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Factsheet Resilience Solutions for the Rice Sector in Vietnam

This Factsheet is a part of the Private Markets for Climate Resilience (PMCR) project to evaluate systematically the potential market for climate resilience solutions in the private sector. Focusing on agriculture and transportation, current practices and opportunities highlight products, services and finance in six emerging markets — Colombia, the Philippines, South Africa, Nicaragua, Kenya, and Vietnam.

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Rice sector in Vietnam

Rice production has a key role in the economic and social development of the country. According to the International Rice Research Institute (IRRI), rice production accounts for 82% of the country's cultivated land area. Since 1993, Vietnam has been a major exporter of rice in the world. Vietnam's rice production and export growth has been largely based on exports through bilateral contracts with governments in Asia, Africa and the Middle East at competitively low prices.

Vietnam's main rice varieties are short duration aromatic varieties, short duration standard varieties and medium duration varieties. At present, rice production in Vietnam is facing many challenges. Small-scale rice farmers often lack the appropriate cultivation techniques to produce high quality rice. In addition, Vietnamese rice is often considered lower quality compared with other competitors in the world market. A lack of organisation among small-scale producers has consequently weakened the country's position, making it highly vulnerable in the global rice value chain. Rice in Vietnam is still produced using many methods that have negative impacts on people and the environment. Rice is one of the main contributors to the large amount of methane that contributes to climate change.

Vietnam's commercial rice production is mainly grown in the Mekong River Delta (MRD), where transportation is difficult due to the many channels, canals and rivers. Rice farmers are therefore dependent on traders as they have large-scale means to collect rice and transport it to milling and processing plants. Naturally, the collector's rice trade is monopolistic and it is difficult for farmers to negotiate prices. In addition, farmers are dependent on traders for the supply of agricultural materials.

Climate change is significantly affecting the rice sector in Vietnam. Due to the importance of the sector to the economy, expected losses due to climate change can be immense with far-reaching consequences. While the economic impacts of climate change at the household level are well known, due to significant knowledge gaps, these are not currently quantified. Hence, the sector is well-positioned to deliver positive returns on investments made into resilience solutions.

Sector facts (2017-2018)

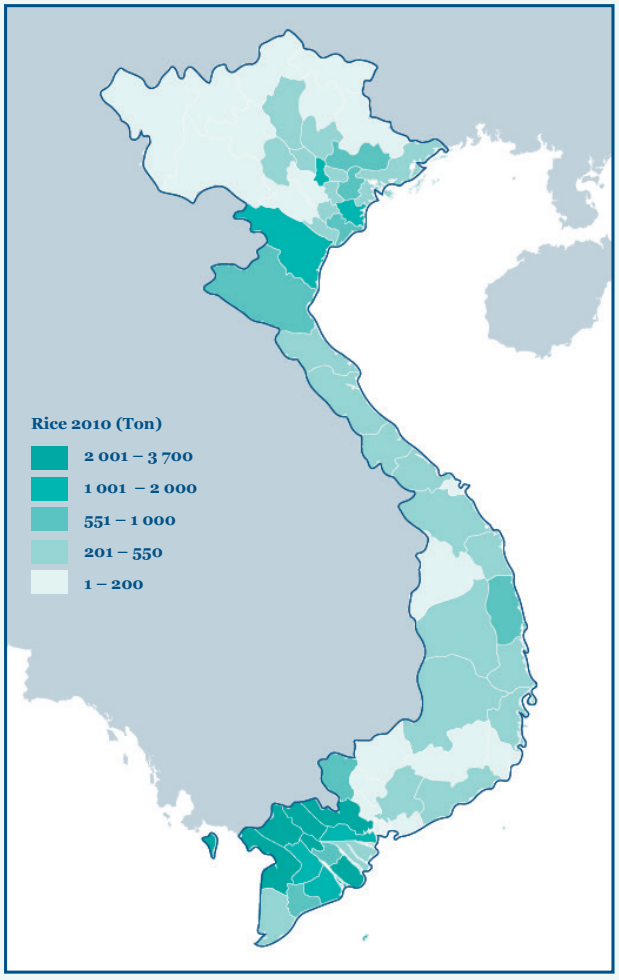
Total production: In 2017-18, Vietnam's rice output reached 28 million tonnes. The volume exported in 2017/18 was estimated at 6.7 million tonnes.

Total area of production: The total area of rice harvested in 2017/18 was 7.7 million hectares (ha). About 52% of Vietnam's rice production is in the Mekong River Delta and 18% in the Red River Delta.

Number, size and types of producers: Rice farmers in Vietnam have small lots of paddy field. According to the General Statistics Office, in 2018, Vietnam had around 5 million farmer households (made up of 67% rural households and over 70% national labour force). An estimated 85% of rice households have a production area of less than 0.5 ha.

Juliane Franke

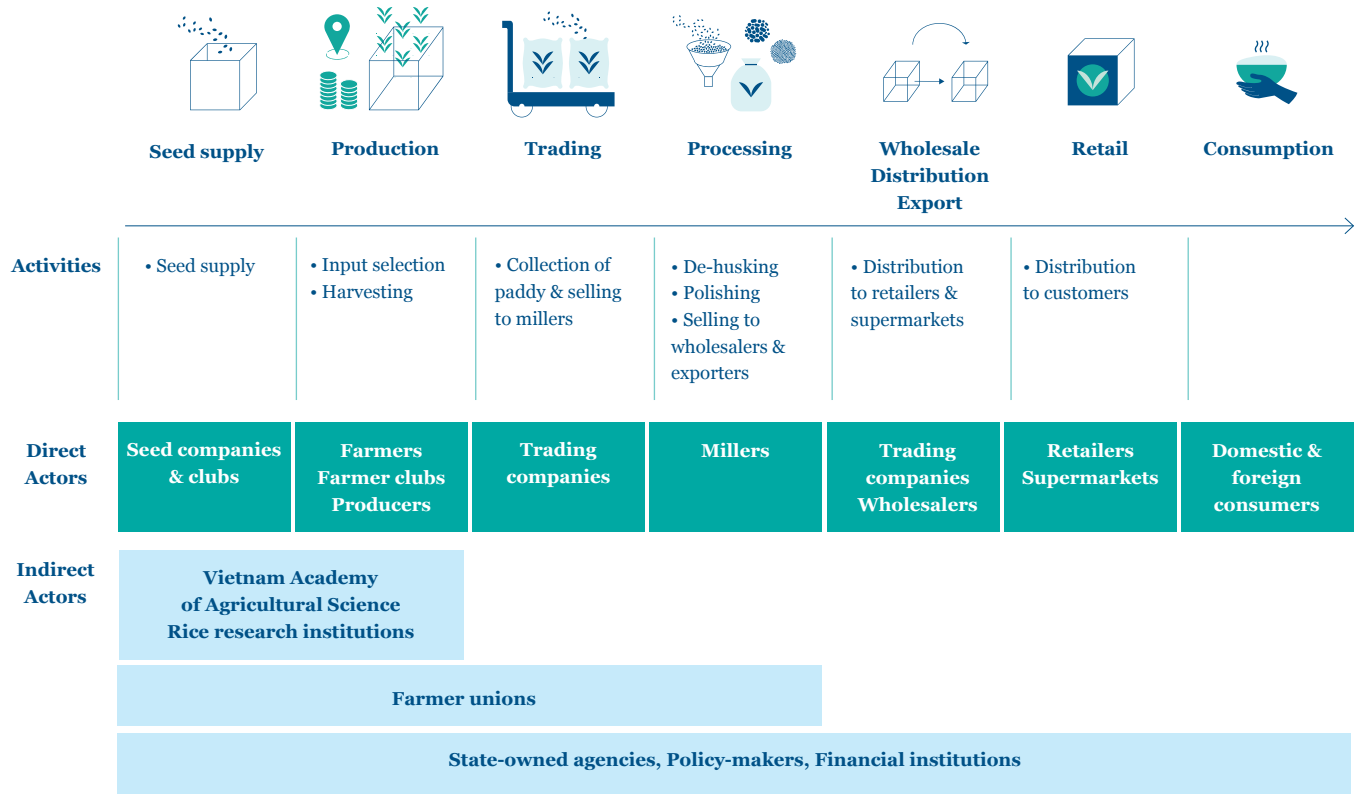
Vietnam Rice Production



For a list of references, see the References Section of the PMCR Report.

The rice value chain

The rice value chain builds on seven main processes from seed supply, production to consumption. Each process involves specific activities, which are conducted by direct actors and engage identified indirect actors.



Changes in climate conditions affecting the sector

• The agriculture sector in Vietnam is forecasted to be one of the most vulnerable to the negative effects of climate change involving changes in *rainfall*, temperature and *rising sea level*. The number and severity of natural disasters caused by climate change in Vietnam is continuously increasing.

• Climate change is already affecting the rice sector in Vietnam and the negative impacts on rice farmers are increasing. For example, changing climate conditions are already negatively impacting crop yields and have contributed to the reduction of cultivated lands.

• Rice requires ample *water* to grow and is very sensitive to *moisture stress*. Drought causes poor germination, reduced tillering, low plant fertility, reduced plant height, degraded seed quality and flowering delays.

• *Rising sea level* is expected to decrease the available production area and to reduce production yields through the exposure of rice growing areas to *saltwater intrusion*. Rice is only moderately tolerant to salt and yields will be reduced when submerged in saline conditions.

• An estimated 1.1 million hectares in the coastal areas, representing 70% of total cultivated land areas, are threatened by a sea-level rise of 1 meter and resulting saltwater intrusion. By 2030, rising sea levels in the Mekong delta would expose 45% of the land to extreme salinization and crop damage, with rice productivity falling by at least 9%.

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Resilience solutions

Identified resilience solutions in the rice sector in Vietnam include *new varieties* tolerant to extreme weather and climate variability (i.e. salty, drought, flood resilient varieties), *improved technologies to reduce emissions* of the sector, *adapted cropping systems and calendar* (i.e. production and post-harvest stages) to changing climate conditions, and innovation and advanced management of *climate data* in the entire value chain.

Leading resilience solution: *Climate-resistant seed varieties*

New submerged-tolerant rice variety SHPT3

The impact of submergence stress caused by climate change critically affects rice production. The new SHPT3 rice variety was created from a hybrid of two elite rice varieties. Research results in three different ecological zones in Northern Vietnam showed that the SHPT3 rice variety produces high yields of 7.0-7.5 tonnes per hectare in the spring season and 6.5-7.0 tonnes per hectare in the summer season. These results also indicate that this variety has outstanding agronomic characteristics, good submergence tolerance, and resistance to some major pests and diseases.

Key stakeholders

• Almost all climate resilience solutions and technologies are developed by *governmental agencies* and *research institutions*, such as the Vietnam Academy of Agricultural Science, and provided for free to the market. The State introduces and applies these technology solutions through the agricultural extension system, unions, mass media (papers, television, radio, etc.), workshops and performance models.
• The *private sector* receives these solutions and applies them in practice. Many *companies*, *NGOs* and *international organizations* also have projects to support farmers and producers in the regions adversely affected by climate change.
• *Seed companies* are private companies buying the copyrights of rice varieties, and producing and selling seeds to producers. Currently, there are both local and foreign seed companies in the market, the three largest being Thai Binh, Vinaseed and Loc Troi. Some seed companies are investing in the research of new seed varieties.

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Greatest opportunities related to the resilience solution

• The system of rice seed trading in Vietnam is developing quickly. Consequently, the distribution of climate resilient rice varieties through the system of seed points managed by the seed companies is potentially a resilience solution that could be developed efficiently.
• There is a good existing relationship between research institutions and companies. Companies have budgets to buy solutions developed by research institutions and are often funded by the government through projects or programs.
• Technology solutions for rice production and post-harvest are generally free for producers through the agricultural extension system. While producers must only invest in equipment, there is a significant need to improve the capacity and skills of farmers and extension workers.
• Under the guidance and management of the Government and State Bank of Vietnam, commercial banks have a budget to provide loans to the agricultural sector to develop production, poverty elimination and adaptation to climate change and variability. The development of this framework can potentially support uptake.

Main challenges related to the resilience solution

• Awareness and knowledge in the rice value chain is still limited. Due to the limited research on the topic, resilience solutions and good practices are lacking.
• The potential market of climate resilience solutions is very large as most farmers and producers, and rice production areas, are affected by climate change. While there is a proven increase in the demand of resilience solutions, with current information available and given the many variables involved, it is not feasible to estimate the potential market size of solutions.
• There is limited budget support from both the private and public sectors to research and apply the solutions in practice. Meanwhile, beneficiaries of the solutions, such as farmers, enterprises and traders, either lack the financial means or the interest to pay for them. The financial sector is underdeveloped and supply of formal financing is very limited. On the other hand, the informal financial sector is expanding, leading to higher interest rates and costs of resilience solutions.
• Small producers are very passive in finding climate resilient solutions, expecting that the solutions will be supplied by companies and governmental agencies. Consequently, the uptake of climate resilience solutions in the sector is low.

Resilience Solution - *Ratoon Rice*

After harvesting the main spring rice season, based on the tillering ability of rice varieties, rice ratooning can be practiced as an alternative to double cropping in the areas of available water. Ratoon rice grows 65% earlier than main crops and requires 50-60% less labor. The production cost is also lower than main crops due to the minimized cost for land preparation, transplantation, and crop maintenance. Ratooning requires a short duration, and yield is up to 50% of main crops, which increases the opportunity for cropping intensity per unit of cultivated area. The average yields of secondary generation hybrid varieties could reach 3-3.6 tonnes per hectare while conventional varieties could reach 2.5-3.3 tonnes per hectare with only around 50-60 days to maturity. Rice ratooning could be harvested in August, which is suitable for releasing free land for growing early winter crops such as maize, chili, pumpkin, etc. Recently, ratoon rice has been developed in the irrigated uplands of some Northern and Coastal Central provinces of Vietnam.

Resilience Solution - *Mechanization of rice production*

The use of mechanization in rice production from soil preparation and sowing to transplanting and harvesting has helped effectively exploit labour, time, environmental protection and more efficient input management. Mechanization in rice production has significantly altered farmers' perceptions and farming practices, shifting from a small-scale and unplanned farming approach to large-scale production. After several years of mechanization in rice production, productivity has increased from 10 to 15%, production costs have been reduced, and losses have decreased by 2-3%, while ensuring seasonality and improving the quality of rice.

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