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Policy Manual: Policy Guidelines for Scaling up potential adaptation and mitigation measures

The three-year multidisciplinary ClimaViet project (July 2013 to June 2016) implemented jointly by the Vietnam Academy of Agricultural Sciences (VAAS) and the Norwegian Institute of Bioeconomy Research (NIBIO) is focusing mainly on the future impacts of climate change on rice production in Vietnam, with financial support from the Ministry of Foreign Affairs, Norway.

Key points

- **Vietnam** is one of the top five countries most affected by climate change
- **ClimaViet** project has tested key climate-smart strategies for sustainable rice production systems

General objectives

The main goal of the ClimaViet project is to identify and pilot test climate-smart rice farming systems that will contribute to improving rice production under changing climate, and at the same time help to mitigate greenhouse gas (GHG) emissions.

In particular, this manual outlines key policy recommendations for this project, including investment options for scaling-up selected adaptation measures.

Introduction

Vietnam has been identified as one of the top five countries most affected by climate change and, as a consequence, rice production is particularly vulnerable (IPCC, 2006). Although the alluvial soil in the Red River Delta and Mekong Delta can contribute to high rice yields, the frequent occurrence of floods, salinity and drought continues to threaten rice production in these regions (ISPONRE, 2009).

As a consequence, smallholder rice farmers in Vietnam face considerable risk, and require cropping systems that are more resilient to the negative impacts of drought and salinity.

Key points

- **Three provinces** were identified as highly vulnerable to climate change
- **Salt water intrusion and drought** are major constraints to rice production

Genotypes, management and the environment

Many different management systems are possible to combat drought and salinity (e.g. combinations of planting dates, fertilizers, irrigation, row spacing, population, cropping systems). Many different rice varieties are also possible.

The challenge is to identify favourable combinations of rice varieties and management practices in a complex system. Understanding the interaction between genotypes, management and the environment is critical to improving grain yield under dry and saline conditions. Policies that specifically target genetic and management solutions for adaptation to drought and salinity are recommended.

Policy options for scaling-up selected adaptation measures

Objective 1. *To identify and characterize rice farming systems that will be most vulnerable to climate change in the selected study areas due to changes in seasonality of rainfall (especially droughts and saline intrusion).*

Three provinces were identified as highly vulnerable to climate change in Vietnam: **Nam Dinh** province in the Red River Delta, and **Soc Trang** and **Tra Vinh** provinces in the Mekong River Delta.

Salt water intrusion is a major problem in Nam Dinh and Soc Trang provinces, and drought is a significant constraint to rice production in Tra Vinh.

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As a first step, the project analyzed the impacts on seasonality in rainfall leading to droughts and salinity in coastal areas. It then assessed the climate change impacts on rice production in the three provinces and the vulnerability farmers and women face.

Objective 2. *To identify and pilot test selected climate smart measures that will help in adaptation and mitigation, (improve rice production and at the same time reduce GHGs emissions).*

Seven key climate-smart measures for rice production were identified and tested:

- salinity-tolerant rice varieties,
- slow-release nitrogen fertilisers,
- alternative soil fertility management measures that reduce GHG emissions,
- climate-smart crop rotations,
- water-saving irrigation strategies,
- alternative fertiliser regimes to complement the water-saving technologies, and
- pest and disease forecasting measures.

Objective 3. *To assess the current and future institutional framework needed for implementing potential adaptation and mitigation measures tested in the project*

Salinity-tolerant rice varieties

Two key measures are needed. Firstly, the capacity to screen for higher salinity tolerance levels in rice and, secondly, the ability to make these varieties available to smallholder farmers at affordable prices. To achieve these measures, stakeholders will require: a) research capacity to screen large numbers of rice genotypes for salt tolerance; and b) seed production systems to be financed and monitored.

Key points

- **Seven key climate-smart measures** were identified and tested
- **Capacity** to screen salinity tolerant rice varieties is required

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Policies that support the breeding of saline tolerant rice varieties will need to be developed. These measures may be constrained by a lack of high throughput (HTP) screening methods for salt tolerance, together with a lack of finance to support HTP screening methods and seed research and development.

Slow-release nitrogen fertilisers

The key measure required is the availability of slow-release green and orange urea with higher nitrogen use efficiency (NUE) for smallholder farmers at affordable prices. To achieve this measure, stakeholders will require: a) research capacity to screen the response of key rice genotypes to N fertiliser in key target environments throughout Vietnam; and b) private companies to develop better slow-release fertilisers.

Key points

- **Slow-release N fertilisers** need to be available to smallholder farmers

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ClimaViet

Climate change and impacts on rice production in Vietnam:
Pilot testing of climate-smart agricultural measures

Key points

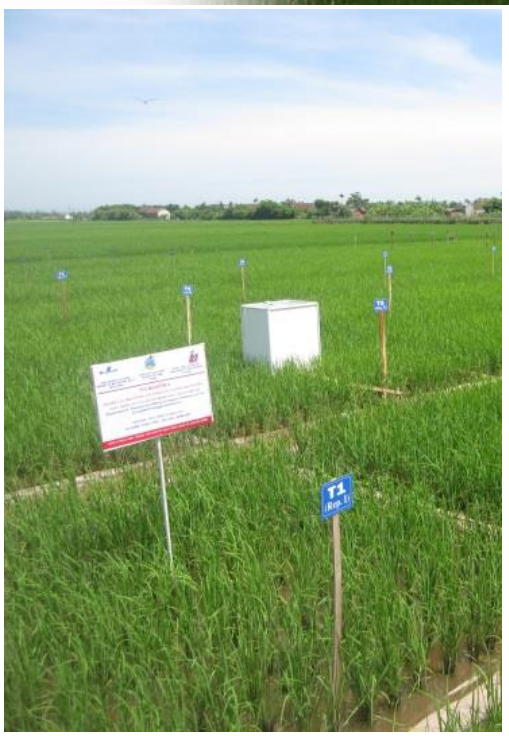
- **Efficient and cost-effective** methods of producing biochar from rice compost are required
- **Improved irrigation infrastructure** is required for climate-smart cropping systems
- **Water-saving irrigation** strategies are needed to combat drought

Policies will be required that evaluate slow-release fertilisers and encourage the private sector to invest in developing more efficient fertilisers. These measures may be constrained by a lack of available and/or affordable slow-release fertilisers for smallholder farmers, and there may not be enough incentives for the private sector to invest in this area.

Alternative soil fertility management measures that reduce GHG emissions

The key measures needed are efficient and cost-effective methods of producing biochar from rice compost. To achieve this measure, stakeholders will require a) research capacity to develop improved biochar production methods, and b) private companies to invest in these technologies.

Policies that evaluate biochar production methods and encourage the private sector to invest in developing more efficient biochar production systems are required. These measures may be constrained by a lack of available and/or affordable biochar production methods for smallholder farmers in Vietnam, and there may not be enough incentives for the private sector to invest in this area.



Climate-smart crop rotations

The key measures needed to implement such cropping systems are improved irrigation infrastructure and adequate maintenance of existing irrigation canals. To achieve these measures, stakeholders will need to a) improve the awareness of farmers regarding cropping system options, and b) provide economic data (e.g. commodity prices) to help farmers choose which cropping options are most viable.

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More investments will be needed to improve and maintain irrigation infrastructure.

Policies that enable irrigation infrastructure to be built and maintained and that ensure commodity prices are made available to farmers will be required. These measures may be constrained by the fact that farmers cannot benefit from improved rotations if irrigation infrastructure is limiting and cannot optimise returns without commodity price data.

Water-saving irrigation strategies

The key measures needed to implement the novel water-saving strategies are improved irrigation infrastructure and adequate maintenance of existing irrigation canals.

To achieve these measures, stakeholders will need to a) improve the awareness of farmers regarding these new water-saving strategies, b) improve skills of farmers to manage the water-saving technologies, and c) develop enhanced research capacity to further improve these systems. More investments will be needed to improve and maintain irrigation infrastructure.

Policies will be required that enable irrigation infrastructure to be built and maintained, and that support further research into water-saving strategies such as AWD. These measures may be constrained by the fact that farmers cannot benefit from novel water-saving strategies if irrigation infrastructure is limiting.

Alternative fertiliser regimes to complement the water-saving technologies

The key measures needed are the availability of alternative fertiliser regimes for smallholder farmers at affordable prices, and the maintenance of existing irrigation canals.

Key points

- **Alternative feritliser regimes** are required to complement water-saving technologies

To achieve these measures, stakeholders will need to a) improve the awareness of farmers regarding the alternative fertiliser regimes, b) improve the skills of farmers to manage new water-saving technologies, and c) develop enhanced research capacity to further improve fertilisers for alternate-wet-dry (AWD) systems. More investments will be needed to improve and maintain irrigation infrastructure.

Policies that enable irrigation infrastructure to be built and maintained, and that support further research into improved fertilisers for AWD will be required. These measures may be constrained by the fact that farmers cannot benefit from AWD if irrigation infrastructure is limiting, and cannot benefit from improved fertilisers if production of fertilisers is limited and if prices are too high.

Pest and disease forecasting models

The key measures needed are the training of local scientists in pest/disease forecasting models and the utilisation of these forecasts to better combat pest and disease outbreaks. To achieve these measures, stakeholders will need to a) ensure that local scientists with the right skill-sets are trained, and b) utilise the forecasts at a practical level to combat pests/diseases. Finance will be required to implement the forecasting strategy. **Policies that enable climate data to be accessed and pest/disease forecasting to be implemented at the provincial level will be required.** These measures may be constrained by a lack of on-going training for local scientists on pest/disease forecasting models.

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Key points

- **Pest and disease** forecasting models are needed to combat pest/disease outbreaks
- **Capacity of women** to adopt climate-smart farming practices will be enhanced
- **Genetic, management, economic and gender** strategies for scaling-up will be implemented

All of these policies will require public-private-partnerships (PPP) to be strengthened. 'Climate' finance will also need to be generated through private and public sources.

Objective 4. *To actively involve stakeholders, women and farmers in developing climate smart agriculture practices and improve awareness through dissemination of project results.*

From the very first stages of project development, stakeholders, women and farmers recommended ideas for pilot demonstrations. On this basis, selected measures were chosen and then pilot-tested for their potential adaptation and mitigation impacts in the three provinces, and their performance was validated in cooperation with local agencies, women and farmers.

The project emphasized gender wherever relevant and actively involved stakeholders at the provincial and national level from the beginning. This was demonstrated by the presence and interaction of stakeholders at project meetings and workshops. Several female researchers and women farmers were actively involved and trained during the project and field experimentation.

Conclusions for scaling-up

There are a number of key conclusions for scaling-up in the areas of genetics, management, economics and gender.

Genetics
Enhance research capacity and funding (public and private sector) to develop drought and salt tolerant rice varieties.

Management
Enhance research capacity and funding (public and private sector) to develop slow-release N fertilisers and biochar products that are affordable to farmers.

Improve and maintain irrigation infrastructure to enable water-saving technologies (AWD) and more flexible cropping systems.

Implement a pest/disease forecasting systems for the selected pests and diseases in rice and recommend integrated management measures.

Economics
Provide agricultural commodity price data to farmers. Increase profitability of rice-based farming systems for smallholder farmers.

Gender
Enhance the capacity of women to adopt climate-smart farming practices.

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