



RESEARCH PROGRAM ON  
**Climate Change,  
Agriculture and  
Food Security**



# POLICY BRIEF 7

November 2012

## Paving the way for nationally appropriate mitigation actions in the agricultural sector

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Photo credit Neil Palmer (CIAT)

### Key messages

- ▶ Nationally appropriate mitigation actions (NAMAs) can provide additional resources for agriculture with multiple benefits, including adaptation, food security and sustainable development.
- ▶ Mitigation and adaptation are often inseparable and complementary in meeting multiple goals. Thus, NAMAs and national adaptation plans (NAPs) could be aligned to maximize synergies and co-benefits.
- ▶ NAMAs will require subnational policy and implementation measures to best respond to local conditions.
- ▶ NAMAs should build on existing planning processes, tools, and technologies to support new agricultural investments.
- ▶ The United Nations Framework Convention on Climate Change (UNFCCC) should enable a country-driven process for mitigation in agriculture. Developed countries must follow through on their commitments made under the Copenhagen Accord and Cancun Agreements to support mitigation actions in developing countries.

## Agricultural NAMAs

The agricultural sector faces tremendous challenges in providing food, fuel and fibre for a world population expected to reach nine billion by 2050. The availability of land for agricultural expansion is already limited and land degradation is reducing agricultural productivity in many regions. Climate change adds a further complication to meeting the global demand for food. Rising temperatures and more frequent extreme weather events will negatively affect agricultural yields, particularly in sub-Saharan Africa and South Asia (Nelson et al. 2009).

Agriculture is a major source of anthropogenic greenhouse gas (GHG) emissions and provides significant opportunities to mitigate climate change. About 70 percent of this mitigation potential is in developing countries. NAMAs are a new mechanism, provided under the UNFCCC, available to developing countries to tap mitigation potential. NAMAs are voluntary mitigation actions undertaken by developing countries “in the context of sustainable development, supported and enabled by technology, financing and capacity-building, in a measurable, reportable and verifiable manner, aimed at achieving a deviation in emissions relative to ‘business as usual’ emissions in 2020” (UNFCCC 2010).

The concept of NAMAs first emerged in the Bali Action Plan in 2007, which calls for enhanced climate change mitigation action by both developed and developing countries. The NAMA concept was later formalized in the Copenhagen Accord and Cancun Agreements. By August 2012, 50 countries had submitted NAMAs to the UNFCCC Secretariat (UNFCCC 2011, UNFCCC 2012a), ranging

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Nelson GC, Rosegrant MW, Koo J, Robertson R, Sulser T, Zhu T, Ringler C, Msangi S, Palazzo A, Batka M, Magalhaes M, Valmonte-Santos R, Ewing M, and Lee D. 2009. Climate Change: Impact on agriculture and costs of adaptation. IFPRI Food Policy Report, Washington, DC: International Food Policy Research Institute.

UNFCCC. 2010. Decision 1/CP.16 The Cancun Agreements, FCCC/CP/2010/7/Add.1, December 2010.

from national GHG emission reduction targets to policies, programmes and specific projects. Some countries plan to implement NAMAs with national resources (unilateral NAMAs), but the majority of NAMAs are contingent on international support (supported NAMAs). It is therefore important that developed countries follow through on their commitments made under the Copenhagen Accord and Cancun Agreements to support mitigation efforts in developing countries.

Mitigation actions in the agricultural sector are mentioned in 40 percent of NAMA submissions to the UNFCCC Secretariat, mainly by African countries. Proposed NAMAs focus on agricultural technologies and practices, including the restoration of degraded grazing land, use of improved seed varieties, agroforestry, application of composts, and minimum or no-tillage, all of which provide adaptation benefits.

## Early experiences

Some countries have taken a proactive role in developing NAMAs, including in agriculture. These early movers are driven by different motives: NAMAs are regarded as an entry point for a transition to a low-carbon development or green growth path, or they are seen as an opportunity to access new sources of finance for sustainable development; in some cases agricultural mitigation is needed to meet voluntary national emission reduction targets. Regardless of these countries’ motives to invest in agricultural NAMAs, they all focus on the potential synergies of mitigation, resilience or adaptation, and on food security.

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UNFCCC. 2011. Compilation of information on nationally appropriate mitigation actions to be implemented by Parties not included in Annex I to the Convention, FCCC/AWGLCA/2011/INF.1, March 2011.

UNFCCC. 2012a. Submission of more information by developing country Parties, subject to availability, relating to nationally appropriate mitigation actions, including underlying assumptions and methodologies, sectors and gases covered, global warming potential values used, support needs for implementation of nationally appropriate mitigation actions and estimated mitigation outcomes. Submissions from Parties, FCCC/AWGLCA/2012/MISC.2, April 2012.



Africa's farmers must be part of the solution for climate change. Photo credit World Agroforestry Centre - Steve Mann

Some examples of agricultural NAMAs currently under development are:

- ▶ In Kenya, the government scored agricultural technologies that most cost-effectively reduce emissions and deliver adaptation and resilience. This process identified agroforestry, conservation tillage and sustainable land management practices that should be promoted within NAMAs.
- ▶ Costa Rica is developing a NAMA proposal for its coffee sector, responsible for about 25 percent of their agricultural GHG emissions. Key components of the NAMA include applying nitrogen fertilizers more efficiently, establishing coffee agroforestry systems and increasing trees in existing systems. The establishment of agroforestry systems is simultaneously used as an adaptation strategy.
- ▶ Indonesia has voluntarily committed to reducing its GHG emissions by 26 percent by 2020 through domestically supported NAMAs. They are willing to increase the emission reduction target to 41

percent, if their NAMAs receive international support. NAMA proposals being developed for the agriculture sector include using organic fertilizers, restoring abandoned and degraded agricultural land and introducing integrated crop management systems.

- ▶ Peru is planning a national programme for scaling up agricultural waste-to-energy initiatives. The centrepiece of the NAMA proposal is a financing mechanism to facilitate farmer and agro-industry access to the capital needed for the investment costs of technologies and energy generation infrastructure. Financing will be linked to capacity-building programmes that train beneficiaries to establish and maintain technologies to ensure their efficient and long-term use.

Many other developing countries are working on establishing mitigation policies, programmes or projects in agriculture that are not labelled as NAMAs, but could be converted into this mechanism to access new sources of international support.

## The NAMA development process

The development of NAMAs is currently not strictly prescribed by the UNFCCC, making it possible for countries to proactively define the terms of a NAMA based on national circumstances and needs (Figure 1). Government support for a NAMA is crucial throughout the development process, as is the involvement of all relevant stakeholders. An entity should be selected to lead the process and the roles of different actors should be clearly assigned.

NAMA development in the agricultural sector typically starts with an evaluation of potential

mitigation actions, and their impacts on food production and other benefits and costs. Barriers that currently prevent the implementation or scaling up of mitigation activities also need to be considered. This evaluation takes place within the framework of national policies and sustainable development goals, and needs to take socio-economic and environmental circumstances into consideration. If several potential NAMAs are the outcome of this evaluation process, NAMAs can be prioritized based on criteria that reflect national development goals. Selection criteria could be, for example, the cost-effectiveness of achieving a mitigation goal, or the delivery of an optimal mix of GHG emission reductions and desired co-benefits.

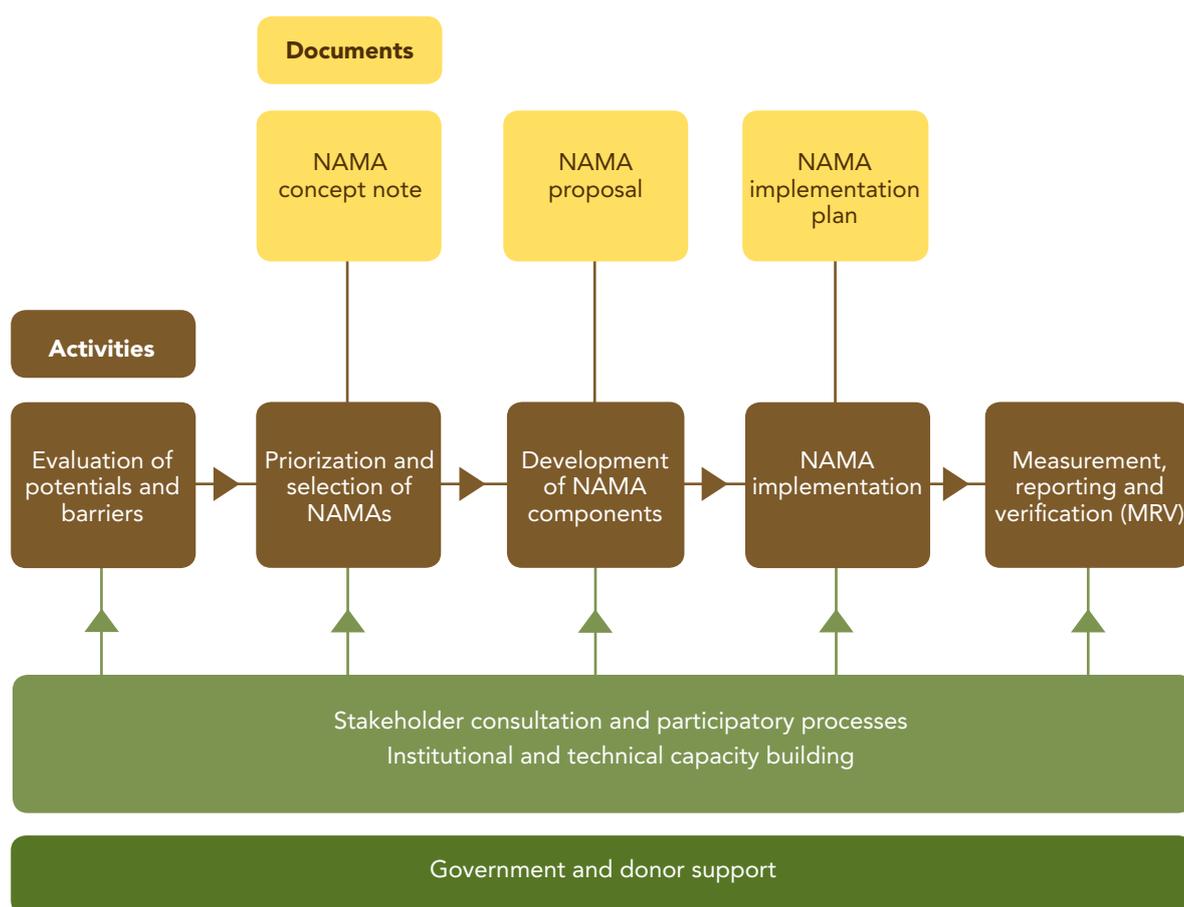


Figure 1. NAMA development process (adapted from Ecofys 2012).

Ecofys. 2012. NAMA development process. Available at: [www.nama-database.org](http://www.nama-database.org)



Many smallholders have started to embrace climate-resilient farming approaches and technologies. These include strategies that improve crop production such as using improved seed varieties, agroforestry and intercropping, and better livestock management. Photo credit Neil Palmer (CIAT)

Developers of supported NAMAs often draft a concept note, or a proposal, based on available information on the selected mitigation action. Concept notes describe what is expected to be achieved with a NAMA and can help to attract donor support in the early stages of NAMA preparation. Proposals include similar, but more detailed information than concept notes, and describe how the objective of the NAMA will be achieved. A proposal can be used to communicate support needs and the plan for NAMA implementation. A NAMA proposal typically includes the following elements:

1. Objective of the NAMA;
2. General information (such as sector, scope and type of NAMA);
3. List of activities to be carried out to achieve the objective;
4. Estimate of impacts (including direct GHG emission reductions, indirect GHG emission reductions and co-benefits);
5. Estimate of costs and description of support needs and;
6. A proposal for a MRV (measurement, reporting and verification) framework (Ecofys 2011).

Once a NAMA concept note or proposal is in place, it can be submitted to the UNFCCC NAMA Registry. At the sixteenth session of the Conference of Parties (COP), it was decided to set up a registry to record NAMAs seeking international support, which would facilitate the matching of finance, technology and capacity-building support with these actions, and recognize other NAMAs (UNFCCC 2012b). The official launch of the UNFCCC NAMA Registry, a web-based platform, is due to take place at COP 18 in Doha.

An implementation plan is the roadmap for converting a NAMA proposal into concrete action. Planning for implementation should start as early as possible and may be done in collaboration with NAMA supporters to define the implementing process, finance and MRV procedures. An implementation plan typically contains information on all actors and their respective responsibilities, together with timelines for implementing activities.

A robust MRV framework for NAMAs is a key element in demonstrating impact and ensuring the transparency of mitigation actions and support provided. Starting in December 2014, developing countries will have to submit Biennial Update Reports (BURs) providing information on mitigation actions being undertaken. However, no international guidance on how to conduct the MRV of NAMAs is yet available. Existing tools, such as IPCC inventory guidelines, the Voluntary Carbon Standard, and guidelines for reporting on adaptation and vulnerability in national adaptation programmes of action (NAPAs), can be used to facilitate measuring the performance of NAMAs and to provide general guidance to countries for establishing their MRV frameworks.

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UNFCCC. 2012b. Information note. NAMA registry prototype. Available at: [http://unfccc.int/files/adaptation/application/pdf/info\\_note\\_on\\_the\\_registry.pdf](http://unfccc.int/files/adaptation/application/pdf/info_note_on_the_registry.pdf)

## Challenges in NAMA development

Despite interest from developing countries in agricultural NAMAs, NAMA development is still in the early stages. Reasons for this slow pace include:

### General challenges

- ▶ Institutional capacity for NAMA development is weak in some countries that are interested in developing NAMAs. Support for NAMAs from developed countries – in the form of financing, capacity building and technology transfer – currently flows mainly to developing countries that have well-defined policy frameworks and government institutions prepared to lead the NAMA development process.
- ▶ Other challenges are directly related to the NAMA policy framework. The definition of NAMAs provided by the UNFCCC is vague and the existing guidance on NAMA development is minimal. This is often regarded as a barrier to NAMA development, but could also be seen as an opportunity to shape a new policy mechanism.

### Challenges specific to agriculture

- ▶ Adaptation in agriculture and resilience building are priorities for most developing countries, since the sector has an essential role for food security, rural livelihoods and economic development. Adaptation and climate change mitigation are sometimes perceived as conflicting goals and it can be challenging to align related policies.
- ▶ Many developing countries have little or no previous experience of developing mitigation projects or programmes in the agricultural sector. Under the Clean Development Mechanism (CDM) of the Kyoto Protocol, only a few agricultural activities are eligible to date, e.g. improved manure management, the use of agricultural waste for energy generation and irrigation in paddy rice. Soil carbon sequestration through sustainable land management, which holds the largest mitigation potential in the sector, has been excluded.



South Asia is considered one of the most vulnerable regions to climate variability and change due to its high population, high exposure to climatic risks, chronic food insecurity, widespread poverty, and relatively limited adaptive capacity. The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) South Asia has established a regional learning platform called 'Climate Smart Agriculture Learning Platform for South Asia (CSALP-SA)' to provide a forum for multi-sectoral climate smart learning to scientists, policy planners, civil society, and farmers in South Asia. Photo credit Neil Palmer (CIAT)

### **Synergies among mitigation, adaptation and food security**

Many agricultural technologies and practices have the potential to deliver both mitigation and adaptation benefits together with food security. For example, measures that increase soil organic matter enhance soil carbon sequestration and improve nutrient supply and soil water-holding capacity, which strengthen the resilience of agricultural systems and increase productivity. Also, trees in silvopastoral systems can raise livestock productivity by reducing heat stress for animals.

In addition, trees increase carbon storage in soils and biomass. Therefore, many mitigation measures included in NAMAs are also potential components of NAPs. These overlaps show the importance of adopting a whole-farm and landscape-level approach for integrated planning of NAMAs and NAPs to ensure efficient use of resources for their implementation. It is also important to align policies and strengthen communication and cooperation between institutions and programmes to minimize duplication or conflicting initiatives.

## Making NAMAs work on the ground

Agriculture has an advantage compared to other sectors in that many mitigation technologies and practices are already relatively well understood and available. However, these activities are often implemented at a scale too small to deliver their full potential to address mitigation, adaptation and food security.

Agricultural NAMAs can be an important option for accessing climate finance opportunities to scale up best practices in agriculture. To accelerate

the development of NAMAs, it is important that they build on existing agricultural technologies and practices with demonstrated synergies in mitigation, adaptation and food security. Countries that propose NAMAs now can take advantage of the current flexibility of the mechanism and define which mitigation actions are appropriate in their national context. There is an opportunity for pilot NAMAs to help inform and shape the international climate change debate by providing examples of how agricultural mitigation activities can be realized successfully on the ground.

This policy brief summarizes outcomes of the "Workshop on NAMAs: National Mitigation Planning and Implementation in Agriculture", held from 16-17 July 2012, in Rome, Italy, organized by the Food and Agriculture Organization of the United Nations (FAO) and the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS).

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### Correct citation

Hänsel G. 2012. Paving the way for nationally appropriate mitigation actions in the agricultural sector. CCAFS Policy Brief no. 7. CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS). Copenhagen, Denmark. Available online at: [www.ccafs.cgiar.org](http://www.ccafs.cgiar.org)

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ISSN: 1904-903X

Research supported by:

