



## Agriculture, Food Security and Climate Compatible Development - Case Studies

### Synthesis Paper

Prepared for the Climate Knowledge & Development Network (CDKN)

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## 1. Project Description

For many developing countries ensuring food security remains a key development challenge. There are multiple aspects that constitute food security, from food production to access to markets and the resilience of food systems to external risks. Different sectors play a role, with, of course, agriculture being the most important.

There is a wealth of literature indicating that climate change will have severe negative effects on agriculture and broader factors constituting food security, especially in low-latitude countries (IPCC; 2007; Hoffmann, 2011). This is true even for moderate levels of temperature increase (2°C) and especially in smallholder systems with little adaptive capacity and high vulnerability (Vermeulen et al. 2010). At the same time, agriculture is a key source of greenhouse gas emissions (IPCC 2007; Hoffmann 2011).

Thus, “modern food systems need to be adapted to enhance food security and minimise negative environmental feedbacks” (Ericksen et al. 2010: 115). A transformation of food systems towards more flexible approaches and through lifting the productivity of small-scale farmers can make agriculture become an essential part of the solution and bring about new opportunities for the rural poor (Hoffmann 2011, IFAD 2010).

In this context, Germanwatch and Perspectives are coordinating this project with the objective to conceptually support policymakers and stakeholders in developing countries on agriculture and food security issues. The project is financed by the Climate & Development Knowledge Network (CDKN) and carried out in cooperation with experienced partners from three low-income and food deficit countries:

1. African Centre for Technological Studies (ACTS) in Nairobi, Kenya
2. Bangladesh Centre for Advanced Studies (BCAS) in Dhaka, Bangladesh
3. Fundacion Vida (FV) in Tegucigalpa, Honduras



## 2. Key Messages from Kenya

Agriculture is the mainstay of Kenya's economy directly accounting for 26% of GDP and another 25% indirectly. It also accounts for 65% of Kenya's total exports and provides more than 18% of formal employment. Further, the sector provides the livelihood of over 80% of the Kenyan population and their food security.

To address climate change in an integrated manner the Government of Kenya has developed the National Climate Change Response Strategy (NCCRS). Its primary focus is to ensure that adaptation and mitigation measures are integrated in all governmental planning processes, budgeting and in the development of objectives. Further, it calls for a collaborative and joint action with all stakeholders (private sector, civil society NGOs, faith-based organizations) and has proposed a number of adaptation as well as mitigation measures.

The Ministry of Agriculture has established an Agricultural Sector Coordinating Unit that includes ten ministries with relevance to food security aspects and climate change. Key components are knowledge management, technology and low carbon development. Further, ministries are increasingly establishing Climate Change Units to engage more actively in climate change issues. There is a growing consensus among all stakeholders that climate change must be addressed in an integrated manner with adaptation and mitigation. To date Kenya has several successful community-based programmes that can be scaled up to respond to food insecurity.

### Key Barriers identified

- Institutional and regulatory barriers
  - lack of (technical) expert knowledge within key institutions
  - existence of a silo working style among ministries working in climate change sectors (climate change is not approached from a holistic interdisciplinary perspective)
  - lack of policy incentives for climate change adaptation projects
  - scarce agricultural opportunities increase the need for efficient management of suitable areas (only 20% of Kenya's territory can be used for agricultural purposes)
- Financial barriers
  - lack of financial resources for generating project proposals to access climate change funds
  - there is no interest from the donors in financing long-term research projects
  - the majority of current projects are focused on mitigation actions and some on adaptation but very few finance an integral approach
  - lack of a systematized tool that looks at how funds can be harnessed most effectively



- Social and cultural barriers
  - several population groups do not see conservation as an important and necessary task
  - an essential social-environmental barrier is the lack of ownership
- Informational barriers
  - linkages between food security and climate change have not yet been defined clearly
  - lack of a comprehensible and complete status of food security

## Recommendations

- Technical recommendations
  - address post harvest losses
  - assess how renewable energy technologies can be harnessed to improve agriculture (e.g. solar for drying grains or biofuels)
  - examine energy issues that surround agriculture and food security
  - harness the use of water for agriculture and increase the value of fodder crops
- Regulatory recommendations
  - consider that small scale farmers have the preference to certain indigenous crops
  - avoid various efforts on similar projects through better coordination
  - consider the role of the private sector in food security matters
  - consider appropriate, accessible and affordable technologies for farmers

## 3. Key Messages from Bangladesh

Agriculture is the mainstay of the majority of people living in Bangladesh and accounts for about 20% of the country's GDP. Rice crops cover 75% of the cropping area and contribute over 95% to the total food grain production. Predominantly relying on agriculture Bangladesh is strongly dependent on seasonal weather patterns and stable climatic conditions.

To counter global warming a dozen of ministries and their line agencies are involved in addressing climate change issues in Bangladesh. The Ministry of Environment and Forest (MoEF), the Ministry of Food and Disaster Management as well as the Ministry of Agriculture are the key national actors in relation to addressing climate change, agricultural development and food security. In terms of policy action plans Bangladesh has formulated National Adaptation Programme of Action (NAPA) and the Climate Change Strategy and Action Plan (BCCSAP). Led by the MoEF the BCCSAP is built on six pillars: food security; social protection and health; comprehensive disaster management; infrastructure; research and knowledge management; mitigation and low carbon development; and capacity building and institutional strengthening.



In terms of promoting CCD there is a growing interest among policy makers, experts and development practitioners. The Ministries of Agriculture, Food and Disaster Management are already integrating climate change issues into their policies and strategies. Moreover, the Climate Change Unit under the MoEF helps relevant ministries and departments to mainstream climate change - a good initial step of synergy building.

Some key adaptation strategies in agriculture are: the promotion of climate resilient crops (salinity tolerant, submergence and drought tolerant varieties); short duration and early crops; change in cropping patterns in the context of changes in seasons and weather patterns; better farm management through new information dissemination, motivation and technological innovation; water and disaster risk management; and improve R&D in agriculture.

Major mitigation strategies in the agricultural sector are changes in tillage practices; efficiency in farming machineries; energy efficiency, reduced energy used for irrigation; promoting renewable energy for irrigation; use of organic manure instead of chemical fertilizers; agro-forestry; increasing efficiency in post harvest activities and storage; local varieties of livestock that emit less GHG and promotion of small family farms instead of large, mechanized commercial farms.

### Key Barriers identified

- Institutional and regulatory barriers
  - policy makers and key actors feel that Bangladesh, being a least developed country, has little obligation to reduce GHG emissions
  - ministries are having difficulties to build up synergies between adaptation and mitigation measures
  - lack of policy incentives for climate change adaptation projects
- Technical and infrastructural barriers
  - lack of clarity how to reduce GHG emissions within agricultural sector
  - the fabrication of technology is constrained by the lack of skilled manpower
  - lack of transport and communication infrastructures, particularly in remote coastal and inland char areas

### Recommendations

- Institutional recommendations
  - inter-sectoral collaboration and coordination from the national to the community level need to be enhanced
  - promotion of co-benefits to convince policy makers of the importance of pairing mitigation and adaptation
  - partnerships, long term investment and collaboration for the development and implementation of climate change projects are crucially important in Bangladesh



- strategies need to be people/community centred and their full potential must be utilized in conjunction with available resources
- Informational recommendations
  - government officials and policy makers need further training and knowledge-transfer how to effectively develop and implement climate change projects
  - improve R&D, local innovation and knowledge dissemination in agriculture and rural development to promote adaptation and mitigation as well as CCD in agriculture

#### Proposed Projects by local partners

- development of an early warning system to inform farmers
- provision of data on planting and harvesting times with possible yields of crops
- adaptation to changing coastal fisheries through limited brackish water and salt tolerant fish species
- coastal embankments including river banks need to be reconstructed to regulate saline water inflow into coastal areas
- integrated coastal zone management (incl. coastal afforestation) in a participative manner with bordering communities may also be an effective strategy to adapt to climate change
- revise existing disaster risk management plan

#### Identification of suitable gatekeeper institutions

No recommendation available at this stage of the project. A final selection of suitable institutions and stakeholders will be possible after finalisation of work step 3 that outlines specific requirements and responsibilities.

## 4. Key Messages from Honduras

Agriculture is an important source of income for people living in Honduras. Climatic predictions therefore threaten the national agricultural production and put food security at a high risk.

Responding to projected climate change impacts the Government of Honduras and the Ministry of Natural Resources and Environment (SERNA) have developed the National Climate Change Strategy (NCCS) to strengthen the policy framework as well as strategies and measures for (synergy building between) adaptation and mitigation. It is built on the following seven priority sectors: water resources, agriculture, forests and biodiversity, coastal marine systems, human health, risk management and hydropower. Further, 17 strategic objectives were set, of which 15 are related to adaptation and two related to mitigation. The NCCS is aligned to the Country Vision and Nation's Plan Law, which will create Regional Development Councils (CDRs) for each region so that



strategies can be potentiated at the local level.

To put climate change mitigation and adaptation strategies as well as agricultural and food security issues into action two institutions have been appointed: the Climate Change Inter-institutional Technical Committee (CCITC), comprising more than 70 institutions that work on climate change related issues and its subcommittee the Sustainable Agriculture and Climate Change Network.

### Key Barriers identified

- Institutional barriers
  - lack of institutional empowering at operational level
  - limited coordination between institutional and sectoral stakeholders
  - head institutions are facing difficulties to take advantage of the synergies that are produced through the various projects
  - limited institutional leadership on environmental issues
  - several institutions have not yet incorporated the NCCS into their strategic and operational plans
  - many actions are carried out in an isolated and uncommunicative manner (silo working-style) reducing the impact of actions
  - many local specialists work on international cooperation projects or in private efforts, reducing the capacity of response at the national institutional level
  - technical difficulties, limited financial resources and little institutional support for developing proposals for adaptation project funds
  - majority of current projects are focused on mitigation actions, only some are on adaptation and even less focus on the integral approach
  - limited access to financial resources
- Technical and knowledge barriers
  - language troubles (e.g. when formulating project proposals)
  - public and institutional personnel lack access to accurate information on climate change as well as agricultural and food security issues
  - lack of a standardized means to re-collect and disseminate information within each institution to guarantee the systematization, management and dissemination of acquired knowledge
  - universities do not offer courses for specializing on adaptation or food security
  - for local farmers it is difficult to apply new production techniques
  - limited acceptance among many social and institutional stakeholder to carry out mitigation and adaptation measures

### Recommendations

- Institutional recommendations





- public and private institutions need to “internalize” the concept of climate change
- through national, international as well as public and private stakeholder CDR's should bring CCD initiatives to regional level and articulate the issues of agriculture and food security
- a harmonization initiative that conforms particular laws of the field of climate change and agriculture (Country Vision and National Plan Law, National Climate Change Strategy and its Action Plan, National Food Security and Nutrition Strategy, Land Use Planning Law, National Forestry Law, and the Water and Sanitation Framework Law) should be initiated
- the establishment of a trust of financial resources, which operate as “seed capital” for the development of fast start projects is advisable
- apart from their territorial level, development sector and mission CCITC stakeholder should share the same CCD vision
- Regional-level recommendations
  - CCITC stakeholder on each territorial level should become “local gatekeeper” to guarantee that CCD measures are included into territorial development plans
  - the social and political platform has to focus its options on regional and local actions where successful synergies can be achieved
- Informational recommendations
  - there is the need for better knowledge sharing, training and empowerment on climate change issues
  - more accurate variability scenarios and models at the regional and local level should be build up

#### Identification of suitable gatekeeper institutions

As a suitable gatekeeper the Technical Secretariat for Planning and International Cooperation (SEPLAN) has been identified as it is responsible for attracting international finance. Additionally the Secretariat of Natural Resources and Environment (SERNA) might be qualified for the political and technical implementation of activities. The CCITC might also be a capable local gatekeeper, assisted by the CDRs. Both could complement the federal efforts and coordinate implementation and monitoring on the regional level. A final selection of suitable institutions and stakeholders will be possible after finalisation of work step 3 that outlines specific requirements and responsibilities.

## 5. Applicability at the global level

The three country profiles provide very good insights into the challenges that Kenya, Bangladesh and Honduras face as well as some suggestions how to approach the key issues of climate change and agricultural development. While some of those barriers and recommendations are very country-





specific, the majority of it is very general in character and therefore transferable to the global scale.

Taken from those listings above we can identify the following key messages:

1. Access to information is critical across all stakeholders so that a common objective can be defined and development projects are addressed in a holistic approach.
2. As developing countries often see little obligation to reduce their GHG emissions it is important to promote the co-benefits of combining adaptation with mitigation measures, especially in the context of agricultural and food security issues.
3. Climate change and agriculture are two very interdisciplinary matters that are being addressed from different ministries and at different political levels. Communication and coordination across all scales are therefore key to address developmental issues in a holistic interdisciplinary manner and to prevent a silo approach which creates duplication or gaps in efforts.
4. Due to limited technical and institutional capacity as well as a lack of financial resources, developing countries are often constrained to develop project proposals and access international climate funding. This is absurd and needs to be addressed by the international community, e.g. by providing support in terms of the form and content of the proposals.
5. The majority of small scale farmers in developing countries apply traditional practices and knowledge within the agricultural sector. Projects that target to improve agricultural productivity and make it more resilient to climate change therefore need to consider the farmers' preferences to certain indigenous crops and also that local farmers might have difficulties to apply new production techniques.
6. Climate change and food security matters require a long-term planning interval and thus long-lasting projects and programs. This needs to be realized by the international community so that future funding mechanisms are set up to continuously support countries in their CCD work.
7. It is well known that financial incentives can be used to enhance certain developmental targets. In this regard, incentives should be introduced that encourage climate friendly and sustainable lifestyles in developing and developed countries.
8. From the donor as well as the recipient perspective climate change mitigation and adaptation are often seen as individual issues to work on. As this is hardly efficient there needs to be a shift to a more integral approach that is pursued by the international community as well as found in the (developing countries') project proposals.
9. The Green Climate Fund as the (potentially) main future multilateral funding source for climate change has also as a task that "an integrated approach to funding mitigation and adaptation will be used to allow for cross-cutting projects and programmes." (GCF 2012). When designing its modalities it should take into account country-level experience such as that generated through this research.



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