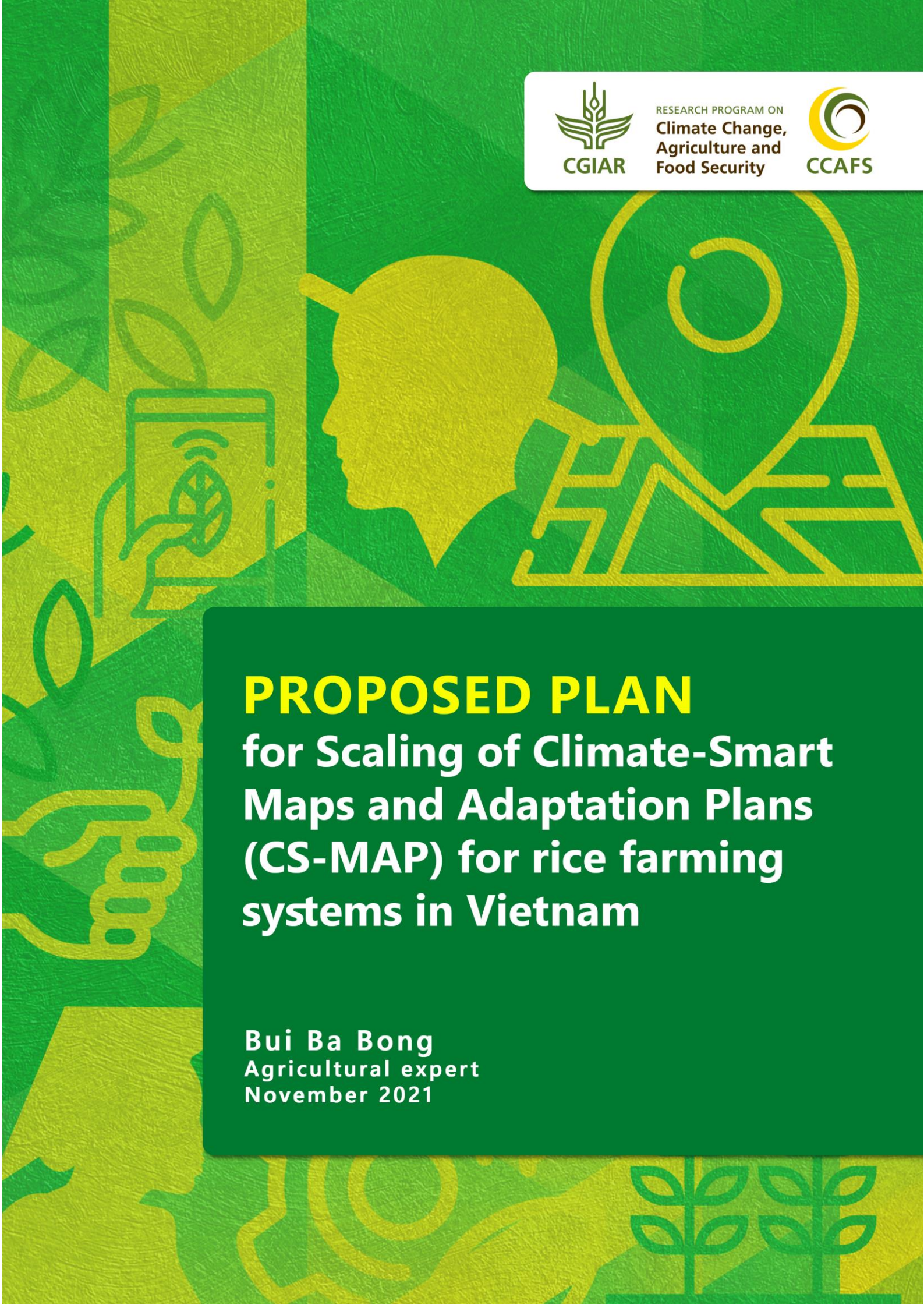

PROPOSED PLAN

for Scaling of Climate-Smart Maps and Adaptation Plans (CS-MAP) for rice farming systems in Vietnam

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November 2021

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Climate change has been causing and will continue to cause negative impacts on rice production on a large scale in Vietnam, due to increased salinity intrusion, droughts, flooding, heatwaves and other extreme weather types. The tendency of these impacts becoming more and more serious poses a great challenge to sustainable development of the rice sector, which serves as the core of national food security towards the goal of "enhancing land use efficiency, maintaining 3.5 million hectares for rice cultivation, producing an annual total of 35 million tons of rice, serving as the core of ensuring national food security, and meeting the demands of consumption, processing, storage and exporting" identified by the Government in Resolution No. 34/NQ-CP on 25 March 2021 on ensuring national food security by 2030. To achieve this goal, the challenges of climate change in rice production in Vietnam must be overcome through the application of solutions to enhance the resilience of rice farming systems.

Within the above-mentioned context, the Ministry of Agriculture and Rural Development (MARD) collaborated with CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) in South East Asia and the International Rice Research Institute (IRRI) to pilot climate-related risk mapping and adaptation planning for rice farming systems, CS-MAP in short, with the goal of strengthening the resilience of rice production systems to locally specific climate-related risks. CS-MAP pilots were implemented on a large scale at provincial, district and commune levels in different ecological regions including the Mekong River Delta, Red River Delta and Northern Midlands, South Central Coast and Central Highlands from 2006 to 2020.

Results of the pilots show that the application of CS-MAP methodology was effective in helping local levels develop and implement rice production plans based on their local climate risk maps for smart adaptation, in turn limiting damage caused by climate change in rice production, and at the same time improving the efficiency of the use of natural resources and promoting local knowledge and experience. The CS-MAP Initiative has been recognized by MARD as one of the initiatives and scientific research projects that have the scope of influence and effects at the ministry levels in the Minister's Decision No. 2559/QĐ-BNN-TCCB dated 7/7/2020. Up to now, based on the actual implementation of the pilots in various provinces, districts and communes, the process of risk mapping and adaptation planning has largely been completed, with detailed instructions provided in the "Guidebook on the Development of Climate-Smart Maps and Adaptation Plans (CS-MAP) for Rice Production in Viet Nam" developed and published by the National Department of Crop Production (NDCP) in collaboration with CCAFS and IRRI.

Building on the results achieved by the actual application of CS-MAP in 41 provinces and the pilots in a number of districts and communes, there is a need for scaling CS-MAP in rice production to all provinces of Vietnam and a higher level of specificity at the district and commune levels, to cater to their respective local climate change context and ecological conditions.

1. Advantages, challenges and local governments' needs of the scaling of CS-MAP

The NDCP carried out a survey in October 2021 to explore the advantages, challenges and needs of the local governments (at provincial, district and commune levels) of the scaling of CS-MAP. See Appendix 1 for the detailed survey results.

Advantages

The localities are interested in developing their agricultural production and have already been carrying out agriculture support policies within their areas, including climate change adaptation, natural disaster prevention and control, and application of scientific and technological advances in agriculture. Restructuring agriculture towards sustainability and efficiency is being considered a focal task in agricultural development in these localities.

The local authorities have had a number of existing resources in place including secondary data, baseline maps, hydro-meteorological data, and have been receiving hydro-meteorological forecasts for informed direction of local agricultural production.

There are available technical human resources to meet the needs of CS-MAP implementation, and the agricultural extension workforce is qualified and capable of transferring scientific and technological advances and undertaking the role of providing training to agricultural officers and farmers. Within the agricultural sector, a system of technical units already exists from the provincial to the district level.

Communication systems of agricultural production directions at the local levels has been developed and improved with experience. Agricultural solutions have been communicated thoroughly from the provincial level down to district and commune levels.

The agricultural development infrastructure has been and is being invested, especially in relation to irrigation, contributing to the establishment of rice producing areas well adapted to local water resources and ecological conditions.

Challenges

The technical human resources at the provincial level are still lacking in quantity for the management and guidance of large-scaled CS-MAP application; there is insufficient regular staff specialized in monitoring, adjusting and updating CS-MAP on an annual basis and in the long run.

The information technology (IT) infrastructure of the units within the agricultural sector is still not well prepared, especially at the district and commune levels. A hydro-meteorological observation and data system exclusively for the district level is currently not available.

Available scientific advances have not fully addressed the needs of agricultural production, for example regarding rice varieties resilient to salinity intrusion, droughts, or fragrant rice varieties etc., to be applied in the adaptation plants.

There is a lack of funding for the scaling and sustaining CS-MAP in the long term.

Needs of local governments

Training and allocation human resources suitable for the CS-MAP goals and methodology to the local levels, and at the same time human resource support from the central level based on specific activities.

Improve IT infrastructure of agricultural agencies and units at local levels, addressing the needs of basic facilities for CS-MAP application, especially at the district and commune levels. Invest in upgrading and developing agricultural production infrastructure, especially in relation to irrigation, transportation, and farm designing. Develop a hydro-meteorological observation system at the district level.

Develop production – sales of products linkages: Establish and develop production – sales of products chains for agricultural and aquatic products in local areas, with CS-MAP application.

Funding to be allocated to the local levels for the scaling and annual maintenance and updating of CS-MAP, and surveying and collection of data related to local rice production of each season with CS-MAP application.

Develop collaboration mechanisms among agricultural sector and other sectors at the local levels (departments of finance, natural resources, science and technology, Farmers' Union etc.)

2. CS-MAP Scaling Plan

2.1. Objectives, activities and the scope of CS-MAP scaling

Objectives

Expand the scale of CS-MAP application to improve national rice production's resilience to climate change and extreme weather events, moving towards sustainable rice production, and contributing to the national food security. The results of CS-MAP integrated into agricultural production systems will also contribute to climate-related and natural disaster risk forecasting and prevention, effective regulation and utilization of resources for agricultural production and development of digital technologies in agriculture.

Activities

In order to scale CS-MAP application, we need to develop CS-MAP for each level, including climate risk mapping and adaptation planning for normal and extreme climate change scenarios. The steps in developing CS-MAP shall be based on the ""Guidebook for the Development of Climate-Smart Maps and Adaptation Plans (CS-MAP) for Rice Production in Viet Nam" compiled and published by the NDCP in collaboration with CCAFS and IRRI.

The next step is to apply CS-MAP in rice sector restructuring plans and local seasonal and annual rice production plans. During the course of application, CS-MAP will be constantly reviewed, updated, adjusted and improved every year.

During the mentioned-above process, the CS-MAP development steps require great efforts due to the high requirements of technical and financial capacity, especially at the district and commune levels. On the other hand, the application of adaptation measures in production enjoys various advantages thanks to the local leadership and agricultural extension systems already in place.

Scope

CS-MAP will be developed nationally for the provinces, districts and communes whose rice farming areas make up 30% or more of the total area of crop growing land. The collaboration among the provinces will be reflected in regional and sub-regional CS-MAP.

2.2. Measures to scale CS-MAP development and application

2.2.1. Integration of CS-MAP development and application in socio-economic development policies, master plans and planning

CS-MAP's position in climate change adaptation policy framework

Climate Smart Agriculture (CSA) as defined by FAO is an approach that helps guide actions to transform agricultural systems and ensure food security under the new realities of climate change. It aims to tackle three main objectives: (i) sustainably increasing agricultural productivity and incomes; (ii) adapting and building resilience to climate change; and (iii) reducing and/or removing greenhouse gas emissions, where possible. As such, CS-MAP meets all the criteria of CSA and is considered one CSA activity to be integrated into climate change adaptation policy framework. Currently, in the world as well as in Vietnam, CSA is generating a lot of interest and being developed as a pillar in transforming agri-food systems. Thus, CS-MAP can be considered a base for expanding the integration of CSA adaptation and mitigation solutions, and thanks to this, the integration of CS-MAP into climate change adaptation policies and planning at different levels is highly feasible, bridged by the integration of CSA.

Integrating CS-MAP into national and ministerial policies and planning

CS-MAP objectives and activities in rice production in Vietnam has been directly or indirectly mentioned in the latest national climate change policies and plans, including the following:

The National Green Growth Strategy for the period 2021-2030 with a vision to 2050, approved by the Prime Minister (PM) at Decision No. 1658/QĐ-TTg on 01 October 2021.

Vietnam's Updated Nationally Determined Contribution (NDC) was approved by the PM on 24 July 2020, and the National Climate Change Adaptation Plan for the period 2021-2030 with a vision to 2050, approved by the PM at Decision No. 1055/QĐ-TTg on 20 July 2020. The National Climate Change Adaptation Plan sets out strategic tasks of climate change adaptation to realize the NDC commitments in the NDC both in the midterm and long-term.

Vietnam's National Strategy on Climate Change to 2050 and National Climate Change Adaptation Plan for the period 2021-2030 are in the process of drafting and expected to be officially released in the coming months (replacing the National Strategy on Climate Change approved by the PM at Decision No. 2139/QD-TTg on 05/12/2011 and National Climate Change Adaptation Plan for the period 2012-2020 approved by the PM at Decision No. 1474/QD-TTg on 05/10/2012).

According to the **National Green Growth Strategy** (Decision No. 1658), the agricultural sector's strategic aims include "Developing modern, clean, organic and sustainable agriculture; raising the quality, the added value and the competitiveness of agricultural production through adjustments and shifts in the composition of livestock, crops, forestry and aquaculture production, as well as through the application of procedures and technologies that enable the thrifty and efficient use of breeds, species, feed, agricultural supplies and natural resources…; accelerating the progress of projects involving afforestation, reforestation and the sustainable development of forestry activities." In realizing this aim, MARD has been assigned with 4 tasks, of which the first is to "Develop and fulfill the tasks of developing efficient, sustainable and low emission agricultural commodity production with a direction towards a circular economy that is climate smart."

In Vietnam's 2020 **Updated Nationally Determined Contribution (NDC)**, contributions related to climate change adaptation in agriculture include: shifting production towards climate-smart and environmentally friendly production; changing the production structure and varieties of plants and animals, adjusting cultivation calendars, agricultural production techniques towards climate-resilience. As such, the application of CS-MAP approach meets the needs of contributions to climate change adaptation, and additionally, to reducing greenhouse gas (GHG) emissions caused by the conversion of wet rice farming areas which adapt poorly to climate change into dry farming or aquaculture areas.

The **National Climate Change Adaptation Plan** (Decision No. 1055) identifies the overall goal as reducing vulnerability and risks from climate change impacts through strengthening resilience and adaptation capacity of communities, economic sectors and ecosystems; promoting the integration of climate change adaptation contents into relevant strategies and planning. In the crop production sector, the specific tasks related to rice production include (i) Apply and develop integrated farming models (rice – shrimp, rice – fish, rice – duck, rice and use of its by-products as fertilizers or for energy production) that are adaptable to climate change in rice land ecosystems, and (ii) Assess the effectiveness of rice land and convert ineffective rice land into land for fruit trees, crops, or combined farming models (rice – aquaculture, rice – crops, fruit trees or fodder plants) which have highly economic efficiency and suitable for each ecological region.

CS-MAP's goals are highly suited to be integrated into existing policies directly related to rice production such as the Government's Decree No. 35/2015/NĐ-CP on 13/4/2015 on the **management and use of land for rice cultivation**, and Decree No. 62/2019/NĐ-CP on 11/7/2019 on **Amending and supplementing a number of articles of the Government's Decree No. 35/2015/NĐ-CP** on 13/4/2015 on the management and utilization of land for rice cultivation. Decree 35 specifies that rice producing localities are entitled to supports from the State budget based on areas of rice-farming (1,000,000vnd/ha/year for wet rice farming land, and 500,000vnd/ha/year for other rice farming land), and according to Decree 62, at least 50% of the funds to support rice growers shall be used for the application of new varieties, technical advances, new technologies in rice production as well as promote connectivity between rice production and consumption of produce.

The Prime Minister approved the **Agricultural Restructuring Plan for the period of 2021-2025** at Decision No. 255/QĐ-TTg on 25/02/2021. According to this Decision, rice continues to be identified as a national key product and the orientation for crop production related to rice is "effective management and use rice farming land, flexible conversion between cereal crops and other agronomic crops; restructure crop production towards reducing the share of cereal output to about 35%". The Decision establishes "Protection natural resources and rural environment, improving resilience to climate change and preventing and combating natural disasters" as one of the solutions to implement the Plan.

Regarding climate change policies and plans promulgated by MARD, the latest is the **Plan for the Implementation of Paris Agreement on climate change** for period 2021-2030, approved by the Minister at Decision No. 891/QĐ-BNN-KHCN dated 17/3/2020. Following this decision, it can be seen that CS-MAP can be integrated in the obligatory tasks of reducing GHG emissions, which include (i) converting inefficient rice farming land into efficient dry farming land; (ii) converting double rice crop model to 1 rice – 1 shrimp crop model, and (iii) Integrated Crop Management (ICM) in rice cultivation, and the prioritized tasks of climate change adaptation which include (i) appropriate and efficient use of land for rice farming, and

(ii) Rice production solutions which are adaptive to natural disasters and climate change, with high quality and added value for domestic consumption and exporting.

CS map can be directly integrated into the **Scheme for Restructuring of Vietnam's Rice Industry** by 2025 and 2030 approved by the Minister of Agriculture and Rural Development at Decision No. 555/QĐ-BNN-TT on 26 January 2021. According to this document, "Complete saltwater intrusion, drought and flooding warning maps for key rice production regions, which will provide the basis for flexible changes to planting seasons and technical solutions for sustainable rice cultivation" is identified as one of the solutions for the implementation of the scheme. As planned by MARD, the Scheme for Restructuring of Vietnam's Rice Industry by 2030 will be approved by the Prime Minister in 2020.

For the Mekong River Delta (MRD), the development of CSA aligns with the viewpoints of "respecting law of nature, avoid harsh intervention in nature, selecting nature- and environment-friendly adaptation models, and sustainable development under the motto of living together with floods, saline water; researching and developing scenarios with effective adaptation solutions to natural disasters such as typhoons, floods, droughts, and salinity inclusion, and to the most severe scenarios caused by climate change and Mekong River upstream development impacts" stated in the Government's **Resolution No. 120/NQ-CP dated 17/11/ 2017 on Sustainable and Climate Resilient Development of the Mekong River Delta**.

In the spirit of Resolution No. 120, the PM approved the **Master Program on Sustainable and Climate Resilient Agricultural Development of the Mekong River Delta** to 2030, with a vision to 2045 at Decision No. 324/QĐ-TTg on 02/03/2030. Following contents of this Decision, the application of CS MAP in MRD provinces can be directly integrated into the rice industry's programs, including the livelihood support program for triple-rice cropping farmers to change their farming models in the period of 2020-2030.

Integrating CS-MAP into local-level policies and planning

Identify CS-MAP as a climate change adaptation and natural disaster prevention and control solution to be integrated into Socio-economic Development Plans, 2021-2030 Climate Change Adaptation Action Plans, and the Agricultural Land Use Master Plans (including conversion of rice farming land) at the local levels. Presently, most of the provinces have approved the promulgation of Climate Change Adaptation Action Plans for the period of 2021-2030, with a focus on climate smart solutions in agriculture. Moreover, CS-MAP can also be integrated into provincial agricultural sector's plans, programs, schemes and projects such as provincial Agricultural Development Plans 2021-2025, Agriculture Restructuring Scheme, Sustainable and Climate Resilient Agricultural Development Scheme, CSA projects, agricultural extension programs, international projects in the provinces etc.

Examples of promulgated provincial policies and plans which prove CS MAP compatible to be integrated into their implementation in the provinces can be found at Appendix 2.

For provincial climate change adaptation action plans and provincial agricultural programs, schemes and projects that have components related to CSA application, CS-MAP can be integrated into the implementation at the district level. Districts' proactive integration of climate change adaptation into their socio-economic development plans and agricultural development plans needs to be strengthened, first and foremost with regards to awareness,

because the majority of the districts tend to be more interested in structural solutions than technological innovation solutions in their climate change adaptation plans.

At the commune level, the integration of climate adaptation measures such as CS-MAP into commune-level plans needs to be included into the district level's policy, because the communes develop plans based on the targets assigned by the districts. However, there is a high probability for commune level to integrate CS-MAP into policies that support farmers and communities to increase resilience to climate change in international organization, NGO and ODA funded projects.

2.2.2. State management measures

Funding mechanisms for CS-MAP scaling

Regarding funding sources for Scaling CS-MAP, in addition to local allocated budgets in approved plans, master plans, programs, schemes and projects for climate change adaptation activities where CS-MAP can be integrated, the localities can also make use of the direct central budget supports such as stipulated in Decrees 35 and 62 on the management and use of land for rice cultivation, or from the budget for the integration of natural disaster prevention and control into local agricultural and socio-economic development master plans and plans (an guidance Circular is to be issued by the Ministry of Planning and Investment in the near future), budget allocations from the Agricultural sector's plans, schemes and projects through MARD, and funding from relevant international and ODI projects in the areas.

Funding support for the training of local offices and farmers can come from local agricultural extension budgets.

Mobilize the private sector's contribution for investment in production transformation on rice farming land, linking production and sales of products, or through agricultural insurance companies. Take advantage of post-investment support from agricultural infrastructure development projects, especially irrigation, for restructuring of production (including rice) that serve the projects' goals.

Human resources for CS-MAP scaling

At the provincial level, the human resouces for CS-MAP scaling will include mainly provincial DARDs and their sub-departments and centers. As required, MARD's state administrative units and institute leaders can provide technical assistance to provincial DARDs in CS-MAPping and adaptation planning.

At the district level, the human resources will include mainly district DARDs with technical assistance from provincial DARDs. At the commune level, agricultural activities are usually directed by commune officers in charge of agriculture, whose roles are in most cases undertaken by the Commune People's Committee Vice Chairmen and Commune Agricultural Committee members as part of their work.

Collaboration mechanisms

The development of maps and plans requires collaboration between provinces within each region, the districts within each province, and the communes within each district, to avoid conflicts in the use of natural resources as well as facilitating cooperation, support and sharing in the use of natural resources, infrastructure, production linkages, market linkages etc.

The National Department of Crop Production is to lead the collaboration among the provinces within each ecological region; the provincial DARD is to lead the collaboration among the districts within the province, and the district DARD is to lead the collaboration among the communes within the district.

Scaling Timeline

For provinces which have developed and applied CS-MAP at the provincial level: Continue to apply CS-MAP in restructuring the rice sector and directing rice production at the provincial level, with updates and improvements in the process, and developing and applying CS-MAP in all districts by 2022 and all communes by 2023.

For provinces which are starting to apply CS-MAP: Complete the development and application of CS-MAP at the provincial level by 2022, and the district and commune levels by 2023.

Monitoring and Evaluation mechanisms

The monitoring and evaluation of CS my application serves to assess the extent to which the objectives of the adaptation plans are met, identify any barriers and limitations during implementation, and are carried out seasonally and annually at each level. M&E activities are based on three objectives including (i) productivity, ensuring food and income security; (ii) adaptability achieved: the reduction of damage thanks to reducing or avoiding weather risks identified and shown on the maps, and adaptation solutions applied; (iii) climate change mitigation achieved through appropriate and economical use of resources, shifts of crop structure on rice farming land, and mitigation solutions integrated in rice production. Furthermore, additional evaluation can be done in terms of sustainability, the level of integration of other climate smart solutions, local implementation capacity and the roles of local communities.

M&E results are one component of regular CS-MAP implementation progress reports by the local levels. The monitoring and evaluation of CS-MAP scaling (provincial and regional levels) will be carried out by provincial DARDs in collaboration with the NDCP every 2-3-year period.

Responsibilities of relevant agencies

Agencies under MARD

The NDCP is MARD's leading agency in implementing CS-MAP scaling plan in rice production on the national level, and has the responsibility to collaborate with the Science, Technology and Environment Department and Planning Department to propose CS MAP integration in plans, programs and schemes approved by MARD, and collaborate with the General and National departments and National Agricultural Extension Center to direct the implementation at the local levels. The NDCP is to directly develop and direct the application of CS MAP in rice farming systems in the ecological regions.

Provincial DARDs

Organize the guidance, management, following-up, monitoring, evaluation and reporting of climate change integration into the development, approval and implementation of strategies, master plans and plans, schemes and projects according to their assigned functions and responsibilities.

Advise the Provincial People's Committee (PPC) to integrate CS- MAP into CSA development in provincial socio-economic and agricultural developments master plans and plans, and integrate CS-MAP into programs and schemes that the provincial DARD directly approve.

Direct the application of CS-MAP throughout the province, and regularly report its implementation progress to MARD.

Establish a DARD's Steering Committee for CS-MAP application headed by a DARD leader.

3. Conclusions and Recommendations

3.1. Conclusions

CS-MAP for rice cultivation has been developed and applied in 41 provinces and resulted in high effectiveness and successful pilots at district and commune levels.

CS-MAP meets the requirements for scaling: necessity, effectiveness, feasibility, and compatibility with other technology platforms.

The challenges in scaling SCMAP at the local levels in terms of funding and human resources can be resolved through active policy integration and implementation of training and technological exchange programs for local officers and farmers.

3.2. Recommendations

Recommendations to MARD

Develop policies for scaling CS-MAP all over Vietnam (through promulgation of Directives) to provide the legal basis for implementation at the local levels.

Develop policies for scaling CS-MAP to other agricultural systems such as fruit trees (two pilots have been carried out in 2 provinces), coffee, shrimp-rice farming systems in the MRD etc.

Building on CS-MAP, further integrate climate change adaptation and mitigation solutions and use of soil, water and biodiversity resources, and improve product value chains' resilience, approaching all the CSA's objectives.

Continue to mobilize international support for scaling CS-MAP in rice production systems and a number of other agricultural areas.

Recommendations to provincial DARDs

Take initiatives to develop and apply CS-MAP through integration into provincial Agricultural plans, schemes and projects, and advising provincial People's Committees to integrate CS-MAP into their policies, master plans and plans; make use of the budget supports for rice cultivation for the implementation of CS-MAP.

Appendix 1. Advantages, challenges and local needs for scaling CS-MAP (Survey by the NDCP, October 2021)

An Giang province	**Provincial level**	**District level**	**Commune level**
Advantages	- Some experience with CS-MAP - Local leaderships' interest.	Relatively good technical capacity; good understanding of the district's actual situation.	Deep understanding of local conditions and needs for development.
Challenges	Insufficient human resources (quantity) for scaling.	- Lack of human resources and facilities for implementation. - Incomplete infrastructure.	Insufficient facilities and capacity for reading and thoroughly understanding the maps.
Needs	- Human resources, markets. - Human resource and facility support for using and developing CS-MAP.	- Information infrastructure, human resources, markets and finance. - Investments in infrastructure, facilities and human resources.	Information infrastructure, human resources, markets, finance and agricultural extension infrastructure
Bạc Liêu province	**Provincial level**	**District level**	**Commune level**
Advantages	- Production is divided into different areas (saline water, fresh water) in the master plan. - Proactive in developing crop calendars for rice, vegetables and aquaculture. - Having a system of canals to separate saline and fresh water. - Irrigation systems are being developed and improved. - Good operation of Ninh Quoi lock canal in regulating water for agriculture. - Qualified agricultural extension workforce, capable of meeting training and technological transfer needs.	- Appropriate annual planning of rice, vegetable and aquaculture crops within their areas. - Enclosed embankment systems, with pumping stations for active irrigation. - Effective operation of canals and salt water prevention dams. - Qualified agricultural extension workforce, capable of meeting training and technological transfer needs.	- Complete on-farm irrigation structures. - Temporary salt water prevention dams and pumps for freshwater storage when needed.
Challenges	- Regulating freshwater for rice and vegetables, and saline water for shrimp farming.	- Regulating freshwater for rice and vegetables, and saline water for shrimp farming.	- Insufficient qualified and capable human resources for CS-MAP application and transferring.

	- Insufficient qualified and capable human resources for CS-MAP application and transferring. - Inadequate supply of high-quality rice and fragrant rice varieties that are resilient to droughts and salinity intrusion to meet farmers' needs.	- Insufficient qualified and capable human resources for CS-MAP application and transferring. - Inadequate supply of high-quality rice and fragrant rice varieties that are resilient to droughts and salinity intrusion to meet farmers' needs.	- Lack of funding for building temporary dams for the winter-spring season.
Needs	- Invest in building new and renovating and upgrading existing salt water prevention canals under provincial management. - Develop production - sales linkages for agricultural and aquaculture products - Not planting rice in winter-spring season in areas far from freshwater sources in Gia Rai town, areas near the canal ends along Highway 1A, or areas adjacent to shrimp-farming areas.	- Invest in renovating and upgrading existing salt water prevention canals under district management. - Plan to implement production - sales linkages for agricultural and aquaculture products - Develop plans of crop conversion or construction of irrigation works to ensure sufficient water supply for production.	Invest in building salt water prevention canals along rural road systems.
Cần Thơ City	**Provincial level**	**District level**	**Commune level**
Advantages	- Secondary data available - Demand for technology-based management.	- Secondary data available - Demand for technology-based management.	- Secondary data available
Challenges	- Insufficient infrastructure. - Lack of human technology savvy resources. - Lack of investments for long term and sustainable technological application.	- Insufficient infrastructure. - Lack of human technology savvy resources. - Lack of investments for long term and sustainable technological application.	- Insufficient infrastructure. - Lack of human technology savvy resources. - Lack of investments for long term and sustainable technological application.
Needs	- Investments in technological facilities. - Training and building of tech-savvy human resources, with legacy.	- Investments in technological facilities. - Training and building of tech-savvy human resources, with legacy.	- Investments in technological facilities. - Training and building of tech-savvy human resources, with legacy.

	- Communication to cooperatives, farmers and political systems. - Annual and stable funding for technical management in each field.	- Communication to cooperatives, farmers and political systems. - Annual and stable funding for technical management in each field.	- Communication to cooperatives, farmers and political systems. - Annual and stable funding for technical management in each field.
Kiên Giang Province	**Provincial level**	**District level**	**Commune level**
Advantages	- Sufficient existing infrastructure for CS-MAP implementation. - Sufficient baseline data and information and CS maps, meteorological data.	Sufficient infrastructure and human resources for CS-MAP implementation.	Sufficient infrastructure and human resources for CS-MAP implementation.
Challenges	Lack of full-time specialists due to Government's downsizing policy.	Lack of full-time specialists due to Government's downsizing policy.	Lack of full-time specialists due to Government's downsizing policy.
Needs	Need to collaborate with the provincial Department of Information and Communication for synchronized integration and regular broadcasting on local TV and radio stations.	Provide information, receive products, and integrate into directions, communication and dissemination in the areas under various forms and channels.	Provide information, receive products, and integrate into directions, communication and dissemination in the areas under various forms and channels.
Sóc Trăng province	**Provincial level**	**District level**	**Commune level**
Advantages	- Received support to develop salinity intrusion risk maps which serve as basis for production advisories for normal and extreme years. - Regularly receive climate and water resource forecasts. - Existing state management system of production from provincial to district and commune levels.	- Received support to develop salinity intrusion risk maps which serve as basis for production advisories for normal and extreme years. - Receive seasonal climate and water resource forecasts and advisories for crop calendars from provincial Agricultural departments. - Existing state management system of production from district and commune levels.	- Receive seasonal climate and water resource forecasts and advisories for crop calendars from district Agricultural departments. Based on that, CPCs develop planting plans and calendars for each village and communicate the information to farmers. - Existing system of commune officers overseeing local production situation.
Challenges	- Climate change causes different impacts each year and does not follow any pattern. Therefore,	- Climate change causes different impacts each year and does not follow any pattern. Therefore,	- The communes have not been supported in developing salinity intrusion risk maps to

	risk maps can't be fully applied for developing crop calendars; the application can only be done in parts and in some suitable areas. - The provision of climate and water resource forecasts is still too slow for the province's production planning. - The province still lacks human resources and facilities for annual adjusting and updating of maps.	risk maps can't be fully applied for developing crop calendars; the application can only be done in parts and in some suitable areas. - Some communes lack human resources; challenges in following up with production. - The districts lack human resources and facilities for annual adjusting and updating of maps	serve as basis for crop calendar advisories for normal years and extreme years. - Limited climate and water resource forecasts. - Due to some challenges in transportation in some areas, some farmers have not been able to fully access climate change information and crop calendars for their home farm planning.
Needs	- Training and facility support to the province to adjust and update the maps each year and to store the database. - Support the integration of data on planting progress and rice production phases into the maps. - Support for smart pest & disease monitoring pilots for management and warning of pests and diseases. - Support the integration of data on planting progress and rice production phases into the maps. The province to arrange human resources to collect weekly data on planting areas and rice production phases.	- Training and facility support to the districts to adjust and update the maps each year and to store the database. - Support the integration of data on planting progress and rice production phases into the maps - Timely communication of climate change information. - Support the integration of data on planting progress and rice production phases into the maps. The districts to arrange human resources to collect weekly data on planting areas and rice production phases.	- Support the communes to develop salinity intrusion risk maps to serve as basis for crop calendar advisories for normal years and extreme years - Support for facilities (salinity meters, mobile loudspeakers, panels for public posters) - Funding support for local full-time staff (commune, village levels) - Timely communication of climate change information and weather forecasts for each crop and season. -Once supported with crop calendar information, the communes will arrange human resources to transfer the instructions to farmers, through training activities integrated into regular meetings of Farmers' Union, Veterans' Union, Women Union, Youth Union, farmer groups, Cooperatives etc.
Bến Tre province	**Provincial level**	**District level**	**Commune level**

Advantages	- Many existing production support policies. - Devoted staff - Technical agencies evenly distributed across the districts.		
Challenges	-Climate change impacts regarding pest and disease pressures tend to increase every year. - Sometimes weather and climate information lacks accuracy. Droughts and salinity intrusion greatly impact every year's planting schedules. -Incomplete irrigation system.		
Needs	- Improve rural and on-farm road system to facilitate agricultural product transportation. - Training of human resources to adapt to new situation. - Strengthen extension activities, science and technology transferring, market linkages, advertising and commercial promotion.		
Long An province	**Provincial level**	**District level**	**Commune level**
Advantages	- Thanks to NDCP's and the Program's support, CS-Map started early in the province. - Has applied CS-MAP in direction production, to reduce damage caused by natural disasters, droughts and salinity intrusion.	- District officers participate actively in experience sharing. - Have applied CS-MAP in direction production, to reduce damage caused by natural disasters in vulnerable areas.	Commune officers participate actively in experience sharing.
Challenges	Inadequate human resources; existing computers have low processing capacity, unable to meet the program's requirements.	- Inadequate human resources; existing computers have low processing capacity, unable to meet the program's requirements. - Staff that receive technical training are	- Inadequate human resources; existing computers have low processing capacity, unable to meet the program's requirements.

		often assigned to other positions.	- Commune officers are often overloaded with multiple tasks.
Needs	Provide computers with stronger processing capacity to apply CS-MAP.	Provide districts towns and cities with computers with stronger processing capacity to apply CS-MAP.	