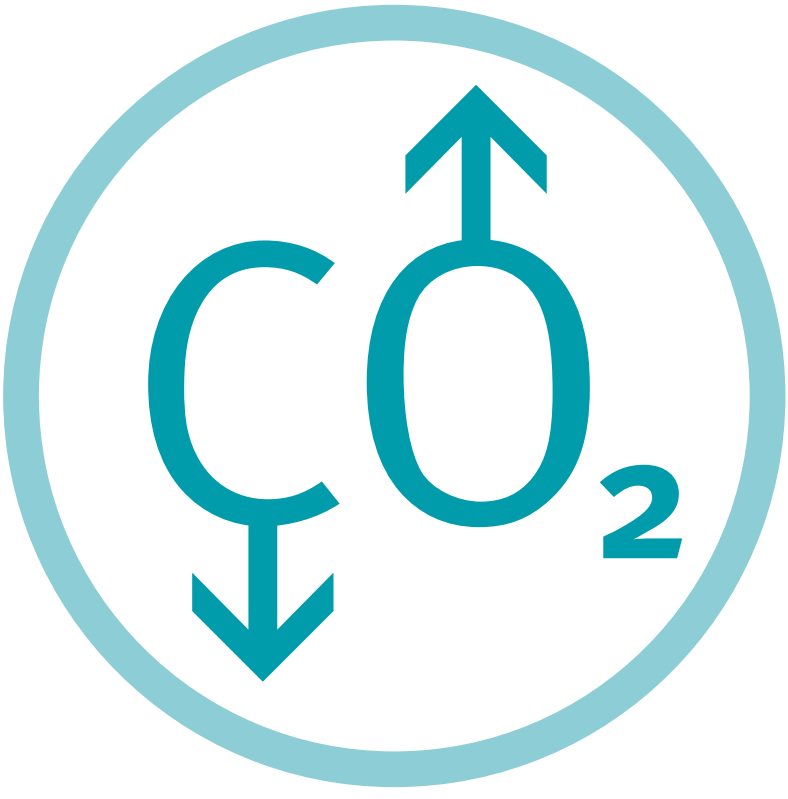

LINKING CLIMATE CHANGE FINANCING AND SUSTAINABILITY

IMPLICATIONS FOR AGRICULTURE

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Food and Agriculture Organization of the United Nations (FAO)

Natural Resources Management and Environment Department

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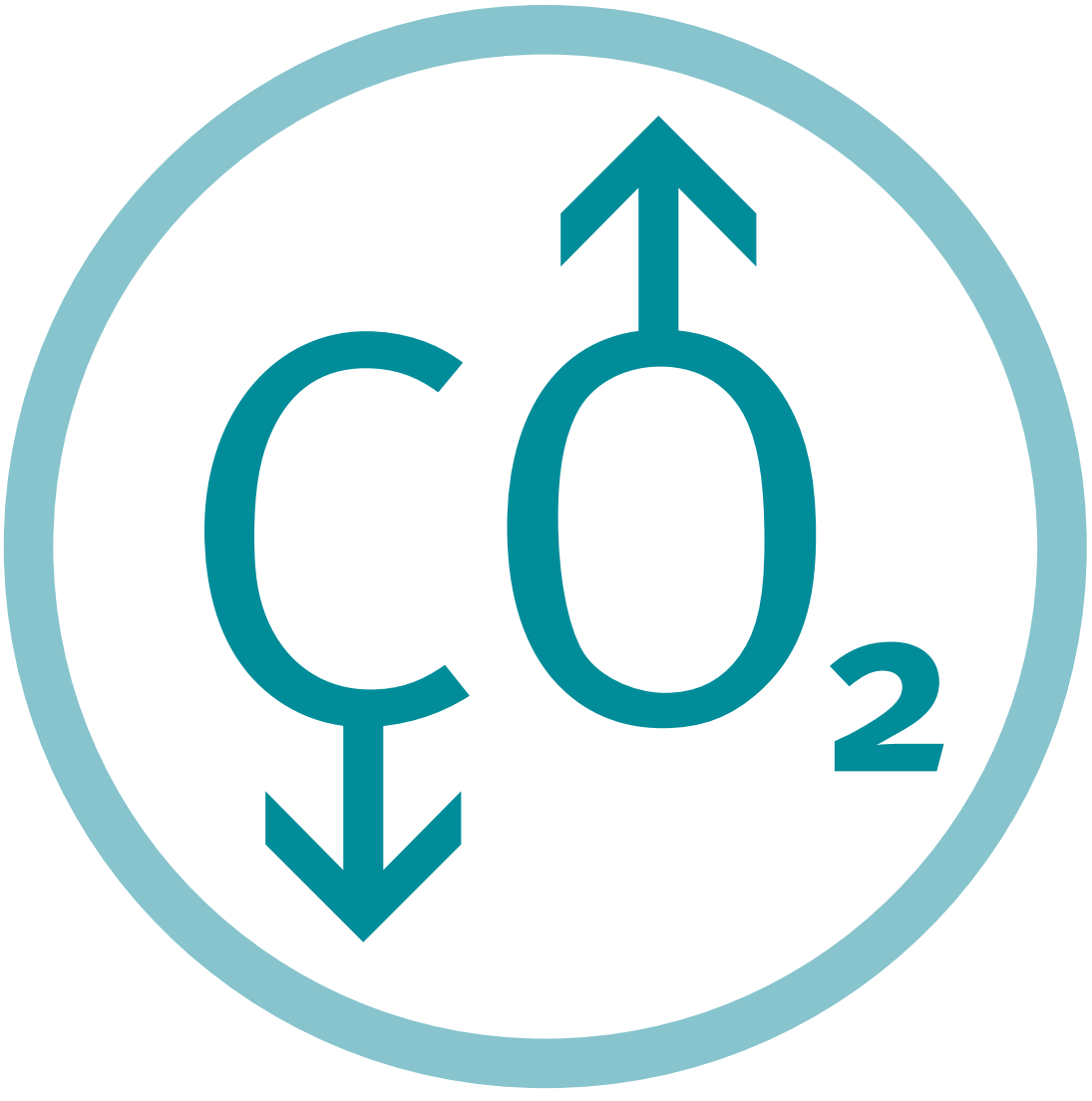
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PREFACE

Sustainable development and climate policy objectives strongly converge in aiming for environmental integrity, economic resilience and social well-being. In developing countries, and particularly in LDCs, the agricultural sector (including crops, livestock, forestry and fisheries) is the largest provider of employment and opportunities for land/ocean stewardship. Thus, synergies between sustainability and positive climate action must be better reflected in strategies for crops, livestock, forestry and fisheries that jointly lead to improved food security, increased income, inclusive rural development and sustainable natural resources use.

Recognizing that sustainable development comprises the economic, environmental and social aspects of human activities, FAO has launched the Greening the Economy (GEA) initiative in order to simultaneously address the three pillars of sustainability and effectively contribute to the objectives of the United Nations Conference on Sustainable Development that will be held in Rio in 2012. GEA refers to ensuring the right to adequate food, as well as food and nutrition security – in terms of food availability, access, stability and utilization – and contributing to the quality of rural livelihoods, while efficiently managing natural resources and improving resilience and equity throughout the food supply chain, taking into account countries individual circumstances.

Based on lessons learned from the current climate policy process – where agriculture has played to date a too minor role – this paper examines how stronger sustainability criteria and a wider focus on payment for ecosystem services can provide the pathway to significantly increase the amount of climate financing directed towards the agricultural sector for sustainable development.

For this transition to happen, and in order to scale up climate finance for agriculture to the levels necessary to implement effective action in developing countries, this paper argues that agriculture should be explicitly included in future climate mechanisms, by expanding the range of currently available methodologies and by simplifying monitoring, reporting and verification approaches.

Importantly, this paper points out that, in order to effectively couple climate financing with strong and measurable sustainable development criteria, there is a need to move beyond carbon as a standalone tradeable commodity, by increasingly valuing the significant range of additional ecosystem and socio-economic services provided by sustainable agriculture practices and programmes that simultaneously address climate concerns and sustainable rural development priorities.

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EXECUTIVE SUMMARY

The Rio Declaration (RD) and the United Framework Convention on Climate Change (UNFCCC), both subscribed internationally at the 1992 UNCED Rio Summit, share at the core the same fundamental principles of sustainable development. These relationships are relevant to translating into action the emerging concept of green economy – particularly in the context of the "Greening the Economy with Agriculture" (GEA) initiative, which FAO is developing towards Rio+20. One important concept emerging from a joint RD UNFCCC analysis is that there can be no sustainable development under unabated climate change. Therefore climate adaptation and mitigation solutions are fundamental components of sustainability; furthermore, in order to be relevant to least-developed countries (LDCs), such response actions should exhibit strong food security, ecosystem resilience and rural development components. It follows that future climate policy agreements consistent with sustainable development criteria and relevant to LDCs should include prominently agriculture, forestry and fisheries issues.

By contrast, agriculture is severely under-represented in the range of adaptation and mitigation activities that are possible under existing climate policy agreements. For instance, very few agricultural methodologies have been developed to date for the clean development mechanism (CDM) of the Kyoto Protocol (KP); in addition, most registered projects fail to sufficiently address key sustainability issues of importance to FAO: food security and sound rural development. Indeed, the terms "agriculture", "food security", "hunger", "rural development" and even "ecosystem" appear very sporadically in official UNFCCC decisions and agreements; by contrast the term "forest" appears several dozen times, reflecting growing attention towards REDD+ as a means to achieve sustainability of forest ecosystems and communities.

In the run-up to 2012 and beyond, greater attention to the food and agriculture sectors can be achieved in several ways. Technically, by extending the range of what is possible under the UNFCCC framework, such as helping to develop new

methodologies for mitigation and adaptation projects in agriculture, seeking to use the Copenhagen Green Climate Fund (GCF) to promote such activities in LDCs. Politically, at a minimum more explicit language pointing to agriculture, food security and rural development must find its way within the ongoing Ad-hoc Working Groups on Long-term Agreements (AWG-LGA) and the Kyoto Protocol (AWG-KP).

In the context of developing new mechanisms for agriculture, it should be likewise recognized that carbon markets alone cannot provide a major source of funding for agriculture and forestry – at least not on the scale of the USD100 billion annual financial flows necessary to respond to climate change in LDCs. This is because the carbon credits that could be generated in the food and agriculture sectors, including those from REDD+, albeit potentially large, will continue to be poorly accepted in regulatory markets in developed countries – due to permanence problems and measurement uncertainty – and therefore will not be sold in large volumes. Indeed, the EU-ETS – the largest such market today – will not allow carbon credits from *any* land-based project until at least 2020. At the same time, emerging small regulatory cap and trade systems and voluntary markets will continue to lack enough liquidity to accommodate land-based credits in sufficiently large volumes.

Building on a range of lessons learned in the climate policy arena, this paper suggests that the nascent FAO GEA process could help overcome these gaps and fill an important niche, by proposing and implementing novel climate funding streams for agriculture projects based on payments for ecosystem services (PES), i.e., by identifying a range of ecosystem and social benefits that, while still highly relevant to building climate change responses in LDCs, decisively move beyond carbon as the sole climate currency, allowing for a significant role for public as well as private funding. These services would target achievements such as improved water availability and quality, reduced pollution from inorganic fertilizer, enhanced community level bio-energy systems and re-cycling, etc.

Simplified rules for measurement, reporting and verification procedures (MRV) should likewise be developed, to insure that such multi-functional projects are easily developed by LDCs participants, while maintaining internationally accepted validation standards. Because of the large funds needed to meaningfully achieve these goals, specific lobbying for priority Green Climate Funding should be sought. A set of relevant activities and timelines are identified in this report, focusing on pilot activities and dedicated funding for new project ideas.

In conclusion, FAO can strongly support and facilitate enhanced activities in the food and agriculture sectors and play a fundamental role in fostering sustainable development in LDCs while combating climate change. Concerted action must focus on those activities that link adaptation and mitigation actions for effective climate response, but that also include a range of ecosystems and social services that promote decisively food security, ecosystem resilience and rural development.

ACRONYMS

AF	Adaptation Fund
AWG-KP	Ad-hoc Working Group on Kyoto Protocol
AWG-LCA	Ad-hoc Working Group on Long-term Cooperative Action
CAR	Climate Action Reserve
CDM	Clean Development Mechanism
COP/MOP	Conference of the Parties serving as Meeting of the Parties
DNA	Designated National Authority
EC	European Commission
EU-ETS	European Union Emission Trading System
FAO	Food and Agriculture Organization
GCF	Green Climate Fund
GEA	Greening the Economy with Agriculture
JI	Joint Implementation
KP	Kyoto Protocol
LDC	Least Developed Countries
MRV	Measurement Reporting and Verification
NAMA	Nationally Appropriate Mitigation Action
NAPA	National Adaptation Plan of Action
PDD	Project Design Document
PES	Payment for Ecosystem Services
PoA	Programme of Activities
RD	Rio Declaration
REDD+	Reduced Emissions from Deforestation and Forest Degradation+
SD	Sustainable Development
UNCED	United Nations Conference on Environment and Development
UNCSD	United Nations Conference on Sustainable Development
UNEP	United Nations Environmental Programme
UNFCCC	Framework Convention on Climate Change

INTRODUCTION

The reality and the growing threat of climate change in the 21st century provide evidence that global economic growth is out of step with the planet. Some have identified climate change with the biggest market failure of our times[1]. The climate system – defined as the totality of our planet's physical and biological realms, including atmosphere, hydrosphere, biosphere, geo-sphere and their interactions[2] – provides objective metrics for quantifying such growing discordance of growth versus planet; one that climate policy defines as *dangerous anthropogenic interference with the climate system*[3].

Since the beginning of the industrial revolution, atmospheric concentrations of trace gases have grown exponentially; global mean surface temperature is about 0.6°C above long-term means; precipitation patterns are shifting towards more intense events in many regions; nine out of the ten warmest years on record have happened in the past decade. More is likely to come in the near future – unless emissions are reduced significantly: continued warming; increased frequency of extreme events; stronger storm surges in low-lying areas; increased aridity of continental interiors; glacier melt and sea ice reductions; sea-level rise. As a result, ecosystems and human activities are at risk, endangering food security and economic growth[4].

Many of the climate events we already observe today demonstrate the vulnerability of our world, be it developed or developing. Such risks are projected to continue to increase, through the spread of pest and disease eroding ecosystems health; shifts in seasonality affecting previously stable ecological rhythms; increased frequency of heat stress, droughts and flooding disrupting people and agricultural production alike.

There is no doubt that our current modes of production and lifestyles are the basis for such increased risks. The implication is that fighting climate change by stabilizing concentrations of greenhouse gases in the atmosphere[5] is one of the *condicio sine qua non* for achieving sustainable development.

1 Stern, N., 2007. Climate change, ethics and the economics of a global deal. Lecture delivered at the Royal Economic Society, 29.11.2007, London.

2 UNFCCC, article 1.3

3 UNFCCC article 2

4 IPCC AR4, WG I

5 IPCC AR4, WG II

It is not surprising therefore that both the Rio Declaration on Environment and Development and the UNFCCC saw their birth at the same conference, the 1992 UNCED Earth Summit – alongside the other three key agreements, i.e., Agenda 21, the Convention of Biological Diversity and Forest Principles – detailing goals and means for achieving sustainability in all of its dimensions.

The agriculture, forestry and fisheries sectors can offer significant opportunities to address the fight against climate change within robust sustainable development paths, especially in LDCs, by offering solutions that reduce negative impacts on land and water resources, enhance ecosystem management and services, improve food security and generate income opportunities, leading to production systems and rural livelihoods that are more resilient to shocks and allow for better resource use efficiency.

BACKGROUND

UNCED and UNFCCC Common Principles

The Rio Declaration (RD) provided twenty-seven principles to guide sustainable development around the world. Many of these found their expression within the legally binding UNFCCC, produced at the same summit and signed shortly thereafter, on May 9th 1992 in New York. The inherent link between the principles to fight climate change and achieve sustainable development can indeed be referred back to these two pioneering documents. The first four principles of the RD identify a set of core guidelines that were further elaborated by UNFCCC. In particular, principle 4 states that *to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it*. The UNFCCC clearly addresses these principles from the perspective of global environmental protection; in fact, article 2 expands them, by defining planetary conditions needed for sustainable development: stabilization of greenhouse gases in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system[6]. This fundamental definition implies that sustainability can only be achieved within environmental stability. In this novel context, economic growth cannot be considered sustainable as long as it forces the global climate system out of balance, beyond a recognized threshold[7].

Article 2 of UNFCCC further defines the scale and the timing of the efforts required towards this goal: *within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.* Thus, for UNFCCC, environmental stability is dynamic: the ultimate goal is to stabilize the climate system, not at pre-industrial level – which is impossible – but at least at levels and within a timeline sufficient to avoid pushing ecosystems, food security and development prospects out of balance. Using the fight against climate change as a new, overriding principle, the UNFCCC in essence provides an operational guide to the RD.

6 Dangerous level is any warming above 2°C in mean global temperature. Concentrations of CO_2 need to stabilize below 450ppm for this, implying global emissions peak by 2020, with reductions of 20-45 percent by 2030 and 70-80 percent by 2050 with respect to 1990.

7 Equilibrium between economic growth and natural resources implies that ultimately GDP must also stabilize.

In the pre-amble to Article 1, UNFCCC affirms the fundamental principles of sustainable development, in particular that *responses to climate change should be coordinated with social and economic development in an integrated manner, with a view to avoiding adverse impacts on the latter, taking into full account the legitimate priority needs of developing countries for the achievement of sustained economic growth and the eradication of poverty.* At their core, therefore, the basic tenets of UNFCCC prefigure those at the basis of the Green Economy: i) Low carbon; ii) resource efficient; and iii) socially inclusive[8]. To this end, the UNFCCC preamble states that *all countries, especially developing countries, need access to resources required to achieve sustainable social and economic development and that, in order for developing countries to progress towards that goal, their energy consumption will need to grow, taking into account the possibilities for achieving greater energy efficiency and for controlling greenhouse gas emissions, including through the application of new technologies on terms which make such an application economically and socially beneficial.*

Food and Agriculture within UNFCCC

It is useful to analyze how RD and UNFCCC guiding principles relate directly to the food and agriculture sectors, which include agriculture (crops, pastures and livestock), forestry and fisheries - in agreement with FAO definitions. Furthermore, the FAO definition of sustainable development is herein considered alongside the RD: *Sustainable Development is the management and conservation of the natural resource base, and the orientation of technological and institutional change in such a manner as to ensure the attainment and continued satisfaction of human needs for present and future generations. Such sustainable development conserves land, water, plant and animal genetic resources, is environmentally non-degrading, technically appropriate, economically viable and socially acceptable.*[9]

The UNFCCC recognizes among its primary concerns the need to ensure that ecosystems are not disrupted and food production is maintained (article 2). Additionally, five specific references are made in relation to agriculture, forests and ecosystems. These relate to promotion of GHG abatement technology development and transfer in all sectors, including agriculture, forestry (4.1c); promotion of sustainable management, conservation and enhancement of GHG sinks and reservoirs, including *biomass, forests and oceans as well as other terrestrial, coastal and marine ecosystems* (4.1d); cooperation in preparing for adaptation to

8 Green Economy, UNEP Feb 21st 2011

9 FAO, 1989

the impacts of climate change; develop and elaborate appropriate and integrated plans for coastal zone management, *water resources and agriculture*, and for the protection and rehabilitation of areas, *particularly in Africa*, affected by drought and desertification, as well as floods (4.1e); and a commitment to support developing countries address climate change impacts and responses, with a focus on arid and semi-arid areas, *forested areas and areas liable to forest decay (8.c); and areas with fragile ecosystems* (8.g).

Despite such important explicit references to food and agriculture activities, it should be noted that UNFCCC makes no reference to rural development and only one to LDCs (Article 4.9). Yet rural development is fundamental to allow smallholders and communities in LDCs achieve efficient use of land and water resources while implementing climate change responses[10]. Furthermore, the RD makes no reference to the terms *agriculture, forest, fisheries, food, hunger, rural development* – while the term *ecosystem* is mentioned only once (principle 7).

The Kyoto Protocol (KP), entered into force on Dec. 11th 1997, formalizes rules for operationalizing key principles of UNFCCC, in relation to emission reduction commitments of Annex I parties, as well as establishing flexible financial mechanisms and international emission trading. The KP mentions the term *agriculture* three times; *forest* ten times; while no explicit reference is made to *ecosystems*, *rural development* and *LDCs*. More specifically, the KP promotes *sustainable forest management practices, afforestation and reforestation* (2.1a ii); sustainable forms of *agriculture* in light of climate change considerations (2.1 a iii); R&D and increased use of *renewable forms of energy* (2.1. a iv). The latter includes implicitly agriculture and ecosystems at large, through promotion of efficient use of biomass resources for energy to achieve low carbon growth in a resource efficient and socially inclusive manner.

The pivotal components of the KP that address the food and agriculture sectors are Article 3.3 and 3.4 – and Annex 16 to CP1. In particular, articles 3.3 and 3.4 regulate the national reporting of GHG emissions related to Land Use, Land Use Change and Forestry (LULUCF), limiting mandatory reporting of land carbon sources and sinks to afforestation, reforestation and deforestation activities; article 3.4 allows parties to opt for reporting of additional LULUCF categories[11]. In particular, LULUCF CDM projects are currently limited to afforestation/reforestation (A/R) activities in relation to carbon sequestration. In addition, and importantly, agricultural project activities under the CDM can target mitigation in non-CO_2 gases.

10 UNEP GE; GEA.

11 16.CPM1 1. (e): The implementation of land use, land-use change and forestry activities contributes to the conservation of biodiversity and sustainable use of natural resources.

The other reference to *agriculture* and *forestry* in the KP is Article 10, seeking to support regional programmes containing measures to *mitigate* climate change and measures to facilitate adequate *adaptation* to climate change, including in the *agriculture, forestry and waste management* sectors. Adaptation technologies and methods for improving spatial planning are also supported (10.b i).

UNFCCC Adaptation Fund, REDD+, Green Climate Fund

Adaptation is fundamental in limiting the adverse effects of climate change in coming decades, increasing the resilience of vulnerable systems to climate shocks. Decisions on implementing adaptation actions are based on article 4.8 and 4.9 of the UNFCCC and Article 10 of the KP, and include Decision 5/CP.7, 2001 and Decision 1/CP.10, 2004 (the Buenos Aires programme of work on adaptation and response measures). National Adaptation Programmes of Action (NAPAs) prioritize urgent and immediate adaptation needs for LDCs (Article 4.9). The NAPAs draw on existing information and community-level input, benefiting from knowledge of local coping strategies. Successful adaptation not only depends on governments but also on the active and sustained engagement of stakeholders (Nairobi work programme) – including national, regional, multilateral and international organizations, the public and private sectors, civil society. The objective of the Nairobi work programme is to help countries to improve their understanding and assessment of the impacts of climate change and to make informed decisions on practical adaptation responses. The UNFCCC maintains a coping strategies database to facilitate the transfer of knowledge from communities already coping with specific hazards under current or evolving climate change.

Developing countries require international assistance to support adaptation (Articles 4.4, 4.8 and 4.9). This includes funding, technology transfer and capacity building. Funding for adaptation is provided through the financial mechanism of the UNFCCC, currently operated by the Global Environment Facility (GEF) and the Adaptation Fund Board (AFB). Funding opportunities include: the GEF Trust Fund, including support for vulnerability and adaptation assessments as part of national communications; Least Developed Countries Fund (LDCF) and Special Climate Change Fund (SCCF) under UNFCCC; Adaptation Fund (AF) under the KP, managed by the AFB. The latter is funded primarily through a 2 percent levy on every Certified Emission Reduction (CER) issued by the UNFCCC. It currently totals roughly 50 million CERs, or about USD650 million at current secondary CERs spot prices. In operational terms, the UNFCCC Adaptation Fund Board began calls for project funding in 2010; only one such project, focused on reducing vulnerability from coastal erosion in Senegal, has been funded to date.

The current state of the art on post-2012 UNFCCC agreements were elaborated in the Copenhagen Accord (CA) and formalized via the Cancun Agreements at COP16

in December 2010 – following recommendations of the Ad-hoc working groups on long-term commitments and post-2012 Kyoto Protocol decisions (AWG-LCA and AWG-KP). These documents clarify that dangerous anthropogenic interference with the climate systems is reached above a risk threshold of 2˚C warming, possibly to be revised to 1.5˚C; that significant emission cuts must be achieved early towards this goal (CA 2 And CA 12); that enhanced efforts on adaptation are needed beyond those stated in UNFCCC (CA 3); that developing countries, especially fast growing economies, must contribute to internationally monitored emission reductions via projects approved and funded via NAMAs (CA 5). Importantly, these documents provide support for REDD+, *reducing emission from deforestation and forest degradation and the need to enhance removals by forests* (CA.6); and promote *scaled up, new and additional, funding to enable and support enhanced action on mitigation, adaptation, technology development, technology transfer and capacity building*. The level of funding for all of these activities is specified through the Copenhagen Green Climate Fund (GCF), approved in Cancun, at the level of USD30 billion annually for the period 2010-2012, and USD100 billion annually by 2020. This represents the cost of fighting climate change in developing countries through adaptation and mitigation actions expected by UNFCCC[12].

At COP 16 in Cancun, these principles were re-affirmed and strengthened in terms of the Cancun Adaptation Framework (CAF), by aiming at building resilience of socio-economic and ecological systems, including through economic diversification and sustainable management of natural resources (CP16 14b). Such decisions signal a growing convergence of UNFCCC principles with the concept of Green Economy, recognizing the need for a paradigm shift towards a low-carbon society based on innovative technologies and sustainable production and consumption lifestyles – while ensuring a just transition of the workforce that creates decent work and quality jobs (CP16 article 10).

The food and agriculture sectors continue to be extremely relevant to these discussions. Yet again, the terms *agriculture, food, rural development* did not appear explicitly in either the Copenhagen Accord or the Cancun Adaptation Framework. On the contrary, the term *forest* appears six times in the CA, and thirty-nine times in the AWG-LCA CP15 progress report. As for the CP16 AWG-LCA documents, the terms *agriculture and food security* appear only once – as a footnote to the Adaptation Framework, CP16 article 14a; the term *rural development* is never mentioned. By contrast, the term *forest* appears fifty-two times. Similarly, the progress report of CP16 AWG-KP never mentions *agriculture, food, rural development*, while the term *forest* appears twice.

12 UNEP further estimates that over USD200 billion annually are needed from now till 2050, in order to promote sustainable growth in the agriculture sectors of LDCs.

PRINCIPLES FOR AN ENHANCED CLIMATE AND AGRICULTURE FOCUS

As the recognized motor of growth in LDCs[13], as well as the repository of ecosystem-based activities upon which planetary and people's health strongly depend[14], the food and agriculture sectors can play a prominent role in helping address the fight to climate change, while providing for sustainable rural development. Indeed, climate mitigation and adaptation activities in agriculture can promote long-term resiliency of production systems, while delivering cost-effective reduction of GHG emissions[15].

As stated in the Cancun Agreements, climate responses must be extended in scope, sectorally and via programmes of activities in order to reach the scale of emission reductions necessary to stabilize global climate to below 2°C. Developing countries must be brought into future agreements, through development of nationally appropriate mitigation actions (NAMAs), to be monitored nationally for the most part, but including specific large-scale mitigation projects that are monitored internationally and funded through the GCF. Many such projects will be undertaken in the food and agriculture sectors of LDCs.

To this end, FAO could take the lead in helping the international community design and implement expanded options for agriculture that are relevant to future climate agreements. This could be facilitated, for example, by piloting new activities that extend agriculture project methodologies, as well as by promoting climate response activities with sustainable development benefits relevant to FAO, including increased attention to food security and rural development.

Greening the Economy with Agriculture

The concept of Green Economy (GE) refers to increased attention towards "green" activities and jobs, with a main focus on renewable energy and low-carbon processes along the value chain, from production to consumption. It is not a substitute for sustainable development, but rather a motor for achieving it, pointing to fundamental changes in the current economic system, seeking long-term sustainability in the context of environmental and social balance. This implies that a green economy must be aligned with Article 2 of UNFCCC, and as such it needs to operate within a

13 UNEP, Towards a Green Economy, Feb. 2011

14 GEA, FAO Position Paper, Feb. 2011

15 Tubiello *et al.*, 2009.

relatively swift timeframe, i.e. one that leaves enough time for ecosystems to adapt, for food security to be improved, and for sustainable economic growth to proceed.

According to the recent UNEP GE book[16], a green economy in practice means: 1) low-carbon growth; 2) resource efficient; and 3) socially inclusive. The UNEP study analyzes how these concepts translate in practice within ten key activity sectors, including agriculture. In order to have a more complete definition of *greening the economy with agriculture* (GEA), FAO adds the following definition: "*Greening the economy with agriculture refers to increasing food security (in terms of availability, access, stability and utilization) while using less natural resources, that is increasing nutrient and energy efficiency throughout the food value chain.*" Such definition is expanded upon using an ecosystem approach, one that grounds sustainability in the respect of the carrying capacity of ecosystems upon which food fiber fisheries production depend: "*Greening the economy can be achieved by applying an ecosystem approach to agriculture, forestry, fisheries management in a manner that addresses the multiplicity of societal needs and desires, without jeopardizing the options for future generations to benefit from a full range of goods and services provided by terrestrial and marine ecosystems.*"

The definition above implies that a GEA framework for action should include climate change adaptation and mitigation responses in agriculture and forestry, with a focus on supporting only those that are also conducive to preserving biodiversity, increasing food security, promoting sustainable use of natural resources, enhancing ecosystems resilience and generating rural development opportunities.

Implementing activities with a climate focus would not be an easy task for GEA however, given that the carbon intensity of agriculture is today about four to nine times the world average[17]. In the context of including a climate mitigation component into its strategic goals, GEA will therefore need to promote sustainable activities in both intensive and extensive agricultural systems. The first dominates internationally traded food products and affects food security through supply and price dynamics; additionally, it generates most GHG emissions from agriculture, except for deforestation. The second deserves particular attention, since it is intrinsically linked to reducing food insecurity and supporting rural development in LDCs.

16 UNEP, 2011, Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication, www.unep.org/greeneconomy

17 Global carbon intensity is about 1 ton CO_2eq/USD1 000 GDP; based on 2005 data. Agriculture emits globally 10-13 percent of the world GHG—over 30 percent if deforestation is included—against a 3 percent share of world GDP (i.e. about USD1 800 billion annually). Thus the carbon intensity of agriculture is roughly 4 ton CO_2eq/ USD1 000 (over 9 ton CO_2eq/USD1 000 with deforestation).

IDENTIFYING GAPS AND ADDRESSING NEEDS IN AGRICULTURE

Based on lessons learned from the current climate policy agreements and their implementation mechanisms, a number of proposals can be made in order to strengthen the role of the agriculture sectors in fighting climate change while promoting development in LDCs. To this end, it is proposed that the FAO GEA initiative could help to achieve three sets of goals. First, it should promote inclusion of key food and agriculture explicit terminology in future climate policy – leading to increased attention to, and acceptance of, these sectors within regulated climate response mechanisms – as well as promote development of practical project methodologies. Secondly, it should focus on strengthening the sustainability component of future adaptation and mitigation, to include strong food security and rural development dimensions of relevance to LDCs. Thirdly, it should promote international acceptance of new agriculture project activities, based on a range of ecosystem and social services beyond carbon, with simplified measurement, reporting and verification (MRV) schemes, to facilitate participation of LDCs.

Enhancing the role of agriculture in climate mechanisms

A specific focus on food security, poverty reduction and rural income creation requires policy activity and lobbying aimed at increasing formal references to agriculture, food security and rural development in future climate agreements, promoting eligibility of food and agriculture projects for adaptation and mitigation. Such a policy effort needs to be supported in parallel by technical development and know-how, aimed at providing the eligibility criteria and project design specifications needed to implement in practice climate projects in agriculture. FAO is well endowed with both the policy focus and technical resources needed to support such processes.

Previous chapters have already underlined the poor reference to agriculture and rural development in current climate documents, which needs to be overcome in future policy work. On the technical side, dedicated efforts could be developed under a FAO GEA program, focusing for instance on developing a suite of new CDM methodologies for the food and agriculture sectors, aimed at expanding the existing limited range – narrowly focused on methane capture and flaring from animal waste management systems. Needed new methodologies include methane emissions reduction from rice fields through more efficient water use; reductions of N_2O emissions through more judicious use of fertilizers; promotion of agro-forestry systems for enhanced resilience and carbon sequestration.

Sustainable development criteria

As discussed, article 12.2 of the KP puts sustainable development ahead of mitigation goals in UNFCCC flexible mechanisms. Yet operationally, verification of sustainability of projects is left to a rather simple procedure, involving declarations from Designated National Authorities (3/CMP.1)[18]. Indeed, millions of carbon credits issued to date come from projects whose link with sustainable development is rather weak[19].

A fuller and credible assessment of the sustainability of climate projects must be sought under future agreements. For instance – respecting the role of national circumstances recognized by both RD and UNFCCC principles – national authorities could be asked to certify sustainability characteristics of projects based on a list of criteria explicitly chosen by the COP/MOP. Successive verifications of adaptation and mitigation projects would also need to focus on such aspects.

To this end, a FAO GEA initiative could provide significant support in devising, implementing and monitoring sustainability principles for adaptation and mitigation project activities in the food and agriculture sectors, with reference to issues relevant to LDCs, such as food security, gender, biodiversity, conservation, rural development. This would ensure that agriculture projects designed to address climate change also meet credible targets aimed at improving lives in rural communities.

FAO could promote the creation of an Agriculture Panel or Working group, serving the international climate policy and technical support arena, in order to develop new agriculture methodologies in line with food security and sustainable rural development criteria.

Beyond carbon: Payments for ecosystem and social services

Perhaps the most sobering lesson learned from regulatory and voluntary markets is that carbon alone cannot provide enough financial flows to LDCs, at least not on the scales necessary to fight climate change and promote rural development. First and foremost, carbon finance for agriculture and forestry is and will continue to be very limited. On the one hand, the EU-ETS, representing the largest regulatory market, has already decided not to accept compliance via land-based carbon credits until at least 2020. On the other hand, voluntary markets – which by contrast provide an attractive outlet for land-based carbon credits – are characterized by very low volumes and

18 For instance, letters of endorsement to CDM projects routinely refer to reduction of GHG emissions or enhanced employment opportunities as sufficient sustainability criteria

19 The EC recently banned, starting in 2012, the use of CERs generated from destruction of industrial gases, quoting lack of sustainability as a rationale. Over 500 million CDM offsets are affected

hence limited demand[20]. In essence, there will not be enough buyers for the potentially large supply of carbon credits that could be generated in coming decades through REDD+ and other land-based projects. In particular, total carbon-based financial flows towards food and agriculture activities are and will continue to be small, compared to what is necessary to support climate response actions in developing countries – a figure indicated by COP16 in the order of USD100 billion per year by 2020.

GEA can help the international community to move beyond carbon as the main monetize-able commodity against which to reward land-based climate mitigation activities, for example by promoting payments or funding based on a range of ecosystem and social services[21] that are highly relevant to climate change responses – such as improved water availability and quality, preservation of biodiversity, soil conservation, reduced use of chemical fertilizers, increased income opportunities, etc. These efforts would help to overcome many of the current difficulties that limit contribution of the food and agriculture sectors in international climate efforts, while decisively supporting rural development (16.COP/MP1 1.e). Furthermore, a joint climate-agriculture focus could provide the platform needed to finally define a suite of payments for ecosystem services that are entirely based on agriculture as a whole provider of bundled benefits, as opposed to paying for ecosystem functions in isolation[22].

Beyond 2012

To date, the AWG-KP work on LULUCF has succeeded in extending REDD to REDD+ – *reducing deforestation and forest degradation*" plus *conservation of forest carbon stocks, sustainable forest management, enhancement of forest carbon stock* – by considering forest management[23]. REDD+ should be further expanded, to include sustainable agricultural practices and food production techniques at least within and near forested areas, with a focus on conserving land, biodiversity and ecosystems, while providing enhanced livelihood and economic opportunities to local communities in LDCs. In fact, it can be argued that since most drivers of deforestation arise from agriculture – whether it is slash and burn or conversion for high value crops and livestock products – effective REDD+ strategies cannot be achieved without a strong focus on agriculture, i.e., they require specific intervention outside of the forest perimeter.

20 Tubiello *et al.*, 2009

21 Ottaviani, and Scialabba, 2011

22 Ottaviani, 2011

23 Consideration of further commitments for Annex I parties under the Kyoto Protocol. Cancun, CMP 6

A GEA effort could address such gaps by proposing a suite of payments for ecosystem and social services in agriculture, in connection with REDD+, to be later expanded to agricultural activities away from forested areas, maximizing the linkages between climate responses on the one side, and food security and rural development on the other.

In parallel with key work on REDD+, GEA could likewise promote, design and develop agriculture project activities generating credits without permanence problems, i.e. associated to non-CO_2 GHG emission reductions rather than to carbon sinks. Such efforts would be particularly relevant to the greening of agriculture in intensive production systems of developed or emerging economies, generating incentives that could be used towards domestic action.

Targeting "outside the box" project activities

Given a strong focus of a GEA program on enhancing food security and increasing efficiency of value chains, novel opportunities could be explored to seek reduction of the roughly 50 percent waste that is reported in both developed and developing countries in relation to food. By targeting increased efficiency in the flow and utilization of food products – whether at the post-harvest storage phase in developing countries, or at the end of the value chain in developed countries (supermarkets, households) – significant progress towards reaching GEA goals could be reached, regardless of whether credits could be claimed from reduced waste streams.

In addition, credits for ecosystem services associated to adaptation and mitigation activities could be marketed via pilot programs, under funding from the GCF, by targeting UNFCCC project activities that, while responding to climate change, also result in more efficient use of chemical inputs – currently responsible for significant pollution in addition to GHG emissions, such as inorganic fertilizers – or in more efficient use of soil and water resources.

RECOMMENDATIONS

Many opportunities exist to enhance the role of the food and agricultural sectors in supporting climate change responses with strong links to sustainable development. A lead role of FAO through its GEA programme could help to ensure that land-based project activities are increasingly mainstreamed in future climate agreements, guaranteeing that strong sustainability components and greening of the economy through agriculture is promoted and enhanced, especially in LDCs. Land-based solutions leading to natural and managed ecosystems that are more resilient to future climate shocks lead to less GHG emissions and/or increased carbon storage. Implementing these strategies represent "good practice" agriculture, including the adoption of traditional and less intense cultivation practices that respect the carrying capacity of the underlying natural systems, adding a host of positive ecosystem services and community benefits in addition to carbon credits.

The following actions are suggested for developing a strong and useful role of the FAO GEA initiative, by differentiating between the short term, i.e. until 2020 and the medium term, beyond 2020.

Second Commitment Period, 2013–2020

- *Policy Action* resulting in inclusion of more explicit references to food and agriculture in future climate agreements;
- *Design and develop* enhanced sustainability criteria for land-based adaptation and mitigation projects, for use both in regulatory and voluntary markets, focusing on food security, ecosystem resilience and rural development opportunities;
- *Design and develop* new methodologies for land-based adaptation and mitigation projects, both regulatory and voluntary markets, targeting, for the CDM, a range of new projects that can generate permanent carbon credits for regulatory markets – i.e., reductions in non-CO_2 GHG rather than C-sequestration; while exploring potential for new markets, focusing on payments for ecosystem and social services beyond carbon;
- *Develop and maintain* simplified MRV rules facilitating the promotion of land-based activities. Simplified MRV systems could be promoted as a means to enhance participation by communities in LDCs;
- *Access Climate Green Funding* for new agriculture activities that exhibit both adaptation and mitigation components, targeting joint NAMA and AF international funds;
- *Lobby* for substantial climate funding beyond carbon, building on strengthened sustainability criteria, based on ecosystem services and community benefits

associated with GEA-sponsored projects: water, biodiversity, soil conservation, organic practices, job creation can be valued according to a set of objective indicators. Set up special agriculture fund to purchase such credits from a set of pilot projects.

2020 and beyond

While new ideas for funding of land-based projects are essential to expand opportunities for a sustainable and green agriculture, significant efforts should nonetheless focus on ensuring that land-based projects can be accepted in expanded regulatory markets post 2020, in order to secure the large financial flows needed to fight climate change and achieve sustainability in LDCs. To this end GEA FAO efforts should strive to:

- *Enhance partnerships* with key public and private players towards reaching a new climate agreement after 2012, one that allowed more food and agriculture project activities in flexible mechanisms, supported by high-quality sustainability targets and a range of ecosystem service indicators developed by FAO;
- *Design alternatives* to utilize non-permanent land-based credits in regulatory markets. For instance, explore requirements that future cap and trade compliance buyers be required to maintain in their portfolios a number of land-based credits, perhaps proportional to their holdings of regulatory offsets. This would be equivalent to establishing a tax on the price of future regulated emission reductions in order to pay for food and agriculture projects;
- *Promote* a full-fledged market in ecosystem and social services beyond carbon for agriculture for project activities and programmes with a strong climate component.

TIMELINE OF RECOMMENDED STEPS FOR FAO INVOLVEMENT, 2012-2020 and Beyond

ACTIVITY	TIMELINE		
	2012	2012-2020	Beyond 2020
Work to include more explicit references to agriculture, food security and rural development in ongoing climate agreements.	X	X	
Develop sustainable development guidance for food and agriculture climate projects.	X	X	
Develop new methodologies for adaptation and mitigation projects in the food and agriculture sectors.	X	X	
Develop simplified MRV rules.	X	X	X
Use Green Climate Funding and dedicated new funds to develop pilot projects to launch markets beyond carbon, focusing on ecosystem services and social benefits.	X	X	X
Partner with public and private stakeholders to insure that food and agriculture is included effectively in future climate policy agreements, focusing on both regulatory and new PES markets.		X	X

CONCLUSIONS

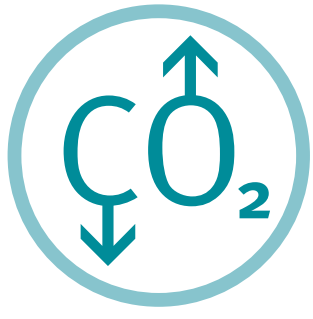
FAO can play a decisive lead role, through its nascent GEA efforts, in highlighting and promoting sustainable rural development and climate change action in the food and agriculture sectors. Such efforts can support and further develop UNFCCC focus on climate change adaptation and mitigation, yet provide new momentum by moving beyond carbon credits for food and agriculture activities, by recognizing their intrinsic climate, ecosystem services and community benefits. The overriding goal is to generate sufficient financial flows necessary to address climate change and rural development in LDCs by 2020. Efforts should be devoted to promote and operationalize robust sustainability criteria for climate change projects for use in both regulatory and voluntary markets, identifying pilot activities with joint adaptation and mitigation benefits, as well as positive implications for food security, ecosystem resilience and rural development. At the same time, significant efforts should be directed to develop new methodologies for those agricultural activities of relevance to LDCs that can already enter carbon markets, using them as leverage to develop a value system for the range of ecosystem, development and social services they also provide. In the longer run, the FAO GEA efforts should focus on developing strong partnerships with key public and private players in order to strengthen the role of food and agriculture activities within future climate policy agreements, focusing on both regulatory carbon markets as well as on new markets based on payment for the range of ecosystem and social services provided by agriculture.

REFERENCES

Ottaviani, D. and Scialabba, N., 2011. PES in the context of Green Economy. In: Ottaviani, D. and Scialabba, N. (Eds), *Payments for Ecosystem Services and Food Security*, FAO, Rome, pg. 241-263.

Tubiello, F.N., Rahman, A., Mann, W., Schmidhuber, J., Koleva, M., and Müller, A., 2009. Carbon financial mechanisms for rural development. Climatic Change (97) 1-2: 3-21. Doi 10.1007/ s10584-009-9611-5.

IPCC 2007: Easterling, W.E., P.K. Aggarwal, P. Batima, K.M. Brander, L. Erda, S.M. Howden, A. Kirilenko, J. Morton, J.-F. Soussana, J. Schmidhuber and F.N. Tubiello, 2007. Food, fibre and forest products. Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of WG II to the IPCC Fourth Assessment Report, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 273-313.



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