

# CLIMATE-SMART RICE IN MYANMAR

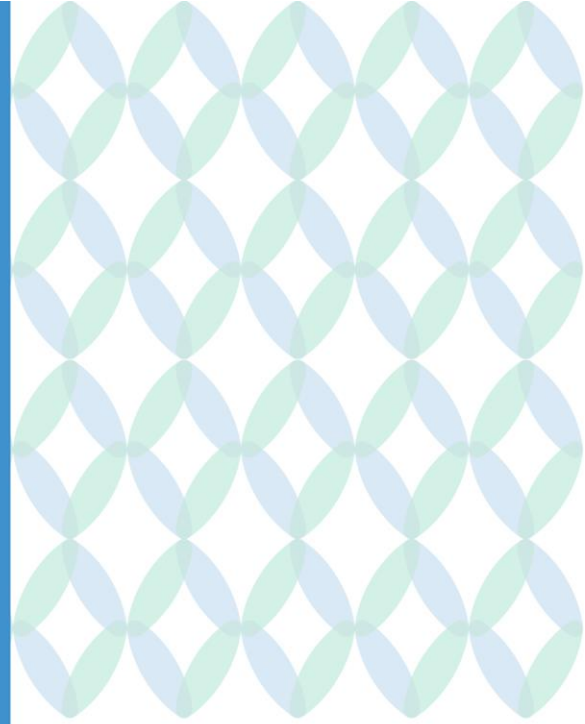
## *Lessons Learned*

Transformation of rice value chains through wide-scale adoption of climate-smart and resource-efficient sustainable best practices



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## PROJECT BACKGROUND

# GLOBAL RICE MARKETS AND MYANMAR

Rice is the staple food for 3.5 billion people or about half of the world's population, many of them impoverished or disadvantaged. It is projected that 590 million tons (MT) of rice will be consumed annually by 2050 (a 17% increase over 2017-19 levels) due mostly to increased populations in Africa and Asia.<sup>1</sup> With limited opportunity for area expansion combined with the expected impacts of climate change on productivity and resilience, there is an urgent need to drive sustainability in the global rice sector to meet future food needs while reducing greenhouse gas (GHG) emissions from rice cultivation.

Myanmar is a predominately rural nation richly endowed with natural resources such as vast areas of cultivable land, abundant water resources and a generally favorable climate for rice production. It is well positioned compared to its more urbanized and resource-stressed neighbors to respond to emerging market opportunities and increasing global demand for rice. At the national level, food production is sufficient for the country's domestic consumption. While most regions in the country are self-sufficient, the dry zone, border areas and remote areas however suffer from food deficits due to harsh weather conditions, remoteness and poor access to technologies. Only about 20% of Myanmar's agricultural area is irrigated, and most of these areas continue to have a low cropping intensity

with yields well behind other major rice-producing nations. Hence, there is a large potential to increase the sustainable productivity of rice in the country.

Unfortunately, as of late 2022 the Myanmar rice sector faces many constraints and challenges for its market actors due to the successive crises of the COVID-19 pandemic, political and economic disturbances after the military coup in February 2021 and subsequent violence, and disruptions of global commodity markets caused by the war in Ukraine. The coup has impacted Myanmar's food system more severely than COVID-19, notably increasing poverty rates of an already poor country.<sup>2</sup> This challenging situation in the rice sector shall not only be seen from the perspective of challenged rural livelihoods and income-generation but from a food security and nutritional perspective, as rice constitutes more than half of the daily calories consumed in a Myanmar household.



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<sup>1</sup> Samal, P., Babu, S. C., Mondal, B., & Mishra, S. N. (2022). The global rice agriculture towards 2050: An inter-continental perspective. *Outlook on Agriculture*, 51(2).

<sup>2</sup> Myanmar Agriculture Policy Support Activity (MAPSA). (2021). *Myanmar's poverty and food insecurity crisis*. Washington, DC: IFPRI <https://doi.org/10.2499/p15738coll2.134463>



## PROJECT BACKGROUND

# DESCRIPTION OF PROJECT OUTCOMES AND OUTPUTS

The Climate Smart Rice Project (CSR Project) was a four-year initiative aimed at supporting the agri-business sector and smallholder rice farmers to stimulate transformation of the rice sector towards sustainability. The project started in January 2019 and closed in 2022. The project was implemented in three diverse locations in Myanmar: Mandalay region, Southern Shan State, and Mon State/Bago region.

Focusing on rice-inclusive farming systems, the project prioritized enhancement of the livelihoods of smallholders through private sector development and partnerships aimed at the promotion of climate-smart and resource-efficient best practices in compliance with the Sustainable Rice Platform Standard (SRP Standard).<sup>3</sup>

This overall objective was pursued through the following three project outcomes using a simple “push-pull-policy” (PPP) approach. The first objective “pushed” producers towards sustainable and climate-smart rice production techniques; the second objective used the influence of downstream market players to “pull” producers towards adopting sustainable practices, while the third objective intervened at the “policy” level to establish a conducive framework and incentives for adoption of climate-smart and sustainable rice production in Myanmar. To reach these objectives, the project engaged directly with private sector actors including rice millers and value chain actors.



<sup>3</sup> Sustainable Rice Platform Standard. <https://www.sustainableice.org/resources/>

## PROJECT BACKGROUND

### **I. PUSH – Resilient rice-inclusive cropping systems widely adopted, leading to improved farmer livelihoods.**

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This component sought to strengthen and facilitate adoption of resilient and inclusive cropping systems with the aim of improving farmer livelihoods. This included the introduction of climate-smart best agronomic practices to farmers through adoption of the SRP Standard. Specifically, activities focused on training of field technicians (private sector, rice millers and extension officers) to implement the SRP Standard, training of lead farmers to assure improvement and compliance with the standard, establishment of field trials and demonstration plots, and implementation of ICT-based tools. The project also initiated activities to ensure that producers were trained and certified under GLOBALG.A.P./SRP and facilitated access to finance, insurance, services and innovative technologies. The climate-smart aspect of this approach was through improved water, nutrient and straw management.

### **II. PULL – Certified sustainable export and domestic rice value chains established and functioning.**

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Activities under this component focused on establishing sustainable certified export and domestic rice value chains. This included the creation of partnerships and linkages among both domestic and international value chain actors through SRP and its global network.

Private sector partners played a key role in this. A second focus of activities under this component was the upgrading of post-harvest processing (including drying, storage, cleaning, transportation, milling, seed quality) through technical assistance, demonstrations such as mobile rice drying, business planning support and facilitating access to finance. Under this component, options were considered for crowding-in of new institutional partnerships to leverage and de-risk commercial sector development.



### **III. POLICY – Policy and regulatory framework strengthened to incentivize wide-scale adoption of sustainable best practice packages.**

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It was initially planned that the project would establish national-level policy exchanges to strengthen resilience to climate change and natural disasters through mainstreaming resource-efficient sustainable best practices. Due to the political coup roughly two years into project implementation, however, much of the “policy” approach was cancelled and a no-engagement policy with authorities in Naypyitaw was established.

## PROJECT BACKGROUND

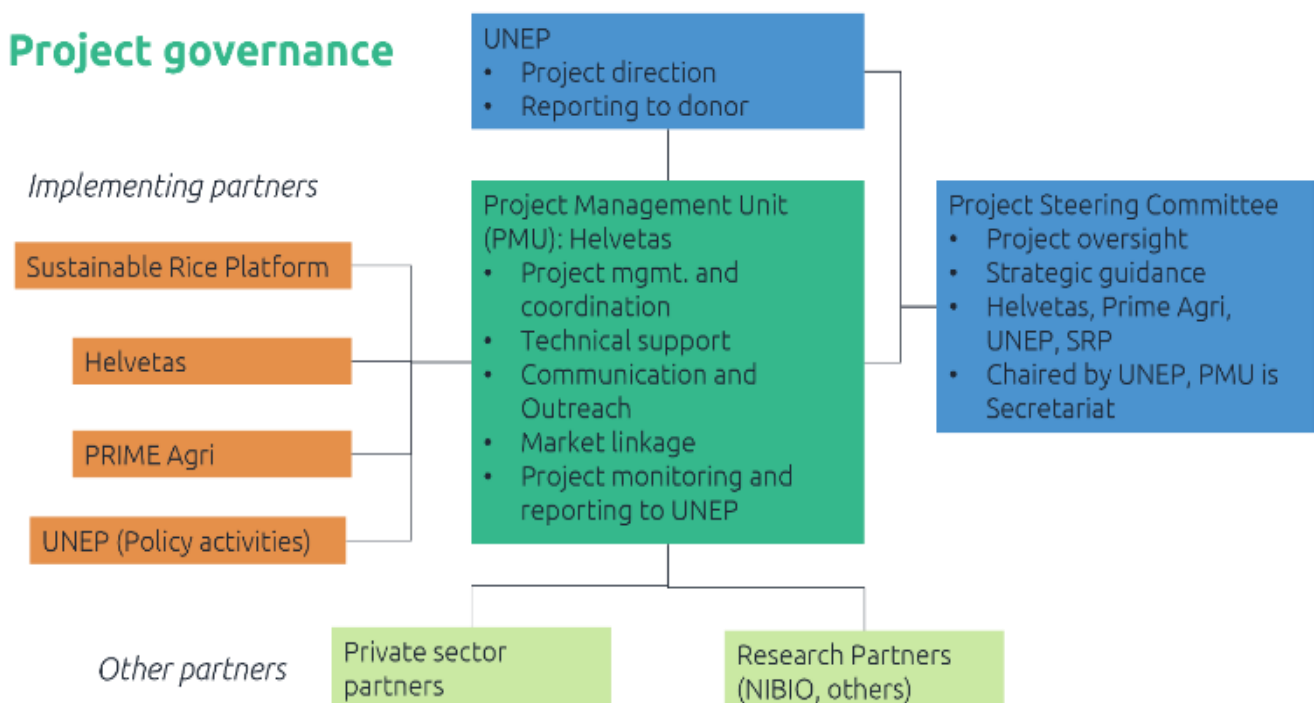
# PROJECT GOVERNANCE AND PARTNERS

The project was coordinated by the UN Environment Programme (UNEP) which served as the contractual partner with the project donor, the Norwegian Agency for Cooperation and Development (NORAD). Operationally the project was managed by a Project Management Unit (PMU), led by Helvetas Swiss Intercooperation (Helvetas), that was responsible for project management, coordination and oversight of the overall implementation. The PMU operated from Myanmar and also led communications and outreach. The PMU was governed by a Project Steering Committee tasked with overall project oversight, strategy development, monitoring and evaluation. The committee was comprised of all the key implementing partners i.e., UNEP, SRP, PRIME Agri Ltd., and Helvetas. Other project partners included private sector actors in Myanmar and the Norwegian Institute of Bioeconomy Research (NIBIO).

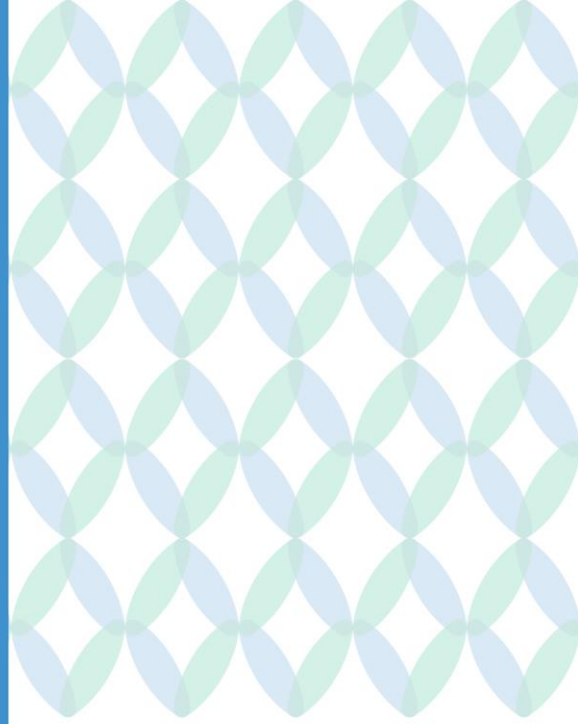
The project was co-funded by the Swiss Agency for Development and Cooperation Global Programme Food Security through the Water Productivity Project (WAPRO). Since its launch in 2015, this project has been implemented by Helvetas in Central Asia, India and Pakistan together with SRP, Mars Food and other partners covering the two main water-intensive crops (rice and cotton). WAPRO has successfully brought together multiple stakeholders to join forces to enhance water productivity using the PPP approach and attracted global interest.

The WAPRO co-funding was managed by Helvetas directly. The implementation of these project activities was executed under the auspices of the same project and in close collaboration with the PMU.

## Project governance



# Project Outcomes



## PROJECT OUTCOMES

# PROJECT OUTCOMES AND ACHIEVEMENTS

### Project Results Context

Myanmar has faced several simultaneous crises from 2020 onwards: COVID-19, climate crisis, the military coup and ongoing civil violence. These have led to challenges for the Myanmar rice sector with the main challenge as of May 2022 being conflict escalation.<sup>4</sup> Banking disruptions have been the major obstacle for input providers and rice millers. Disruptions related to insecurity and checkpoints have further increased transport costs, often affecting wholesalers and retailers. Power outages have also affected agro-processors, including rice millers.

Within the rice market system, farmers appear to have the lowest negotiating power and increased costs through inflation are largely absorbed at farm level. Since the military take-over, 49% of farm households have reported an average 43% reduction in their income. The estimated area of paddy planted in 2021-22 is 7% below the average of the past three years.<sup>5</sup> The prices for most inputs used in rice cultivation have increased significantly, including transportation costs. Rising input costs (fertilizer, seeds and fuel) and limited access to financing are likely to discourage farmers from planting. Many farmers have reduced the use of critical inputs and, in some cases, the area under cultivation.

### The Overall Strengths of the Project Were:

- Farmer engagement through a variety of training/demonstration methods and follow-up.
- Cultivation of relationships directly with rice millers.
- Private sector partnerships.

### The Overall Weaknesses and Unfulfilled Assumptions Were:

- Progress towards a sustainable rice value chain suffered from some lack of partnerships, specifically logistics and supply chain actors to facilitate the movement of rice for export.
- The project duration was not sufficient to establish a sustainable rice value chain, impeded also by conflict, trade policies and COVID-19.
- International demand for sustainable rice from Myanmar was not as strong as assumed.
- SRP was still finalizing Chain of Custody and the Assurance Scheme during project implementation, which delayed the project's response to these requirements.
- Myanmar is known for low-quality local rice, and the project failed to overcome this image.
- After the coup in Feb 2021, global investments in Myanmar stopped.

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<sup>4</sup> World Bank, 21 July 2022. Myanmar Economic Monitor.

<https://pubdocs.worldbank.org/en/597471658359366101/July-MEM-2022-Final>

<sup>5</sup> Takada, M. Haile, M.G., Ambrosio-Albalá, M. (31 May 2022). Myanmar - Food Security and Agriculture Monitoring Brief (English). Washington, DC: World Bank Group.

<http://documents.worldbank.org/curated/en/099459407082213027/IDU09b2f3a9b08afd048970aebd0f24c727e0d65>



## PROJECT OUTCOMES

### PUSH component results

The project achieved many of the goals in the “push” component despite the challenges. A total of 5,221 farmers were trained to apply the SRP Standard to their crops. These farmers were observed to be more resilient due to the adoption of cost-saving practices. The advantage of adopting SRP Standard practices was observed in terms of farm-level cost savings and yield increases rather than in terms of market incentives i.e., the farmers are the main beneficiaries in comparison to other stakeholders along the rice value chain.

In the case of farmers adopting the SRP Standard, the shift to improved practices and technologies allowed the farmers to maintain an average yield of 4.8 MT/ha, which is 21% higher than the yields achieved by conventional farmers in the Coastal Region. The combination of a cost reduction and a higher yield permitted SRP-trained farmers to reach an average margin of 882,580 MMK/ha, while other farmers were only able to receive a margin of 403,448 MMK/ha. The use of quality rice seeds, drum seeders, optimized fertilization schemes and the application of integrated pest management have provided considerable benefits to farmers.

Myanmar lacks public extension services for rice farmers. Thus, the extension services from the private sector, which included training and regular coaching, were crucial in the introduction and adoption of resource-efficient and climate-smart practices to help maintain the rice yields of smallholder rice farmers.

During the last two production seasons (2021 monsoon and 2021-22 summer), the farmers obtained higher scores during the SRP Level 2 audits (second party-verified) of 91% and 93% compliance, respectively. Areas in which

the farmers struggled to meet the SRP Level 2 were as follows:

- Land levelling: Due to poor access to land levelling service providers and high costs of such services, some farmers missed the threshold.
- Rice straw management: In some project areas, due to technical limitations as well as poor access to bio-decomposers, the farmers were not able to manage their rice straw effectively and therefore burnt the residues.
- Personal Protective Equipment (PPE): Due to a lack of appropriate PPE and, if available, the unpractical design of PPE for field use, farmers tended not to use PPE for pesticide exposure risk reduction.

Twelve rice millers and companies also worked with 2,889 farmers who became SRP Level 3-verified, which requires a third-party audit. Two rice companies also completed the Chain of Custody verification process, which allows them to make sustainability claims for their products.

For the millers, the benefits of procuring rice from SRP-trained farmers came from the lower percentage of broken rice and the margin from trading rice of improved quality. The rice miller partners of the project provided 432 MT of quality seeds along with fertilizer and credit to 2,404 farmers as farm advance under a contract farming scheme, thus supporting farmers with higher-quality inputs. Millers and other private sector partners also bought back 80% of the rice and 100% of the quality seed produced by farmers under the scheme.

## PROJECT OUTCOMES

### PULL component results

The CSR Project made less progress in the “pull” component. This was due to a variety of factors including political instability, inflation and global grain trade dynamics. In two of the three project regions, rice produced by SRP-trained farmers was sold back into the local market or to large exporters, meaning that this rice was not sold into a sustainable rice-specific value chain. An overall lesson in this area is that a longer implementation period would be required to reach the goals of the “pull” component, especially given the challenging circumstances that also affected one of the project’s core assumptions, which was that Europe would be the primary market for sustainably produced Myanmar rice. This demand was not fulfilled due, in part, to hesitance to engage with the Myanmar market. Other challenges such as high international shipping costs and unstable banking services in Myanmar also had an impact.

The project started with one main private sector partner, Prime. During the final year of the project, new private sector partners were added in the Central Dry Zone because at the previously chosen project sites, farmers were not able to plant rice during the dry season due to drought. While these partners were only engaged for two growing seasons, relatively more progress was made in value chain development as this area (Sagaing) grows higher-quality rice and has better market access. In the final project year, rice produced in this region will be sold as SRP-Verified in domestic markets.

In the other project regions, the main project impact was capacity building of rice millers through business development training, post-harvest technology improvements and facilitation of contract farming with SRP-trained farmers. Overall, 14 rice mills were

upgraded for improved storage and milling operations. The project supported capacity development on the topics of financial management and branding/digital marketing for rice miller partners through a series of training and follow-ups. The project also collaborated with the Tha Ba Wa project that is EU-funded and WWF-implemented in undertaking energy audits benefitting four rice millers in Bago Region in 2021. After final individual consultation workshops between those millers and the audit team, the millers started implementation of the provided recommendations thereby showing a positive reception of the overall energy audit process. The project has also established a contract with an audit team to conduct energy audits at the sites of four rice miller partners in Mon State.



In Southern Shan State, the project has supported the installation of four rice drying facilities under the management of three village development committees (VDC). These facilities can provide drying services to more than 4,500 acres of rice fields each production season. As these dryers can also be used for corn drying, additional revenues

## PROJECT OUTCOMES

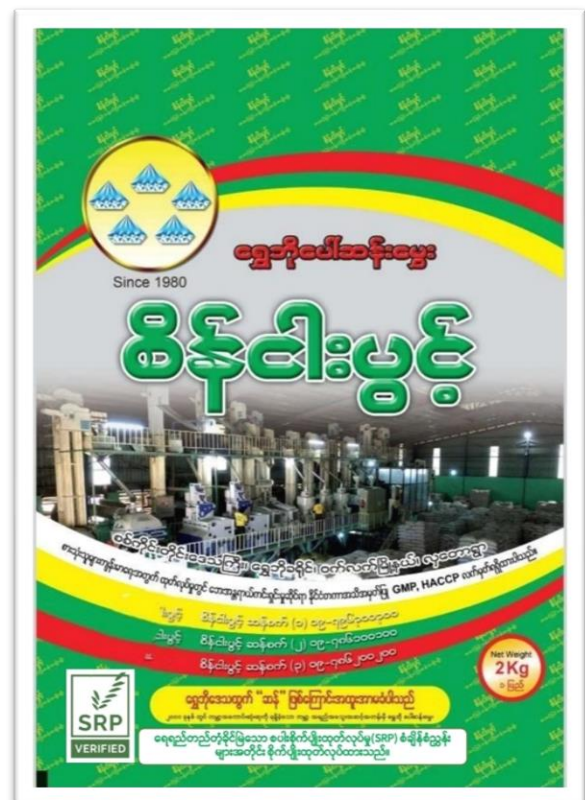


can be generated for each VDC. In consultation with respective farmers the VDC will use a portion of the profit for village development activities. With the recent increase in fuel costs, two of the dryers have been installed with a rice husk-fueled burner which will reduce the unit cost of drying and utilize rice husk as a renewable source of energy for the rice mills.

For the sustainability and scale of the project interventions, the project arranged discussion rounds with three private sector business associations, namely the Coastal Farmers Development Association Mon (CFDA (Mon)), CFDA (Bago) and the Pawsan Rice Producers Association (Sagaing). As a result of the discussions between the associations, rice miller partners and the PMU, two main future commercial activities in line with the project objectives were identified to continue the promotion of the SRP Standard beyond the project duration: the distribution of farm inputs, and the facilitation of market linkages based on the association membership program. The project has already signed respective agreements with CFDA (Mon) and CFDA (Bago). Support for the Pawsan Rice Producers Association (Sagaing) has been agreed on based on the envisioned commercial model of the association.

## POLICY component results

A policy report on climate-smart rice in Myanmar was completed in 2022, however its observations and recommendations may no longer be applicable in the current context. The study found that Myanmar's rice sector has been focused on low-quality exports but could greatly benefit from shifting towards quality and sustainability as sustainable rice production effectuates the quality improvement of rice, unlocking high-value export markets regionally and globally. Milling is a key aspect to improving rice quality, as is production of quality and certified seeds that are suitable to the local climate and soil conditions. The study also found that socially- and environmentally responsible contract farming conveys a useful mechanism to upscale sustainable rice cultivation in Myanmar. Experience from the project implementation showed that informal "handshake agreements" are prevalent.



Packing of SRP Verified rice to be sold in the domestic Myanmar market due to the project

# Lessons Learned





## LESSONS LEARNED

# LESSONS LEARNED FROM THE MYANMAR CLIMATE-SMART RICE PROJECT

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## 1) On-farm economics drives adoption of the SRP Standard.

Because farmers are unable to obtain premium prices for sustainably produced rice on the market (nor was this part of the project's assumptions), the benefits of adopting these best practices must outweigh the costs to the farmer. In this project, farmers who adopted the SRP Standard's good practices benefitted from better water efficiency, higher yields and/or lower costs of inputs. Farmers may not, however, necessarily be able to quantify the cost savings ex-ante nor have the resources to experiment with different practices. The challenge of similar projects is hence to overcome the "viability gap" of best practice adoption through demonstrations and agronomic consultations.

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## 2) Higher-value and specialty rice markets may be better oriented to sustainable value chain development.

Myanmar is known in the global rice market for supplying cheap, broken rice. As this type of rice is inter alia used for animal feed, the beverage industry, and rice starch and flour, there is less demand for this type of rice as a sustainable commodity. Rice from Myanmar's Sagaing Region is known for its premium

quality however and it was easier to establish sustainable value chains there through value chain actors who have higher capacity for marketing and export. The positive experience of SRP value chain development with Basmati rice in Pakistan supports this assumption and there is a mostly unexplored opportunity to further develop the domestic and Asian sustainable rice value chain.



The original project assumption was that European markets would have demand for sustainable rice from Myanmar. However, higher potential may be in Asian markets such as the Philippines, which already imports Myanmar rice, and the high-end domestic market. It took time for the project to realize this. Specialty rice products such as parboiled rice, organic rice, and nutritional rice are sold in the high-end markets as new market segments in the urban areas. Three potential market segments for SRP-Verified rice have been identified: 1) the domestic market in the region as per current practice; 2) domestic high-end urban markets in the country; and 3) the export market through contract farming. Rice millers have the potential to engage in

## LESSONS LEARNED

the contract farming mechanism and access high-end domestic market through value addition (cleaning, color sorting, packaging, SRP branding).

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### 3) Gender and human rights are fundamental to agriculture-based projects and must be included in project design and indicators.

The project proposal stated that gender mainstreaming would be central to the project's policy advocacy and that human rights as a cross-cutting issue would be integrated into the project and followed throughout implementation. Gender empowerment was not included in any project indicators, however, and the only activity specified in the work plan was a gender study.



Participation data by gender was collected for project activities, but this was not adequate to assess gender empowerment or economic inclusion. The gender study was conducted by a consultant, but adequate resources were not allocated to following up on the gender empowerment-related recommendations of this study or the project's mid-term review.

The human rights-based approach was also not formalized into the UNEP project design, although it is noted that the project sites were purposefully chosen to engage with a diversity of ethnic groups including the conflict-affected Sagaing Region. The project implementers also carried out relevant security and risk mitigation measures to support rice producers in this challenging environment. Future climate-smart agriculture projects must ensure that gender and human rights are fundamental to the project design and included in the project indicators. Tools such as the Women's Empowerment in Agriculture Index can be utilized.<sup>6</sup>

The following factors should also be considered in future projects: engaging women as staff, trainers and extension agents; evaluating both the positive and negative impacts of mechanization on women's time and income; and provisioning of women-specific mechanization tools. The role of women in the agricultural value chain beyond production should also be addressed.<sup>7</sup> It may be advisable to conceptualize project follow-up activities that would address these lessons learned including the loss of income for women through mechanization amidst limited skill development opportunities.

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<sup>6</sup> WEAI Resource Center. <https://weai.ifpri.info/>

<sup>7</sup> Agrilinks, 24 October 2022. "Why We Need Formative Approaches When Measuring Women's Empowerment in Agricultural Market Systems." <https://agrilinks.org/post/why-we-need-formative-approaches-when-measuring-womens-empowerment-agricultural-market-systems>

## LESSONS LEARNED

### 4) Rice variety matters: locally adapted, high-quality varieties needed while variety also affects market potential.

High-yielding varieties and hybrid rice varieties are increasingly grown in Myanmar, particular in upland areas. However, it may also be beneficial to promote those varieties preferred by the domestic market which are also high-quality and genetically purified in line with government specifications. This benefits the farmers who cannot afford to purchase new seeds every year. In this respect, the rice millers saw the advantage of seed multiplication schemes with locally adapted rice varieties. Adoption of certified or good-quality seed by the farmers (instead of saving seed) also increased at the farm level during the project period. Future projects should facilitate local seed production schemes for high-quality, locally adapted varieties. Certified seed production can be an economic opportunity for both farmers and rice millers.

As the variety of rice affects its market demand, this should also be considered. For example, future projects should more explicitly determine whether to target production of locally consumed varieties, high-yielding varieties or high-value varieties. A study of rice varieties in coastal Myanmar found that adoption of high-value varieties was associated with a higher income and profit despite having lower yield.<sup>8</sup> In areas with flooding and saltwater intrusion, however, farmers must grow local varieties that are tolerant to these stressors.



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### 5) The climate component of the project could have been better emphasized and quantified.

Climate mitigation and adaptation are both central to the concept of climate-smart agriculture. They are also relevant to the SRP Standard which promotes practices such as alternate wetting and drying to reduce water use and methane emissions, and site-specific nutrient management and organic fertilizer to reduce nitrous oxide emissions. The SRP Standard also promotes climate adaptation through efficiency of resource usage. Yet, measuring GHG emissions was not conducted systemically at the project sites and therefore no direct claims regarding climate mitigation can be made. Efforts were made to collect GHG measurements but due to the challenging context, this work was paused. In future projects, quantification of GHG mitigation and climate adaptation benefits of the SRP Standard should be investigated.

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<sup>8</sup> Muraoka, R., Furuya, J., Hirano, A., & Sakurai, T. (2022). Climate risk and agricultural technology adaption: evidence from rice farmers in the Ayeyarwady River delta of Myanmar. *Paddy and Water Environment*, 20(1), 23-36. <https://link.springer.com/article/10.1007/s10333-021-00870-7>



## LESSONS LEARNED

Climate impacts were observed during the project period, especially drought and flooding. Due to drought, project activities were moved out of Mandalay region since rice could not be grown during the dry season due to a lack of irrigation. To improve resilience to climate change, farming system diversification should be promoted to farmers in dry zones including crops complementary to rice. Related to this, the project focused on evaluation of different climate-resilient rice varieties but in the future should also demonstrate crop diversity.

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### 6) Working with the private sector was challenging but it allowed learning and reduced the risk of project failure.

Engaging with actors along the rice value chain improved achievement of the project results. Working through the rice millers was effective to improve the quality of milled grain (with a lower percentage of broken rice) which economically benefitted the millers and to provide services to the farmers such as provisioning of quality inputs. It was found that the model of miller engagement was more effective for higher-quality crops (such as specialty rice varieties) because millers

have the incentive to segregate and differentiate the products. This model also improved the social coherence between rice millers and the farmers, who could gain a better understanding of each other beyond a business relationship.



Meanwhile it took some time to understand how each of the non-miller project partners, with their diverse backgrounds, worked. During the project it was realized that there should be a separation between the roles of value chain actors and service providers in the project partners. The importance of having multiple private sector partners was also realized, as this reduces project risks.

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### 7) Export market development: A need to quickly mobilize information and agreements.

When the project communicated with potential international rice buyers, information could be delayed by going through multiple layers of value chain actors. Some of the potential international buyers do not have a local presence, which made contract negotiations more difficult, with delays in determining a price point, the



## LESSONS LEARNED

variety, quality and quantity that millers could offer to potential buyers.

To facilitate the international sale of milled rice, one would need to quickly mobilize agreements with external suppliers, agents and trade contacts in terms of quoting, logistics, understanding (and sometimes accepting) cost structures. This information took time to gather, especially if millers did not have prior export experience. Ideally, discussions with potential buyers would occur before planting so the desired varieties can be planted. Projects should monitor production by variety to document expected output by season, so this information could easily be given to buyers. To expedite communication delays, relevant information should be compiled and delivered comprehensively to buyers, with the understanding that prices in commodity markets can change dramatically.



### 8) Moving rice to port is not simple and requires a network of value chain actors.

During the project period it became clear that most rice millers are unable to become direct rice exporters. Exporting requires access to credit and permits, and millers face unfavorable payment terms from international buyers amidst a lack of export credit facilities in Myanmar. Millers also must comply with the food safety standards and a lot of documentation is needed to export.

Meanwhile, developing the necessary license and skills to export may be a time-consuming, costly and challenging process relative to the size of opportunity and potential, and it is more beneficial for millers to sell rice to the local market or large export companies which offer a higher down payment than international export companies. Hence third-party intermediaries can play a role; however, the project did not pursue this option.

Future export value chain development projects should consider the role of a network of value chain actors to aid movement of milled rice to ports/warehouses, and who could also facilitate ability to offer Free-on-Board (FOB) pricing that buyers can consider. Future projects should develop relationships with licensed exporters who can deliver such a service.