



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



FAO/CCAFS Workshop

Scenario-guided planning for Climate Smart Agriculture

Hanoi, Viet Nam, 8-9 May 2014

Introduction

To be able to respond to the challenges of achieving food security under the pressure posed by an increasing population and the threats posed by climate change, agriculture in developing countries must undergo significant transformation. A key role at the core of this transformation can be played by Climate-Smart Agriculture.

CSA “promotes production systems that sustainably increase productivity, resilience (adaptation), reduces/removes Green House Gas GHG (mitigation), and enhances achievement of national food security and development goals”¹. The CSA approach is regarded as an “entry point for essential information on how to make agriculture, forestry and fisheries part of the solution to the negative impacts of climate change”².

The FAO Economics and Policy Innovations for Climate-Smart Agriculture (EPIC) Programme and the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) are working together with NOMAFSI to organize Climate Smart Agriculture (CSA) investment proposals and policy recommendations for Viet Nam, based on future climate and socio-economic scenarios.

This document provides the background for a workshop that will be organized on 8 and 9 May 2014 in Hanoi, Viet Nam, to review investment proposals and develop policy recommendations using future scenarios to guide planning.

FAO EPIC

¹ <http://www.climatesmartagriculture.org/72610/en/>

² <http://www.climatesmartagriculture.org/72610/en/>

In 2010, the agricultural development economics division (ESA) of the FAO initiated the Economics and Policy Innovations for Climate Smart Agriculture (EPIC) programme aimed at developing tools, knowledge and partnerships to support countries in achieving climate smart agriculture. With funding from the European Commission, FAO/EPIC has partnered with Zambia, Malawi and Viet Nam, for a project that builds the necessary technical, policy and financing basis for achieving CSA in the respective countries.

The project has four main objectives:

1. Provide an evidence base for identifying, developing and implementing practices, policies and investments for climate smart agriculture.
2. Develop a country-owned strategic framework to guide action and investment on CSA.
3. Formulate climate smart agriculture investment proposals and identify possible financing sources,
4. Build capacity to plan, implement and finance climate-smart agriculture on the basis of the results above.

To achieve these objectives, the project has both research and policy activities, as well as collaboration with international research and policy institutions including CCAFS.

CCAFS

The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS), addresses the increasing challenge of global warming and declining food security on agricultural practices, policies and measures through a strategic collaboration between [CGIAR](#) and [Future Earth](#).

Led by the [International Center for Tropical Agriculture \(CIAT\)](#), CCAFS is collaborating with all [15 CGIAR research centers](#) as well as with the other CGIAR thematic research programs.

Its objectives are to:

1. Close critical gaps in the knowledge of how to enhance – and manage the trade-offs between – food security, livelihood and environmental goals in the face of a changing climate;
2. Develop and evaluate options for adapting to a changing climate to inform agricultural development, food security policy and donor investment strategies;
3. Enable and assist farmers, policymakers, researchers and donors to continually monitor, assess and adjust their actions in response to observed and anticipated changes in climate.

CCAFS has first initiated activities in South Asia, East Africa and West Africa. Two new regions have been added to the CCAFS geographical areas being Latin America and Southeast Asia. In this initial phase the SEA CCAFS region incorporates three countries; the Kingdom of Cambodia, the Lao People's Democratic Republic and Viet Nam.

Situation Analysis

Increasing climatic unpredictability exacerbates all pressures on the agricultural production systems of Southeast Asia. Pollution, population, water supply and quality, energy, livelihoods and issues around sustainability interact. Critical challenges for CCAFS are associated with this increasingly complex and stressed agricultural landscape.

Brunei, Cambodia, East Timor, Indonesia, Laos, Malaysia, Myanmar, The Philippines, Singapore, Thailand and Vietnam constitute Southeast Asia – a geographical grouping characterized by huge disparities in Human Development Indices and governance styles. All countries are ASEAN members, except East Timor, which has applied for membership. The land surface of 4,000,000 km² is home to 620 million people, projected to increase by at least 150 million by the 2050s.

The dominant climate is hot and humid year round with high rainfall. Except for regions of high altitudes, northern Vietnam is the only major zone in Southeast Asia with a subtropical climate and cold winter. Southeast Asia's annual wet and dry seasons are driven through seasonal wind shifts triggering monsoon rains. The tropical rain belt causes additional rainfall during the monsoon.

With long coasts, many Southeast Asian countries are among the most exposed to natural hazards, in particular typhoons, storm surges, and flooding. New patterns of temperature extremes and rainfall are expected along with sea level rise that may submerge large areas in deltas.

The region has high levels of biodiversity and, after the Amazon Basin, is the second largest area of rainforest in the world. The environmental utility of the landscapes will be increasingly important, not only to the region but also to the rest of the world, in particular for sequestering carbon to mitigate the effects of climate change.

The ability of rice to survive monsoonal inundations was the cornerstone of rice-based civilizations that evolved in Southeast Asia more than 4,000 years ago. In modern times, large impacts arose from introduced agricultural species, especially the New World annual crops maize and cassava and perennial crops rubber and oil palm. None the less, in 2007 the average annual consumption of rice per capita in Southeast Asia was 197 kg and rice provided 49% of the calories and 39% of dietary protein (FAOSTAT, 2012). The Green Revolution from the 1970s onwards in Southeast Asia was characterized by very large production increases of rice, based on high-yielding semi-dwarf varieties, inputs, mechanization and intensification of rotations. The relative importance of cereals in human diets increased at the expense of legumes.

Food security is challenged by the low and dramatically falling cultivated land per capita, especially in the most productive areas of the region. One estimate is that Vietnam loses 100,000 hectares of agricultural land per year. Yet the deltas and floodplains remain the rice bowls – and all face complex constraints and development issues. Rural population densities are extremely high in the deltas where large cities provide markets as well as off-farm income. In Southeast Asia, rice is more than food: it is a focus of economic policy, a determinant of national objectives and a key plank of political stability. The leading rice exporters in the world are Thailand and now Vietnam (that imported 200,000 tons in 1979). As rice is a thinly traded commodity – with only 7% of world production sold across borders – any production shocks in these dominant exporting countries can rapidly destabilize world prices. Economic development creating new opportunities for labor has been another driver

of change that will accelerate and mechanization will be a key element of agricultural innovation.

Along with further intensification, diversification of rice-based systems through high value crops for domestic and export markets will improve small farmers' livelihoods.

Scenarios as a policy tool for adaptation planning

In South East Asia, socio-economic and climate scenarios have been developed at the sub-continental level up to 2050. Rather than attempting to forecast a single future, scenarios represent multiple plausible directions that future drivers of change take. The FAO/CCAFS scenarios process has focused on contextual drivers of change for Climate Smart Agriculture – climate change and socio-economic changes (e.g. in markets, governance, broad economic developments, infrastructure). Scenarios allow for the capturing of uncertainties and systems complexity in a coherent and plausible yet surprising and challenging fashion. Scenarios are an excellent tool for generating shared engagement, building relationships, commitments and new ideas – building greater capacity for collaborative governance to enhance adaptive capacity and sustainable policies.

The development and use of the scenarios functions as a platform for the exchange and application of knowledge and experience between researchers and policy makers, private sectors, NGOs and other societal actors.

The CCAFS scenarios process has engaged a range of stakeholders from governments, civil society and NGOs, academia, the private sector and the media, at a national level but also from regional organizations and, where appropriate, global organizations, to actively engage in the development of socio-economic scenarios.

The assumptions generated for each scenario have been used for several types of modelling including:

- Quantification through two global partial equilibrium models, IMPACT (developed by the International Food Policy Research Institute) and GLOBIOM (developed by the International Institute for Applied Systems Analysis). Socio-economic scenarios developed by the participants are combined with climate scenarios. In this process, a socio-economic scenario can be combined with multiple climate scenarios and vice versa. Because of this, a socio-economic scenario that offers few opportunities for adaptation (for instance because of low investment in infrastructure and low government support of rural communities) will play out very differently under a low climate change scenario than under a high climate change scenario.
- Conducting simulations of risk management options under the various scenarios identified through a risk management model built for the project;
- Expand the evidence base produced through econometric analysis indicators of food security, mitigation and adaptation by running simulations on these same indicators under the various scenarios identified.

Four scenarios for Viet Nam and its Southeast Asian context

In a workshop in Ha Long Bay on 5 to 7 November 2013, four scenarios were developed with a group of participants from different sectors, based on their assessment of the top factors of change for the future of agriculture and food security in Southeast Asia. These factors of change were 1. Markets, 2. Government enforcement capacity and regional collaboration as a combined factor, 3. Agricultural investment and 4. Land degradation through land use change. The most diverse combinations of the different states of these factors were presented to the participants who chose to take forward four scenarios (table 1).

Table 1. four scenarios for Viet Nam in a Southeast Asian context, outlined by four factors of change.

Factors	M arkets	E nforcement capacity and regional collaboration	A gricultural investment	L and degradation through land use change
<i>Land of the Golden Mekong</i>	Common regulated market	Strong enforcement and strong regional collaboration	High public and private	Low
<i>Buffalo, Buffalo</i>	Unregulated	Weak enforcement and weak regional collaboration	Unbalanced: high private investment in business and research	High
<i>The Doreki Dragon</i>	Common regulated market	Strong enforcement and strong regional collaboration	Unbalanced: high private investment in business and research	High
<i>Tigers on the Train</i>	Protectionism and closed market	Strong enforcement and strong regional collaboration	Low public and private	Low

Land of the Golden Mekong

In this scenario, unification of Southeast Asia in terms of political, economic and environmental concerns slowly becomes a reality. Though challenges around urbanisation and migration initially increase, ultimately institutions become effective enough to enable improved development and environmental management. Aging populations and the lack of labour due to egalitarianism become a problem – migrants from poorer countries replace the regional population in the working class but are shunned and abused. Strength and inclusiveness of governance (at least for the autochthonic population) is the key source of the significant change in food security, livelihoods and environments that can be observed. Climate resilience is strong in that respect, though biophysical vulnerabilities remain significant, especially in the form of extreme events that still sometimes overwhelm the region's adaptive capacity. The migrants become the most vulnerable groups.

Buffalo, Buffalo; water flows uphill

In this scenario we start out in 2013 looking up. ASEAN agreements appear to be going ahead. Myanmar is starting to produce more and be more economically active. Moving to 2020 we start to see more problems: there are major corruption scandals that greatly weaken national governments. High oil and food prices due to global as well as local situation and

increased demand for biofuels increases pressure for private sector to acquire land – increasing pressure on population that is dependent on farming for their living. Logging concessions to private industry lead to massive deforestation. Environmental change creates incredible regional tensions. ASEAN closes borders and cooperation between countries is lost. Food production is significantly decreased – migration and conflicts increase. 2050 sees a situation of unsustainable agricultural intensification. There is a big plantation sector, greater emphasis on processed foods, but only the rich people in the country can afford it. There is huge environmental degradation. Social conflict is rampant. Local governance and civil society at times make some progress in solving problems, but they cannot overcome the overall declining situation.

The Doreki Dragon

In this scenario, the ASEAN-facilitated development of a regional market and the increasingly effective political focus on big business in all sectors, including agriculture, drives significant change. GMOs become the norm and are no longer exceptional – it's all just "food". Agricultural industrialisation develops to the degree that agriculture, while a massive source of growth, is almost no longer recognizable as such. Smallholder farmers struggle more than ever, and very often fail, to maintain a livelihood – many become workers on highly industrial farms. Urbanisation is high. Environmental degradation and natural land conversion are extreme. Food security for the poor is very low, though food safety is stringent. The different societal classes are more divided than ever in terms of climate resilience with climate impacts being made significantly worse due to large-scale manipulation of the natural environment.

Tigers on a Train

This scenario sees Southeast Asia becoming increasingly collaborative regionally but also protectionist with regard to outside economic influences from China and other global actors. Riding on a time of high food prices in the first decades of the scenario, the region manages to use investments in agriculture that are not by themselves extremely high very effectively. The highly controlled region develops its focus from primary production more to agricultural processing, and eventually away from agriculture and toward industrialisation. Protectionist economic policies cause tensions with China and the need for continued negotiations. By 2050, some deep issues with the protectionist policies threaten to cripple the regional economy. In terms of climate resilience, this increased economic fragility threatens food security for the poorest who have felt the consequences of the shift away from agricultural development in recent decades.

Please see the workshop report for more extensive descriptions of the scenarios: :

[http://www.fao.org/fsnforum/sites/default/files/files/99_EPIC/Scenarios%20workshop%20report%20II_FSN%20\(2\).pdf](http://www.fao.org/fsnforum/sites/default/files/files/99_EPIC/Scenarios%20workshop%20report%20II_FSN%20(2).pdf)

Outline for the FAO/CCAFS workshop on 8 and 9 May, 2014 in Hanoi, Viet Nam

Workshop objective

To review and revise CSA investment proposals for Northern Vietnam together decision-makers and funders and discuss enabling policy conditions – using scenarios to test the proposals for feasibility.

Workshop logic and background

To be able to meaningfully assess the feasibility of Climate Smart Agriculture investment proposals, these have to be examined in the context of multiple scenarios representing diverse future socio-economic and climate developments. In a proposal is likely to be successful under a wide range of different conditions, this can be used as evidence for the feasibility of the proposal.

A set of diverse scenarios can be used to ask the following questions to an investment proposal:

- If a given proposal is based around a single strategy, is this strategy robust/flexible enough to be successful under different scenarios? What improvements can be made?
- Alternatively, if a given proposal provides a portfolio of strategies, which strategies in this portfolio are more or less feasible in different scenarios? What has to be changed, are additional options needed?
- Is the proposal concrete enough to even have meaningful information about how some of the challenges could be tackled? How can the proposal be made more concrete?
- Using scenarios to test the investment proposals is a way to engage actors in a dialogue about future uncertainties which results in an active, critical understanding of the proposals, and therefore leads to co-ownership of these plans and will make it more likely that they are truly informed by regional perspectives.

The reviewing and revising of CSA investment proposals will be the core of the workshop. To do this, the scenarios and their associated quantitative results will be reviewed and adapted for the purpose of the meeting. A discussion of enabling policy conditions to CSA will serve to provide further insights into how CSA can be feasibly implemented.

Workshop outputs

- Improved CSA investment proposals supported by decision-makers and funders, proven to be feasible under diverse scenarios.
- Recommendations coming out of an analysis of what policy conditions must be established for CSA to be successful.
- Revised and improved scenarios, tailored to the Viet Nam context.
- A new network of participants able to take the development and implementation of CSA investment proposals and policy recommendations forward.

Workshop outline

Day 1	
9:00-10:00	Presenting the project, introducing participants
10:100-12:00 (with coffee break)	Mapping key indicators of policy interest for the focus region in Northern Vietnam: This exercise will focus on the scope of interest for the participants to help frame the workshop in a way that is guaranteed to be relevant too them.
12.00-13.00	<i>Lunch</i>

13.00 to 14.00	Presenting investment proposals: A first presentation and discussion on the investment proposals, and selecting indicators of interest related to the proposals and adding these to the workshop scope.
14.00-15.00	Presenting scenarios and associated model results: The regional scenarios and their associated model analyses (IMPACT/GLOBIOM, risk simulation and others) will be presented and discussed.
15.00-15.30	<i>Coffee break</i>
15.30-17.30	Adapting scenarios to key indicators of interest: The regional scenarios are translated to function as tailored decision contexts for the participants and the investment proposals. This is done by taking the list of key indicators of interest and outlining what a given scenario means for this indicator of interest over different time periods. The result is a tailored set of scenarios.
18:00-20:00	Welcome diner
Day 2	
9.00-10.30	Testing investment proposals against multiple adapted scenarios; develop recommendations for improving the proposals for a given scenario: The group splits up into breakout groups, each group testing the investment proposals against a different scenario, highlighting where the proposal is strong and where it has problems dealing with the scenario, and proposing recommendations to overcome these problems. <i>The group also considers what policy conditions may be created that would better enable CSA to be successfully implemented.</i>
10.30-11.00	<i>Coffee break</i>
11.00-12.30	Compare proposal feasibility across the different scenarios; compare recommendations for improvement: the groups come together to compare the strengths and weaknesses of the proposals in the context of different scenarios, and to compare which recommendations for improvement would increase the feasibility of the proposal across this range of futures. <i>Recommendations to create enabling policy conditions are also compared across scenarios.</i>
12.30-13.30	<i>Lunch</i>
13.30-15.30	Integrate recommendations for improvement into the proposal; summarize revised proposal's feasibility across the different scenarios; summarize policy recommendations
15.30-16.00	<i>Coffee break</i>
16.00-17.30	Next steps forward – funding and implementation