



RICE-Adapt: Promoting Climate-Resilient Livelihoods in Rice-Farming Communities in the lower Ayeyarwady and Sittaung River Basins

Part I: Project Information

GEF ID

10395

Project Type

FSP

Type of Trust Fund

LDCF

CBIT/NGI

CBIT **No**

NGI **No**

Project Title

RICE-Adapt: Promoting Climate-Resilient Livelihoods in Rice-Farming Communities in the lower Ayeyarwady and Sittaung River Basins

Countries

Myanmar

Agency(ies)

FAO

Other Executing Partner(s)

Ministry of Natural Resources and Environmental Conservation (MONREC) & Ministry of Agriculture, Livestock and Irrigation (MOALI)

Executing Partner Type

Government

GEF Focal Area

Climate Change

Taxonomy

Climate Change, Focal Areas, Climate Change Adaptation, Community-based adaptation, Innovation, Climate information, Private sector, Least Developed Countries, Adaptation Tech Transfer, Ecosystem-based Adaptation, Livelihoods, Mainstreaming adaptation, Disaster risk management, Climate finance, Climate resilience, Influencing models, Demonstrate innovative approach, Convene multi-stakeholder alliances, Strengthen institutional capacity and decision-making, Stakeholders, Beneficiaries, Civil Society, Community Based Organization, Communications, Awareness Raising, Local Communities, Type of Engagement, Partnership, Information Dissemination, Participation, Private Sector, SMEs, Individuals/Entrepreneurs, Gender Equality, Capacity Development, Gender results areas, Participation and leadership, Access to benefits and services, Knowledge Generation and Exchange, Access and control over natural resources, Gender Mainstreaming, Women groups, Sex-disaggregated indicators, Gender-sensitive indicators, Capacity, Knowledge and Research

Rio Markers**Climate Change Mitigation**

Climate Change Mitigation 1

Climate Change Adaptation

Climate Change Adaptation 2

Submission Date

10/11/2019

Expected Implementation Start

1/1/2022

Expected Completion Date

6/30/2027

Duration

60In Months

Agency Fee(\$)

848,580.00

A. FOCAL/NON-FOCAL AREA ELEMENTS

Objectives/Programs	Focal Area Outcomes	Trust Fund	GEF Amount(\$)	Co-Fin Amount(\$)
CCA-1	LDCF Objective 1: Reduce vulnerability and increase resilience through innovation and technology transfer for climate change adaptation	LDC F	7,432,420.00	32,000,000.00
CCA-2	LDCF Objective 2: Mainstream climate change adaptation and resilience for systemic impact	LDC F	1,500,000.00	8,000,000.00
Total Project Cost(\$)			8,932,420.00	40,000,000.00

B. Project description summary

Project Objective

Enhance the resilience and adaptive capacities of vulnerable rice-producing communities in the Ayeyarwady Delta and Bago-Sittaung River Basin in Myanmar through an ecosystem based and market driven approach

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing (\$)
Component 1: Enhancing the enabling environment for climate change adaptation mainstreaming in the agriculture sector through integrated policies and planning	Technical Assistance	<u>Outcome 1:</u> Strengthened policy and planning frameworks for climate change adaptation and governance at national and/or subnational/ local level	<p>Output 1.1</p> <p>Mechanisms for improved cross-sectorial coordination at national and/or subnational level to support climate change adaptation in the agriculture sector.</p> <p>Output 1.2</p> <p>Climate Change Education Center established and capacity building program implemented.</p> <p>Output 1.3</p> <p>Climate change adaptation priorities incorporated into agriculture sector related policies, plans or development frameworks.</p>	LD CF	653,750.0 0	4,500,000. 00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing (\$)
Component 2: Promoting resilience and adaptation in rice-based farming systems, communities and landscapes	Investment	<u>Outcome 2:</u> Increased resilience and adaptation of rice-based farming systems, communities and landscapes	<p>Output 2.1</p> <p>Targeted capacity building for local public and private institutions on local adaptation planning and implementation, including Agroecology and agromet services.</p> <p>Output 2.2</p> <p>Participatory climate risk and vulnerability assessments conducted in the target areas and adaptation measures prioritized.</p> <p>Output 2.3</p> <p>Climate farmer field schools and field demonstrations implemented on innovative climate-resilient/ agroecological practices[1].</p> <p>Output 2.4</p> <p>Field implementation support provided to farmers (including women and vulnerable groups) to adopt climate-resilient/ agroecological practices.</p> <p>Output 2.5</p> <p>Participatory research/ participatory varietal selection of stress-tolerant varieties and quality seed production implemented.</p> <p>Output 2.6</p> <p>Capacity building in trust</p>	LD CF	4,043,150 .00	14,000,00 0.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing (\$)
Component 3: Scaling up adaptation technologies and innovations in selected value chains, and improving market access	Investment	<u>Outcome 3:</u> Resilient livelihoods through innovations and improved access to technologies and markets	<p>Output 3.1</p> <p>Value chain network established and priorities for strengthening resilience in selected value chains identified.</p> <p>Output 3.2</p> <p>Targeted capacity building for agricultural cooperatives, SMEs and farmer organizations/ groups in identified priority areas.</p> <p>Output 3.3</p> <p>Women and youth entrepreneurship strengthened for increased resilience of rural livelihoods.</p> <p>Output 3.4</p> <p>Climate-resilient storage facilities and processing technologies are introduced/ improved in target communities for value addition and to reduce losses.</p> <p>Output 3.5</p> <p>Contract farming and partnerships established with local/national/global value chain actors to improve access of small-scale producers to markets, credit, technologies, and services.</p>	LD CF	2,995,628 .00	16,000,00 0.00

Project Component	Financing Type	Expected Outcomes	Expected Outputs	Trust Fund	GEF Project Financing(\$)	Confirmed Co-Financing (\$)
Component 4: Monitoring & Evaluation, communication and knowledge transfer	Technical Assistance	<u>Outcome 4:</u> Project monitored and evaluated, lessons learnt and knowledge of adaptation innovations disseminated	<p>Output 4.1</p> <p>Project M&E system and adaptive learning and management established and implemented.</p> <p>Output 4.2</p> <p>Communication and knowledge management strategy developed and implemented, including national and international knowledge sharing on SRP.</p> <p>Output 4.3</p> <p>Information and M&E systems to monitor and evaluate adaptation and resilience in agriculture enhanced.</p>	LD CF	818,300.00	1,500,000.00
				Sub Total (\$)	8,510,828.00	36,000,000.00
Project Management Cost (PMC)						
			LDCF	421,592.00	4,000,000.00	
			Sub Total(\$)	421,592.00	4,000,000.00	
			Total Project Cost(\$)	8,932,420.00	40,000,000.00	

C. Sources of Co-financing for the Project by name and by type

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Investment Mobilized	Amount(\$)
Donor Agency	Asian Development Bank (ADB) through MOALI	Grant	Investment mobilized	40,000,000.00
Total Co-Financing(\$)				40,000,000.00

Describe how any "Investment Mobilized" was identified

The investment mobilized are considered, as per GEF definition, not recurrent expenditures. The investment mobilized from the co-financing sources will be new capital investments. The indicative co-finance listed as investment mobilized has been identified through consultations with partners from the following sources. However, the ADB projects in Myanmar have been temporarily suspended due to the political situation in the country. Thus, the co-financing letters have not yet been secured. ? ADB: Resilient Community Development Project (RCDP) USD 7.5 million ? ADB: Strengthening Climate and Disaster Resilience of Myanmar Communities USD 32.5 million

D. Trust Fund Resources Requested by Agency(ies), Country(ies), Focal Area and the Programming of Funds

Agency	Trust Fund	Country	Focal Area	Programming of Funds	Amount(\$)	Fee(\$)
FAO	LDC F	Myanmar	Climate Change	NA	8,932,420	848,580
Total Grant Resources(\$)					8,932,420.00	848,580.00

E. Non Grant Instrument

NON-GRANT INSTRUMENT at CEO Endorsement

Includes Non grant instruments? **No**

Includes reflow to GEF? **No**

F. Project Preparation Grant (PPG)

PPG Required **false**

PPG Amount (\$)

200,000

PPG Agency Fee (\$)

19,000

Agency	Trust Fund	Country	Focal Area	Programmin g of Funds	Amount(\$)	Fee(\$)
FAO	LDC F	Myanmar	Climate Change	NA	200,000	19,000
Total Project Costs(\$)					200,000.00	19,000.00

Core Indicators

Provide additional explanation on targets, other methodologies used, and other focal area specifics (i.e., Aichi targets in BD) including justification where core indicator targets are not provided

Please refer to the CCA Indicator Framework uploaded in the document section.

Part II. Project Justification

1a. Project Description

- 1) Global environmental and/or adaptation problems, root causes and barriers that need to be addressed (systems description)

A. Country overview

The Republic of the Union of Myanmar (Myanmar) is situated on the western end of Southeast Asia and with a land area size of 676,578 km², Myanmar is the largest country in mainland Southeast Asia. The country is divided into three main agroecological zones: Central Dry, Coastal and Hilly and comprises the central lowlands of the Ayeyarwady, Chindwin and Sittaung River valleys, highlands in the north, east and west and the coastal belt in the south and southwest. Myanmar has a tropical climate with three seasons: a cool winter from November to February, a hot summer season in March and April and a rainy season from May to October, dominated by the southwest monsoon.

Myanmar has an estimated population of 53 million and more than 70% lives in rural areas, with Ayeyarwady region having the largest proportion of rural population (about 86%). Myanmar is a Least Developed Country (LDC) although the country has experienced rapid growth in recent years, becoming one of the world's fastest growing economies.[1]¹

Myanmar's socioeconomic development relies on climate-sensitive sectors with agriculture being the largest economic sector, contributing up to 30% of GDP and employing over 60% of the country's labour force. Approximately 25% of the country's population lives below the poverty line and nearly 85% of the poor live in rural areas where livelihoods are closely tied to the natural resource base and agriculture sectors (rainfed agriculture, livestock, fisheries and forest resources). Rice is the predominant food crop commodity in Myanmar, covering almost two-thirds of cultivated land. In addition to crops, aquaculture and livestock (including cattle, small ruminants, chicken, and ducks) are important livelihood activities for many smallholder farmers. Farmers keep their livestock under mixed rice and livestock farming systems. Livestock are an integral part of the agricultural economy and farming practices generally use the draft power of cattle. Small farm machinery, such as power tillers,

small tractors, threshers, etc., has been applied for a few decades, with an acceleration in utilization of small-scale mechanization in recent years.[2]²

Myanmar ranked the second country most affected by extreme weather events (storms, floods, heat waves etc.) in the Global Climate Risk Index 2020.[3]³ Myanmar's population and economic activities are concentrated in disaster risk-prone areas such as the Delta, Coastal and Central Dry Zones. These Zones are highly exposed to natural hazards, such as cyclones or floods, and have both high poverty levels and low adaptive capacities. Impacts from climate change are posing a serious threat to the efforts for placing Myanmar on a sustainable and resilient development pathway. The largest part of Myanmar's population is concentrated in two main areas: the Delta area (50,400 km²) which is most exposed to recurring tropical storms, cyclones and floods and potential storm-surge effects, and the Dry Zone, which is exposed to chronic drought, extreme temperatures and other risks.

Myanmar is one of the world's top 10 rice exporting countries, but its ability to maintain its contribution to global food supply is highly threatened by the impacts of climate change and extreme events, with adverse effects on livelihoods, ecosystem functioning, food production and the overall economy of the country. The increased risk and vulnerability of agriculture sub-sectors as compounded by climate change is thus further challenging rural livelihoods and food security, leaving already resource poor communities even more vulnerable to natural disasters and climate change impacts.

B. Rice sector in Myanmar

Rice is the staple food for Myanmar people and remains a strategic sector in terms of its continuing significant contribution to GDP, income and employment generation. Among the seven largest rice producers in the world, Myanmar ranks sixth in area sown to rice and seventh in total production.[4]⁴ Rice accounts for the most important sown area of crops in Myanmar with almost 7.3 million hectares, representing 42% of the entire sown area in financial year 2017-18.[5]⁵ About 80% of the annual production is harvested during the monsoon season and the remaining 20% during the summer season. About 50% of the total production comes from the Delta comprised of Ayeyarwady, Bago and Yangon regions. Myanmar's performance in generating an increasing exportable surplus has been erratic up to recently at the Union as well as at the different region/state levels.[6]⁶ Myanmar's rice production still faces challenges including low productivity, high labour costs, and low profits. Delta region farmers generally use too much rice seeds to establish their crops whereas they would stand to benefit from higher levels of adoption of high-yielding varieties and more rationale use of agrochemicals, fertilizers in particular.[7]⁷ Additionally, export price of Burmese rice is lower than that of other exporting

countries such as Thailand and Vietnam because of poor quality. On the other hand, given the relative abundance of land, the average size of holdings is higher than that of other developing countries in Asia, despite the fact that a large share of Myanmar's workforce is in agriculture.[8]⁸

Box 1: Rice production in Myanmar, some findings[9]⁹

Rice production in Myanmar, some findings ? World Bank 2016 & 2019

? **Agricultural productivity in Myanmar is low.** For example, to harvest rice, one day of work generates only 23 kg of paddy in Myanmar, compared to 62 kg in Cambodia, 429 kg in Vietnam, and 547 kg in Thailand.

? **Farm practices are still largely labor intensive.** In Ayeyarwady, farmers spend more than 100 days per hectare on monsoon rice paddy compared to 52 days in Cambodia, 22 days in Vietnam, and 11 days in Thailand.

? **Myanmar has the lowest profits from rice production** compared to those achieved by farmers in Asia's other rice bowls. In 2013-2014, the net margin/profit from producing monsoon rice paddy averaged \$114/hectare.

The heavy emphasis on rice production and government's promotion of intensification thereof also comes with concerns on whether current production methodologies combined with the reality of climate change are environmentally sustainable. Monocropping, indiscriminate use of fertilizer and other agrochemicals (e.g. pesticides) and inappropriate agricultural practices are having negative effects on the environment, such as surface and groundwater pollution and soil degradation.[10]¹⁰

While the most significant crop in the target landscapes is rice, other cash crops are also important sources of income in the delta regions. These include green gram, black gram, chili, vegetables, sesame and betel leaves, as well as small-scale livestock farming, and fishery/aquaculture. These cash crops and other resources harvested from rice-based production systems and landscapes feed into local and national value chains (with potential for sustainable and resilient supply chains); for instance, fish from the Delta and Sittaung system and estuary is marketed to urban centres and exported primarily to Thailand whereas rice and pulses are exported to China, India, Africa, and Europe.

Pulses and beans

In addition to rice, pulses and beans are an important agricultural product in Myanmar: they are cultivated on about 20% of the country's farmland.[11]¹¹ They have an important role to play in raising the levels of human nutrition and in maintaining the environmental sustainability of agriculture.

Growing pulses and beans is economically attractive for smallholder farmers. Once rice has been harvested, the land can be used to grow pulses and beans, so farmers can get another crop out of their land. In Ayeyarwady region, legumes are grown on 32% of paddy cultivated area; in Bago region, it is as high as 67%. Black gram represents 62% of pulses and bean cultivated area in Ayeyarwady and 52% in Bago region. The largest black gram sown areas of the country have been concentrated in Ayeyarwady region, in particular in Maubin, Danuphyu, and Nyaungtone townships. Pulses and beans are the country's largest agriculture commodity export valued at USD 1,046 million in 2016-2017; in 2017-18 the export value was reduced to USD 627 million due to restrictions on the Indian market.[12]¹²

Fisheries/aquaculture

The fisheries and aquaculture sector is vitally important for socio-economic development in Myanmar. Both commercial and traditional fishing as well as aquaculture are significant, providing food/nutrition, income and employment for the local populations. The western part of Sittaung River Basin and Ayeyarwady River Basin are low land plain areas with fertile soil. Some areas along small creeks are deep water flooded areas, in which rice cannot be cultivated well and yields are low. In these areas, farmers use a natural (wild fish) aquaculture system with low yield of fish farming, which is more profitable than paddy cultivation. Integrated rice-fish farming systems are also quite productive and profitable, in most cases producing good yields of both rice and fish while making optimal use of nature-based solutions for crop pest population regulation and crop fertilization[13]¹³.

C. National Climate Trends

Historical trends

The Department of Meteorology and Hydrology (DMH) under the Ministry of Transport and Communication analysed trends in hydrometeorological indicators over the last six decades and identified the following changes.[14]¹⁴

1. Mean temperature has risen by around 0.08°C each decade;
 2. Overall rainfall has mainly risen throughout the country ? although it has fallen in some areas;
 3. There is late onset and early termination of southwest monsoon;
 4. There are more extreme weather events; and
 5. Sea levels are rising.
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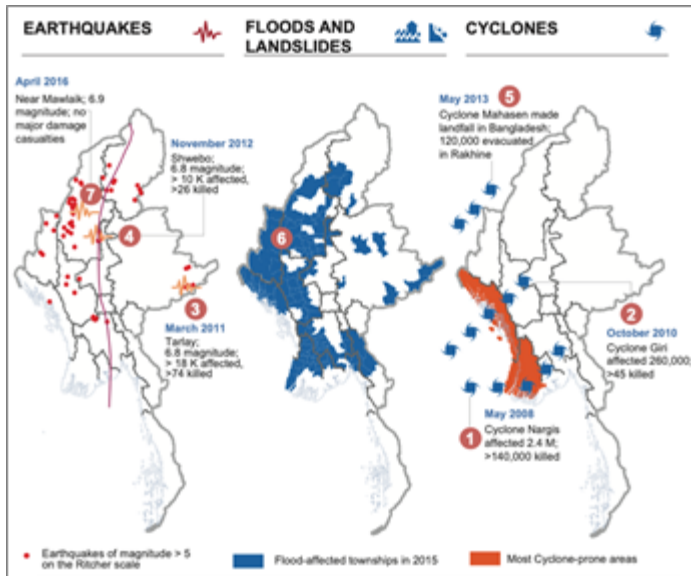


Figure 1: Occurrence of earthquakes, floods, landslides and cyclones in Myanmar since 2005 (OCHA, 2016)[15]¹⁵

Temperature: Coastal and delta regions have an average maximum temperature of 32°C, which increased by 0.23°C per decade between 1981 and 2010. The daily maximum temperature increased by 0.4°C per decade in the same period (DMH, 2016).

Precipitation: A study of 19 DMH weather stations revealed that total annual precipitation increased slightly between 1981 and 2010, by 157 mm a decade in coastal areas and by 37 mm a decade inland (Horton et al. 2016). The late onset and early withdrawal of the monsoon means that its normal average duration has decreased: the average annual duration was 144 days over the 30 years period of 1961-1990, which has decreased to an average annual duration of 121 days over the 30 years period 1981-2010.

Future projections

Temperature: Average annual temperature in Myanmar is expected to rise in the coming century to varying degrees depending on region and time of year. Temperature projections from the NASA Earth Exchange Global Daily Downscaled Projections (NASA NEX GDDP, 2015) find that nationally, temperature will rise by 1.3-2.7°C by the mid-century related to the base period 1980-2005. Analysis by season finds the highest temperature rise by 2050 will be in the hot season (March to May) and cool season (November to February) compared to the wet season (June to October) by 2050 (Horton et al., 2017). Assessment of the number of hot days (38°C in coastal areas) shows an increase from an

average of 1 day per month historically (1981-2010) to between 7 and 17 days per month by the 2050s. This number is highest during the month of April and is expected to see the highest increase in the future.

Precipitation: Precipitation in Myanmar is expected to increase in the wet season in both the near and far future. This could increase the potential for flooding in flood prone areas. Projections for the cool and hot seasons are less certain.[16]¹⁶ Analysis by season shows that by 2050, the range of annual average rainfall in Myanmar is expected to increase by 6-27%.

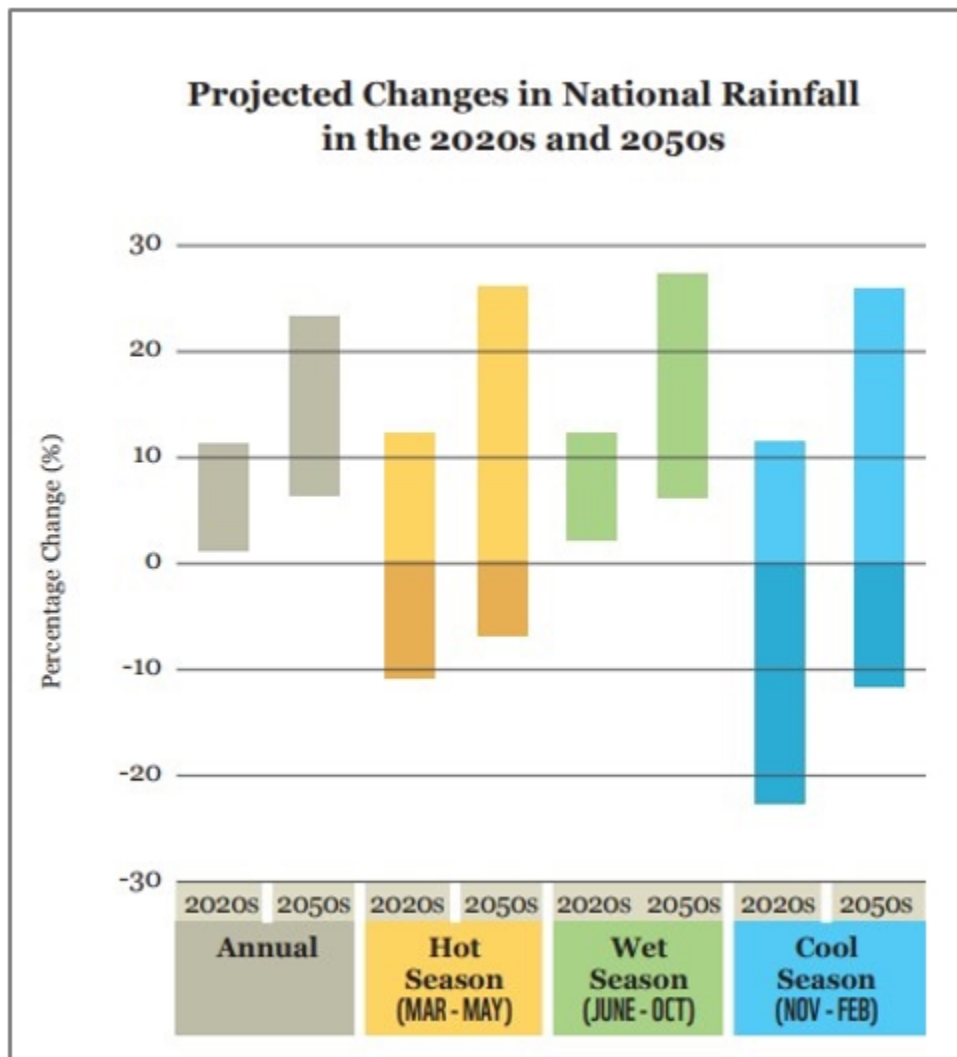


Figure 2: Range of average annual rainfall percentage change (low estimate to high estimate) relative to 1980-2005 base period (NASA NEX GDDP, 2015).

D. Project Site Context

The RiceAdapt project will be situated in the Ayeyarwady Delta and Bago-Sittaung River Basin due to their importance in supporting rice-based resilient agricultural livelihoods. The Ayeyarwady Delta comprises the main arms of Patheingyi, Pyaw, Bogale, and Toe Rivers. It is the main rice-producing region but challenged with intensification, flooding and high population density. Its famed fertility derives from the silt deposited by the Ayeyarwady River as it reaches the end of its 1,200 km (750-mile) journey from Upper Myanmar to the Andaman Sea. The Ayeyarwady Delta is home to 21 million people, with the majority depending on rice production for their livelihood. The average farm size per household is about 4.5 ha, which is the largest in the country. However, the Delta is also the place of many landless people with low levels of income.[17]¹⁷

The Sittaung River rises northeast of Yamethin on the edge of the Shan Plateau and flows south with a catchment area of 48,100 km² for 420 km to empty into the Gulf of Mottama of the Andaman Sea. The broad Sittaung Basin lies between the forested Bago Mountains on the west, and the steep Shan Plateau on the east. The river basin is one of Myanmar's four major rivers and is home to 10% of the population while holding about 15% of the annual surface water potential. Around 30-40% of the population of the Sittaung basin are rice farmers.[18]¹⁸ Livelihoods in the lower Sittaung valley are highly dependent on the natural resource base, especially the wetlands including marshes, mangroves, oxbows and mudflats that characterize the region.

The proposed project areas of the Ayeyarwady Delta and Bago-Sittaung River Basin are considered as the rice bowl of Myanmar. The rice ecosystems of the targeted landscapes are generally dominated by rainfed lowland rice although deep-water rice cultivation is also practiced in the delta region.

The delta occupies three regions: Ayeyarwady, Yangon, and Bago where most areas are favourable for rice cultivation. In general, the delta area has one of the wettest climates in Myanmar, but it is highly seasonal, with the majority of rainfall in the monsoon months from June to August and a significant dry period from December to April. The reliability of seasonal monsoon rainfall and subsequent river flows is also critical to livelihoods and agriculture production in the delta, both irrigated and rainfed. Due to limited or degraded water resources management and storage infrastructure, like dams and irrigation systems, high dependence on seasonal flows also means increased high vulnerability to shifting rainfall patterns and a shortening monsoon season that are both making flows less reliable and increasing exposure to hazards like droughts and floods.

Rice is mostly grown in the middle and upper part of the delta, near rivers and small dams. Planting season starts in June-August for the monsoon paddy which is harvested in November-January while the summer paddy is from November-December to April-May. While some areas in the delta are prone to flooding in the monsoon, some are affected by salt intrusion toward the end of monsoon and during the summer season. There is limited fresh water available in most parts of the lower delta during summer.

Site selection

Within the proposed target area, six target townships (Kyaiklat, Maubin and Wakema in Ayeyarwady, and Kawa, Thanatpin and Waw in Bago) were selected based on a set of criteria established in consultation with stakeholders. These criteria included:

- a. Presence of other projects / co-financing (but avoid overlap with other GEF investments)^[19]¹⁹;
- b. Vulnerability to climate change (storm and strong wind, flood, saline water intrusion, summer drought);
- c. Significant area of both monsoon and summer rice cultivation;
- d. Potential for cultivating other crops, diversification (including, for instance, pulses, vegetables, rice-fish, rice-shrimp);
- e. Balance between most vulnerable/least developed, but also townships with higher capacity to test/scale out innovative solutions;
- f. Balance between different ethnic groups; presence of female-headed households and at least 50% female population;
- g. Practicability (access/infrastructure for market-based solutions, townships close to each other, etc.);
- h. Suitability for project interventions (in line with outputs from PIF).

Selected townships and areas of monsoon/summer rice

District	Township	No of village tracts ^[20] <small>20</small>	No of villages	Monsoon rice (acres)	Summer rice (acres)	Population (2014)
Pyapon	Kyaiklat	87	421	132,692	127,609	193,340
Maubin	Maubin	76	442	222,703	141,276	314,090
Myaungmya	Wakema	125	581	213,216	118,136	289,110
Bago	Kawa	89	175	193,497	7,475	197,360
Bago	Thanatpin	60	99	150,235	29,432	145,290
Bago	Waw	54	117	173,202	19,449	176,010

Within these townships, a pre-selection of 15 target villages per township (total of 90 core and outreach villages) was made based on a set of agreed criteria similar to the above. These are yet to be confirmed with relevant stakeholders during the project's inception phase.



In the Ayeyarwady Delta, a range of rice varieties have been introduced for cultivation including traditional quality, salt-tolerant, deep-water, waterlogged and submerged rice varieties. Varieties such as *Pawsan Hmway*, *Pawsan Baygyar* and *Phyarpon Pawsan* are highly valued and cover approximately 20% of the Delta region.[22]²² The sown area of rice in Ayeyarwady region is shown in Figure 3.

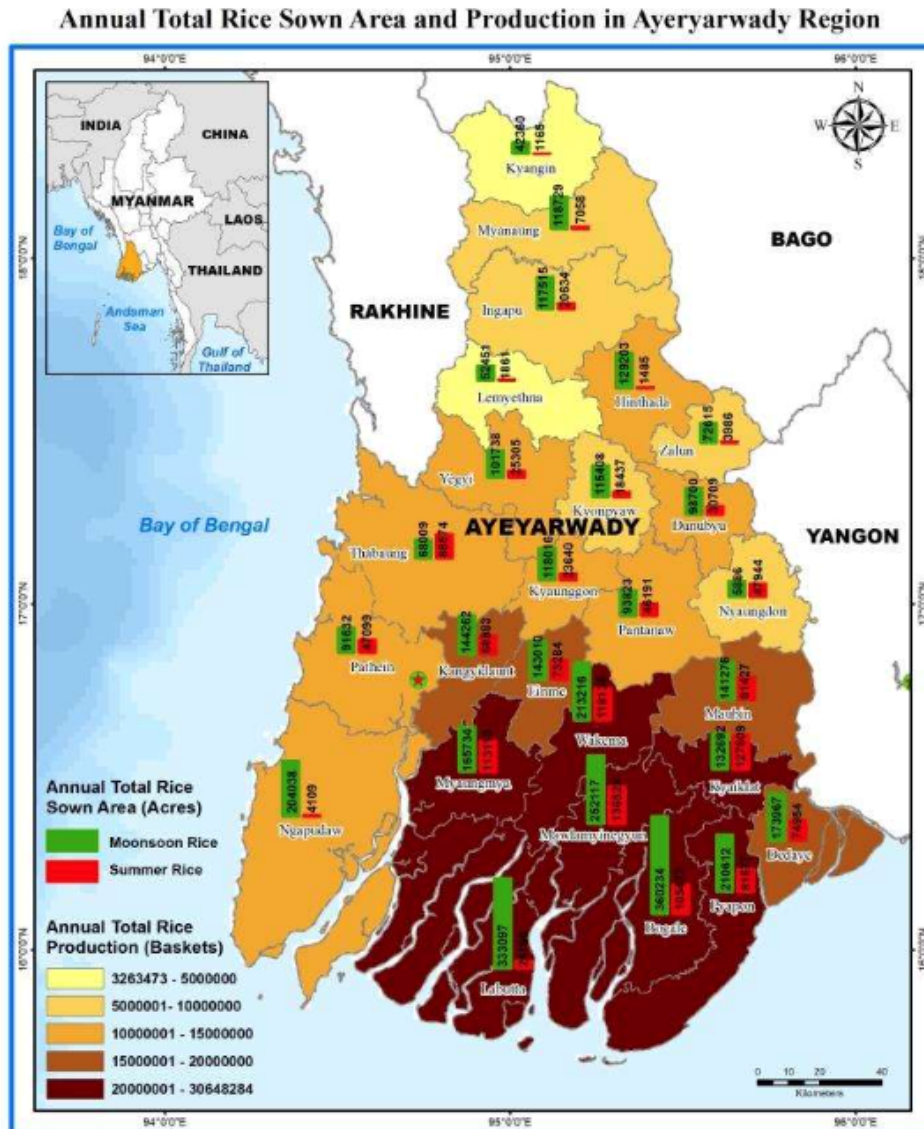


Figure 3:

Sown areas of rice in Ayeyarwady region (Source: WHH/MOALI/MRF, 2019)

When accessible to farmers, the major agro-inputs used in rice production are seeds, chemical fertilizers, bio-fertilizers, pesticides, tractors, threshing machines and fuel oil for machines. Farmers mainly purchase fertilizers and pesticides from the agro-chemical stores in village and township markets.

The construction of polders provided with embankments, sluice gates, and drainage systems protects the rice farms from floods and salt water intrusion (as shown in Figure 4 for Ayeyarwady region)^[23]²³. However, the lack of proper maintenance along with weather impacts have damaged many of the polders, resulting in the uncontrolled entry of salt water and, thus, reducing rice yield. Many of the damaged rice areas remain prone to salt water intrusion even in the monsoon season. Many polders and dykes were destroyed by Cyclone Nargis in 2008 and barely reconstructed afterwards. The low level of water management has additional negative impacts in that it (i) prevents mechanization due to limited access to flooded land, and (ii) prevents the development of alternative summer crops such as vegetables (e.g. chili peppers) and/or pulses (cowpea, green / black gram, etc.) that cannot cope with water intrusion. The irrigation facilities in Ayeyarwady and Bago regions are shown in Table 1 below.



Figure 4: Embankments (red lines) in Ayeyarwady Region[24]²⁴

Table 1 Completed irrigation facilities in Ayeyarwady and Bago regions

State/region	Dam	Weir	Tank	Sluice	Pump	Groundwater	TOTAL
Ayeyarwady	6	1	-	79	17	-	103
Bago	39	13	-	14	23	-	89
Myanmar total	235	107	71	168	208	3	792

Source: IWUMD, MOALI (2019)

Part of the project area in Bago Region (namely, Thanatpin township) is representative of deep-water rice area in Myanmar. It is one of the typical flood-prone and deep-water areas due its location beside the Bago-Sittaung canal and total annual rainfall of about 3,300 mm. Farmers have adopted a traditional method of rice cultivation practice well-suited with their specific land condition.

In the target regions, rice is practically the only crop that can be cultivated in the monsoon season under current flow and drainage conditions. After harvesting the first crop, farmers in the target townships either grow summer paddy (if they have access to irrigation), or pulses such as green gram or black gram as second crops. The decreased water requirement makes many pulses the ideal crop to rotate with rice in the drier months. In Wakema Township, triple cropping patterns could also be found, as shown in Figure 5.

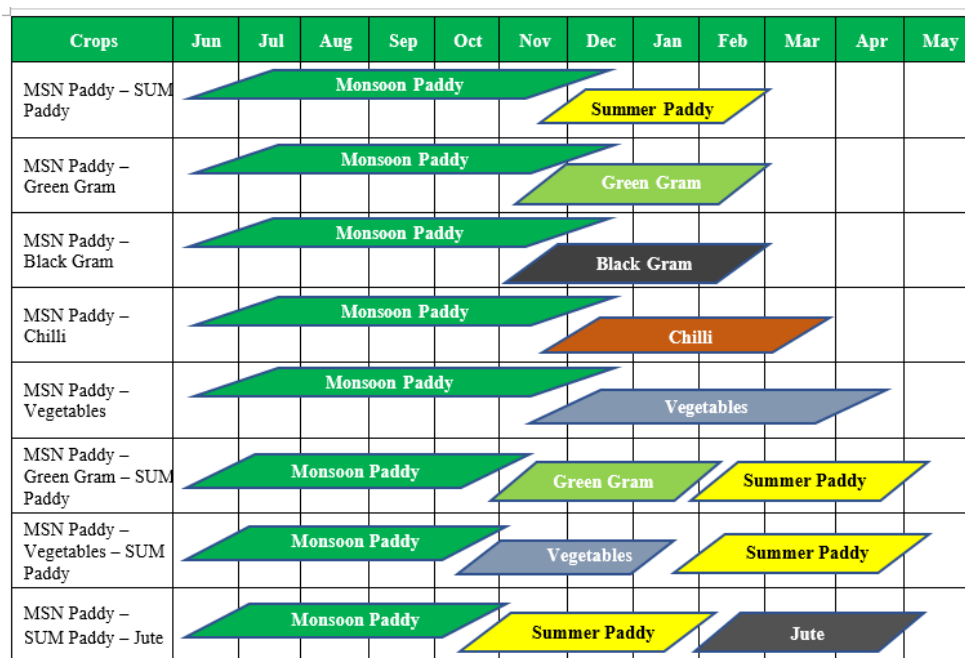


Figure 5: Cropping Patterns in Wakema Township, Ayeyarwady Region[25]²⁵

The table below shows the major crops grown in the target areas (example from Thanatpin township[26]²⁶).

Table 2 Production of major crops in Thanatpin Township, Bago Region

No	Crop	2017-2018			
		Sown (ha)	Harvested (ha)	Yield (kg/ha)	Production (ton)
1	Paddy summer/ monsoon	11,863	9,241	4,538	41,830
		61,587	61,587	3,830	236,093
2	Groundnut	1,266	1,266	1,723	2,165
3	Mung bean	959	959.1	1,499	1,438
4	Green gram	46,095	46,095	1,834	84,545

Socio-economic information

Main livelihoods of the target population in both regions are agriculture and farm labour, fisheries, and domestic and international migration such as for factory workers. Poverty headcount in Bago Region is relatively low with 17% (compared to the national average of 24.8%). In Ayeyarwady Region, almost one third of the total population earns under the national poverty line -1590 kyats per day.[27]²⁷ Literacy rate in the target townships is between 91 and 99%.

Tenure: In Myanmar all the land belongs to the Nation. Farmers can obtain Land Use Certificates. Inhabitants in almost all rural areas in Myanmar are divided into tiller's right holders and landless people. Almost all tiller's right holders in the delta are into paddy cultivation by employing farm workers except those who own tiller's right of smaller areas. The average farm size per household in Ayeyarwady Delta is 11.2 acres (some 4.5 ha) according to UNDP (2007), which is ranked first among the Union in terms of farmland size per household. It is probably because the settling of immigrants in the delta started only around 100 years ago, so that it was not difficult for people to expand their lands. However, due to the high rate of population increase, the ratio of landless farmers in the delta has also increased. Some people lost their land tiller's right to cover school expenses or medical payment.[28]²⁸

A JICA (2011) survey shows that in the area around Labutta the ratio of households which have the tiller's right on farm land falls between 39.7% of villages in Kyaiklat Township and 22.6% of villages in Bogale Township (70% at the maximum and 9.9% at the minimum at village level). The majority of households are landless farm workers, accounting for over 50% of rural households on average.[29]²⁹

Landless: In Myanmar's rural areas, a high proportion of the landless population are traditionally linked with farmers as farm labour. More recently, however, these linkages seem to be weakening, which accelerates rural change dynamics. For rural households, the emergence of new industries and increased urbanisation creates new opportunities outside of the agricultural sector; while agricultural development schemes are encouraging more intensified agricultural production and mechanisation. Data shows that only a small percentage of landless households in either region rely on agricultural labour alone. Instead, a shift can be observed towards more diverse livelihood portfolios and non-farm works.[30]³⁰

Labour shortage arise in the peak season of crop production activities (e.g. crop establishment, weeding and harvesting) as an increasing number of farm labourers have moved to cities for better-paid jobs. The way out of the labour shortage is farm mechanization that reduce the labour requirements. However, farm mechanization levels are currently still very low.[31]³¹

A survey conducted in the Ayeyarwady Delta and Central Dry Zone showed that only a small percentage of landless households in either region rely on agricultural labour alone. Instead a shift towards more diverse livelihood portfolios and non-farm works was observed. This creates a labour shortage in crop production but only a small percentage of farmers in both regions own the farm machines. Most of farm machines used are able to substitute animal power whereas transplanting and harvesting crops still largely relies on human labour. The private sector has filled that gap in recent years with a range of small-scale mechanization options now available for hire and with services easily booked through a smartphone-based application[32]³².

Environment and biodiversity

The Ayeyarwady Delta comprises the main arms of Patheingyi, Pyawon, Bogale, and Toe Rivers. It is famed for its fertility from the silt deposited by the Ayeyarwady River as it reaches the end of its 1,200 km journey from upper Myanmar to the Andaman Sea. The Sittaung River rises northeast of Yamethin on the edge of the Shan Plateau and flows south for 420 km to empty into the Gulf of Martaban of the Andaman Sea. The broad Sittaung Basin lies between the forested Bago Mountains to the west, and the steep Shan Plateau to the east (Figure 6).

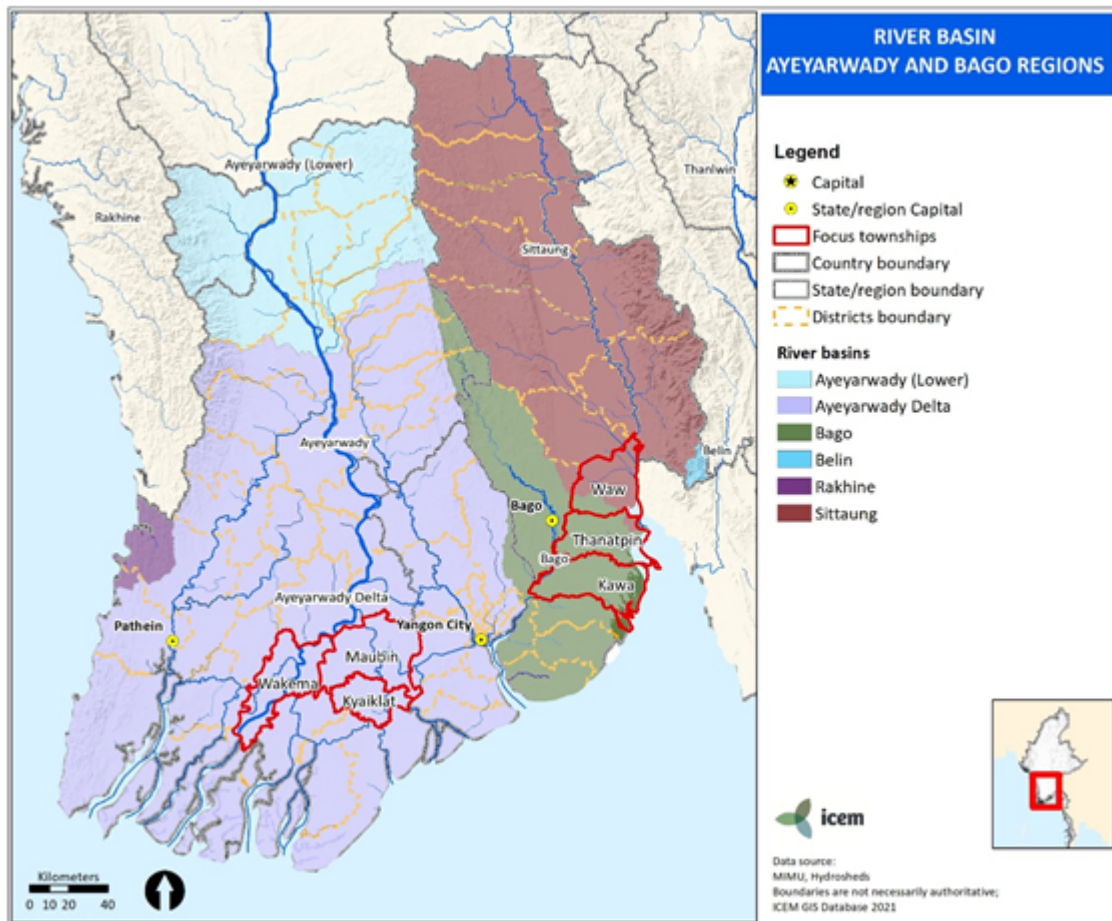


Figure 6: River basins in Ayeyarwady and Bago regions (ICEM, 2021)

The project target townships in the Ayeyarwady Delta are in a region originally covered by Irrawaddy freshwater swamp forests that have almost been completely converted to cropland (mainly rice), with some key biodiversity marshes and other wetland areas remaining in Maubin (Figure 7). There are no fully protected areas in the ecoregion. The small stands of forest remaining are equally divided between closed and open forest; however, the stands are highly fragmented. Common tree species include Teak (*Tectona grandis*), Mai maeng (a variety of *Xylia xylocarpa*), Cotton-tree (*Bombax ceiba*), Kajaw (*Millettia pendula*), Wild mango (*Spondias pinnata*), Bahera (*Terminalia balerica*), and Bamboo (*Melocanna bambusoides*). The Ayeyarwady Delta also previously contained significant areas of mangroves, but these forests are now severely degraded mainly due to commercial timber extraction, charcoal production and expansion of rice fields. The region remains an important wetland for migratory birds, however, with Maubin Township, in particular, containing many water bodies and ponds that provide habitat for multiple species, including the critically endangered Spoon-billed Sandpiper (*Eurynorhynchus pygmeus*) and near-threatened Black-tailed Godwit (*Limosa limosa*).

E. Climate-related vulnerabilities of target areas

a. Exposure

The Ayeyarwady Delta and Bago-Sittaung River Basin experience a monsoonal climate with average annual precipitation of about 2,500 mm in the southeast and 3,500 mm in the southwest. The maximum and minimum temperatures are about 37°C and 22°C. The frequency of cyclones and accompanying strong winds, storm surge, floods or inundation, intense rains, extreme temperatures and sea-level rise exhibit the high exposure to climate change-related impacts in the region. The targeted regions are not only impacted by floods, intense rains, cyclones and increased temperatures, but are also exposed to increased salinity, coastal erosion, and inundation as a result of sea-level rise.

Temperature. Future changes of average annual temperature in the target regions are projected about 0.1°C-1.8°C (2020-2044), and 0.8°C-3.6°C (2075-2099). It is projected that the highest average temperature will be about 31.5°C (Ayeyarwady), 31.6°C (Bago) and 32.4°C (Yangon) in the month of May during the 21st century (Myo et al., 2019). Maximum temperature in April is projected to increase, as shown in Figure 10.

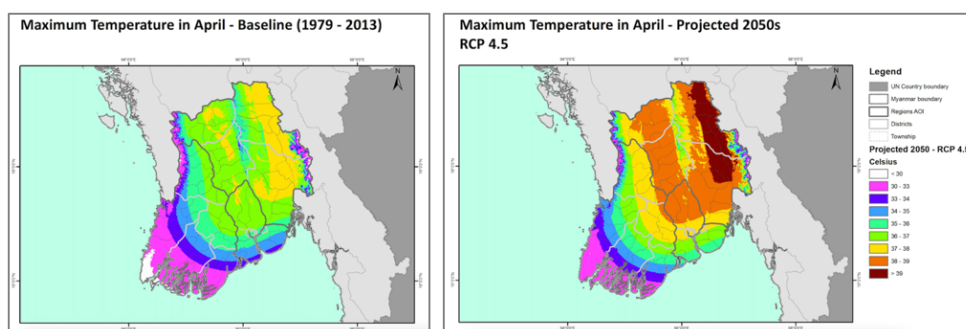


Figure 10: Projected temperature change (maximum temperature in April) for Ayeyarwady, Bago and Yangon regions. Baseline and projected 2050 (RCP 4.5) Source: FAO (2020)

Precipitation. In the Ayeyarwady Delta, monthly changes from station data (DMH) show that the pre-monsoon and monsoon rainfall will increase and post-monsoon rainfall will decrease significantly in both future periods. The average annual precipitation in the Delta increases in the future periods compared with the baseline period (1981-2005) (Myo et al., 2019). The projected increase in annual precipitation is also shown in Figure 12.

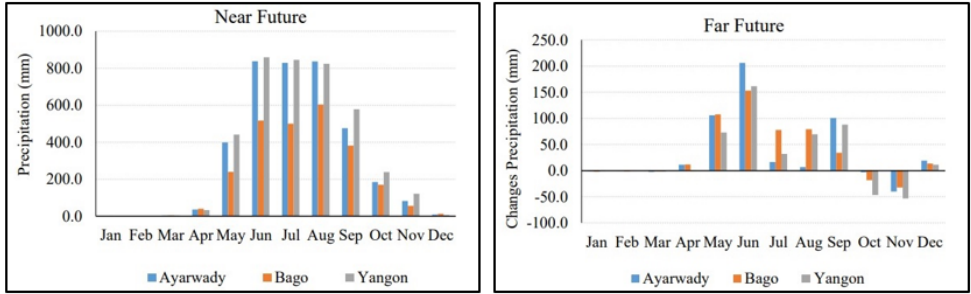


Figure 11: Average monthly precipitation for three regions in the near and far future (DMH)

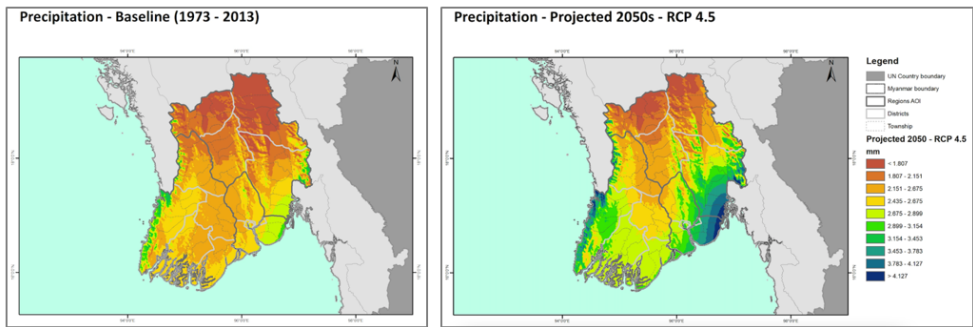


Figure 12: Projected annual precipitation change for Ayeyarwady, Bago and Yangon regions. Source: FAO (2020)

Site-specific climate reports generated under climateinformation.org for the target townships (example below from Maubin) illustrate the potentially very large increase in annual precipitation, water discharge and water runoff.

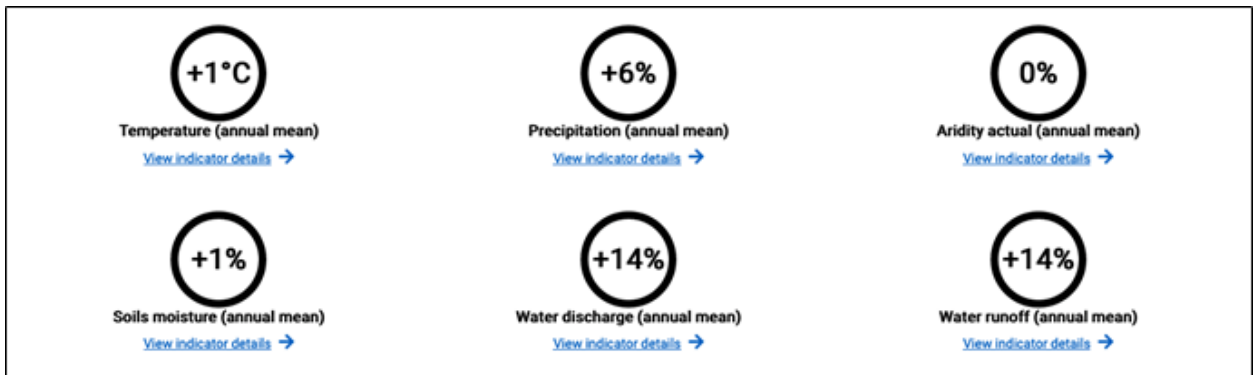


Figure 13: Site-specific summary climate report for Maubin township: projected changes for the period 2011-2040, RCP 4.5 (climateinformation.org)

Sea level rise and saline water intrusion: Projections of sea-level rise along Myanmar's coast range from 5-13 cm by 2020 and 20-41 cm by the 2050s (Figure 14). By the 2080s, sea level rise is projected between 37 and 83 cm, with estimated values as high as 122 cm. Rising sea levels in the Ayeyarwady Delta and Bago-Sittaung River Basin will lead to saltwater intrusion into groundwater that is particularly vulnerable to saline intrusion during the dry season as a result of low water volumes in river systems of the Delta. If sea level rises by 0.5 meters, the shoreline on the Ayeyarwady Delta would move inland by 10 kilometres, with a significant impact on local communities, agriculture, and potable water resources. (Horton et al., 2017)

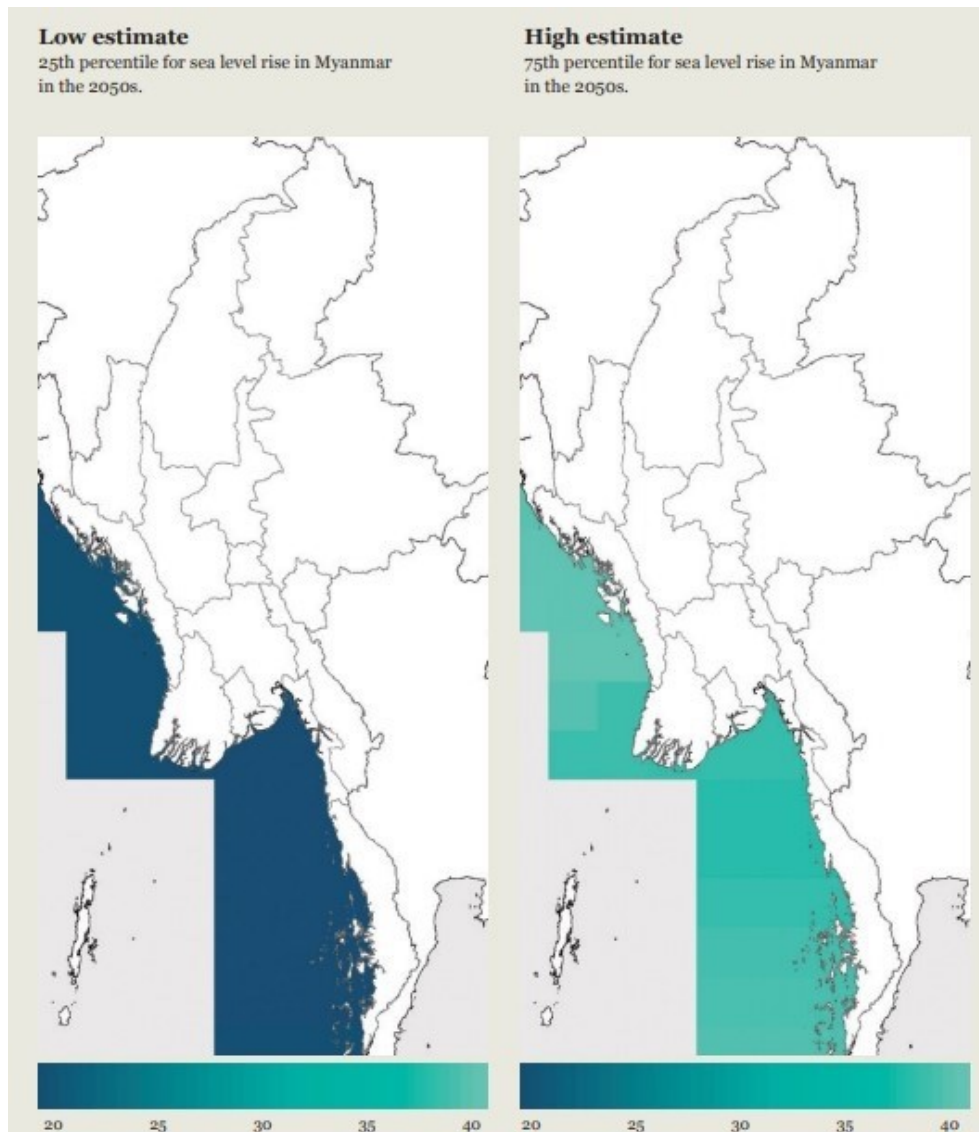


Figure 14: Projected sea level rise (cm) along the coast of Myanmar in the 2050s relative to the 2000-2004 base period (Horton et al, 2017)

The major causes of salinity in the delta region were sea level rise and the seasonal tidal regime. In the delta area, the mean tidal level as well as the spring tide level fluctuates seasonally. Spring tides are highest in summer season leading to strong seasonal salinization. Consequently, the rice growing areas in the delta are not completely protected against a periodic saltwater intrusion even in rainy season. According to the record from DMH, the flow of saline water into the inland part of the Labutta was increasing significantly, especially in 2009, 2010 and 2012 due to sea level rise, seasonal river runoff and flooding after serious impacts of Cyclone Nargis in 2008. In the target areas in Ayeyarwady, Wakema township has salt-affected rice areas due to brackish water; Maubin and Kyaiklat, in turn, do not have serious salt affected-areas. In Bago region, the three townships of Waw, Kawa and Thanatpin also have salt-affected areas.

Extreme weather events: Myanmar is increasingly exposed to severe hydro-meteorological events, including cyclones, floods and heavy rains, and slow onset disasters including droughts. In addition, extreme temperatures are becoming more frequent and the consequences more severe.[37]³⁷ Cyclone Nargis severely affected the country's agriculture sector with losses equivalent to 80,000 tons and damaging 251,000 tons of stored crops, across 34,000 hectares of cropland.[38]³⁸ Myanmar will likely see an increase in the number and intensity of cyclones, strong winds, floods, storm surges, intense rains events.[39]³⁹

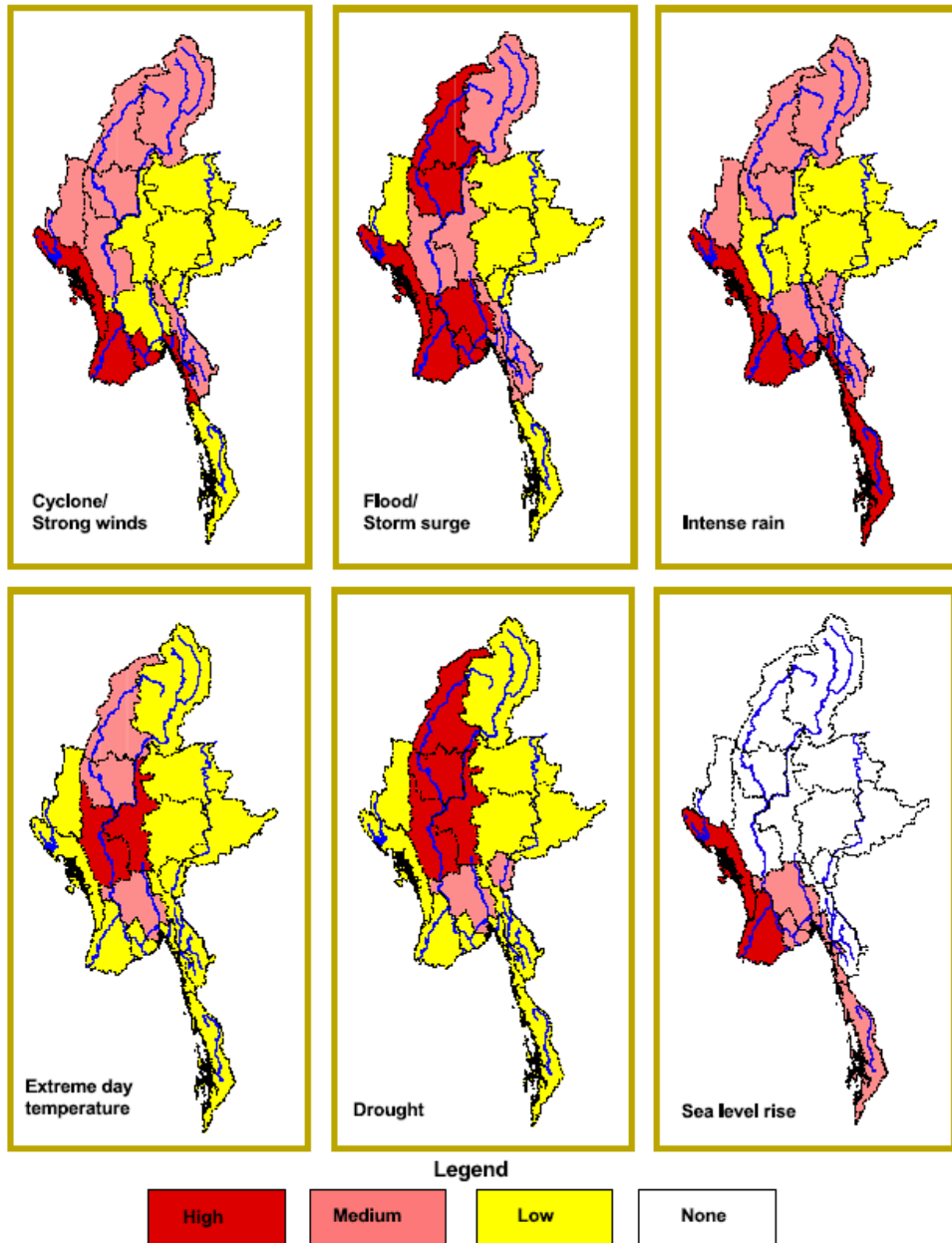


Figure 15: Vulnerability of areas and Regions/States in terms of different climate hazards (map source: Myanmar NAPA 2012).

In July 2015, cyclone Komen caused extensive flooding to agricultural land, which remained submerged in some areas until September. This caused severe localized losses to the 2015 monsoon season crops, especially paddy, in Chin, Rakhine, Ayeyarwady, Yangon, Sagaing and parts of Bago. However, once the water receded, a large portion of the flooded areas with paddy was replanted. Livestock and fisheries were affected by the flooding in localized areas with losses of cattle, buffalo,

sheep, goats, pigs and poultry, and damage to fish and shrimp farms, resulting in reduced animal protein intake in the most affected areas.[40]⁴⁰

A Multi Hazard Risk Assessment conducted in 2011 of areas affected by cyclone Nargis showed that Patheingyi, Myaungmya, Maubin, Pyawon and Western Yangon districts appeared to be at particularly high risk of flooding. Composite risk for the rice crop was analysed in conjunction with building loss. The results indicate that the Central delta region of Ayeyarwady, particularly Myaungmya district, appears to be at high risk (see Figure 16).[41]⁴¹ Similarly, a Climate Change and Disaster Risk Assessment conducted for the Resilient Community Development Project (RCDP) showed that the Ayeyarwady cluster presents the highest risk of disasters triggered by multiple hazard; as well as environmental and socio-economic conditions that will enhance the negative effects of climate change. This should prompt township authorities, village administrators, communities and the RCDP project to ensure that infrastructure and livelihood actions are adapted to the high risk of strong winds and cyclones; inundation; storm-surge and waves.[42]⁴²

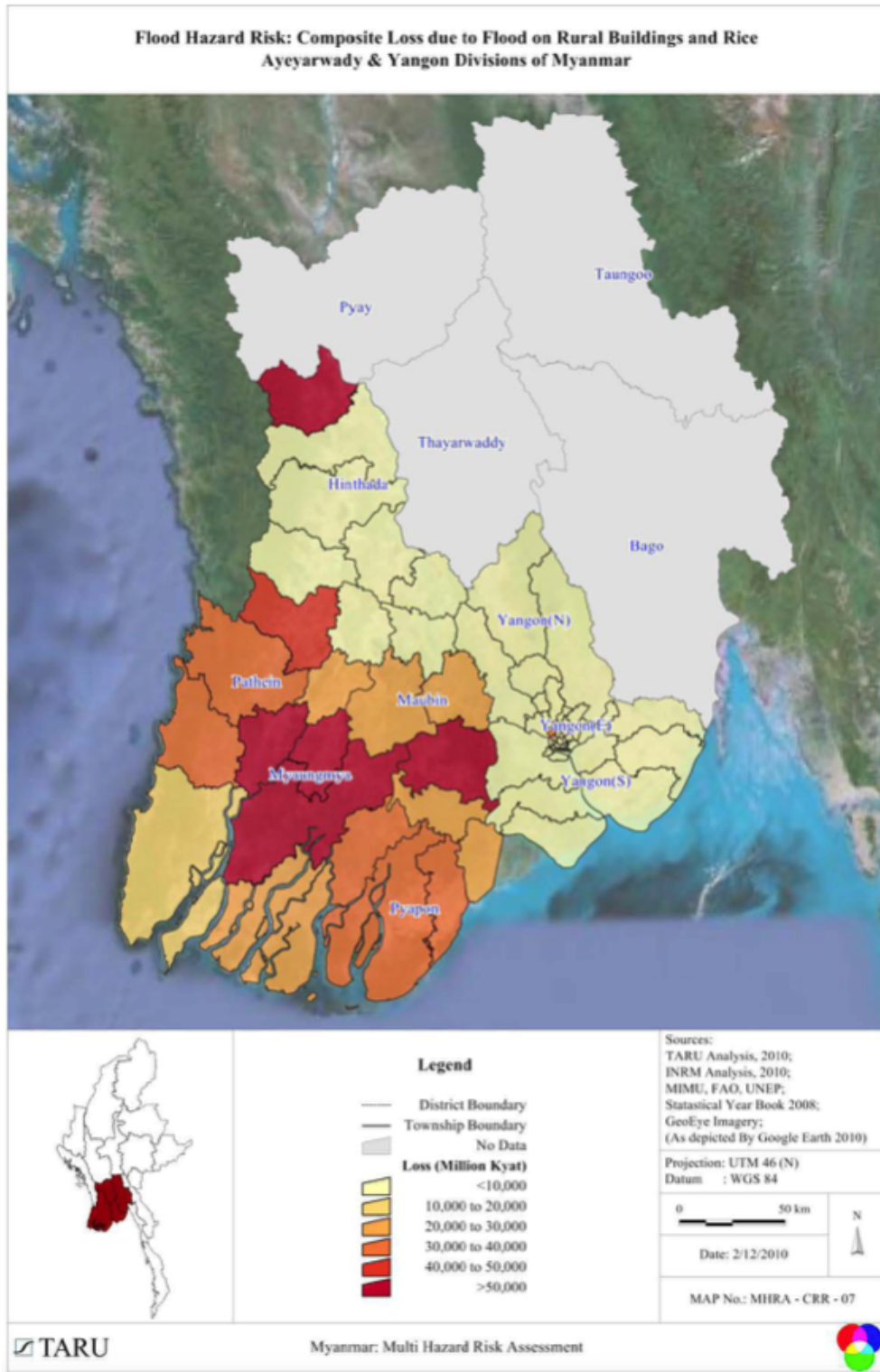


Figure 16: Composite Risk Map: Flood impact on buildings and rice (UNDP, 2011)

In the Gulf of Mottama and its tide-dominated coastline, erosion and saltwater intrusion are driving a decrease in agricultural land.

Impacts on groundwater: Groundwater aquifers in the river basins are recharged mainly by rainfall but also controlled by temperature through evaporation from surface water bodies. Temperature affects groundwater systems by reducing the amount of water available for groundwater recharge. Projected increases in temperature in the river basins, in particular outside of the wet season, will reduce groundwater recharge and impact water availability in the basins.

b. Sensitivity

As described above, the lower parts of the Ayeyarwady and Sittaung River Basin are highly vulnerable to the effects of climate change and extreme events, including cyclones and strong winds, floods and storm surges, intense rains, and sea level rise. Agricultural production, particularly that of rice, is one of the most important areas of high vulnerability to climate change across the targeted landscapes.

Rice-based farming communities in Ayeyarwady and Bago regions are particularly sensitive to these climatic trends for several reasons. First, these communities are reliant on climate-sensitive livelihood activities in agriculture (including crops, fisheries and livestock), where they are engaged as either farmers or farm labourers, or in related businesses. In 2014, 70% of the total rural population in Myanmar depended on rainfed agriculture, livestock and fishery and forest resources. It is clear that the livelihoods and wellbeing of a large part of the population are highly sensitive and vulnerable to climate change, climate variability and natural disasters.[43]⁴³ A vulnerability assessment conducted in Labutta township in the Ayeyarwady region in 2017 showed that an insufficiently diverse economy increased climate sensitivity.[44]⁴⁴ Agricultural impacts will particularly affect low-income rural populations that depend on traditional agricultural systems or on marginal lands.

Second, the rice sector is particularly sensitive to changes in rainfall patterns given that the majority of rice cultivation is rainfed. Hydro-meteorological hazards have affected rice production in many regions in Myanmar, and are probably the main triggers of food insecurity.[45]⁴⁵ An increase in the frequency and severity of extreme weather events is expected to affect rice yields, and thus impacting GDP and household income.[46]⁴⁶ In the Gulf of Mottama, saltwater intrusion is especially acute in the dry season, resulting in low productivity and, often, the total loss of paddy fields. Extreme daytime temperatures can also directly affect crops and livestock. Additionally, climate change impacts occur at various stages of the rice value chain, including during production, post-harvest and storage. In particular, storage infrastructure and rice harvests or seeds are affected by floods and heavy rains.

Finally, agricultural systems in the target areas lack diversification (in part due to the climatic conditions), which further increases sensitivity.

Impacts on rice yield: The late onset of monsoon delays the paddy crop planting. This could reduce crop yield while the early withdrawal of monsoon could reduce crop productivity.^[47] Future rice yields in Myaungmya township (located to the west of Wakema township) were estimated using the EPIC model. Results find a general increase in yield of early (monsoon) rice that can be estimated for all future periods with an increase of 11.84% under RCP4.5 and 7.56% under RCP8.5. However, a significant decreasing trend of late (summer) rice yield of 37.32% under RCP4.5 and 50.89% under RCP8.5. The study also suggests that changing the sowing date is a good option for compensating future rice yield reduction. In addition, providing the information and services including pest, drought, and weather forecast as well as extension systems will help rice farmers respond to climate change.^[48]

An analysis conducted by FAO during the preparation phase of the RiceAdapt project using the Global Agro-Ecological Zoning (GAEZ) approach shows a projected decrease in suitability of rainfed rice in the project regions (Figure 17). In both RCP 4.5 and 8.5 scenarios, around 50% of rainfed rice production shifts from 'high' (suitability index > 63) to 'good' suitability (suitability index > 50). Similar projections also apply to legume crops (FAO, 2020).

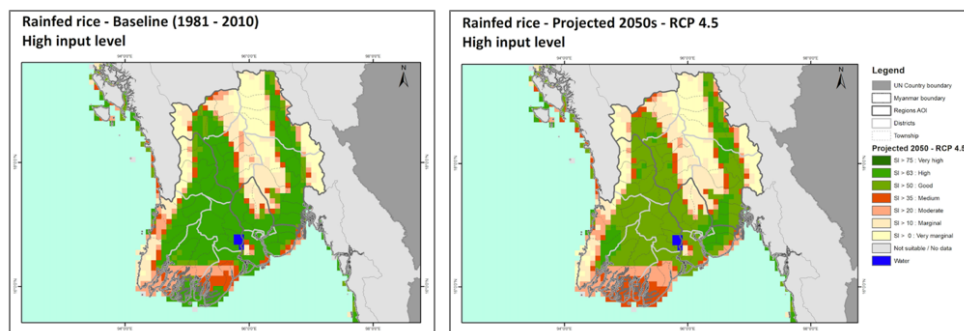


Figure 17: Rainfed rice suitability baseline and projected 2050/RCP 4.5 (FAO, 2020)

The analysis also highlights a shift in growing season, as shown below. This potentially implies that shorter-duration varieties will become even more important in the future.

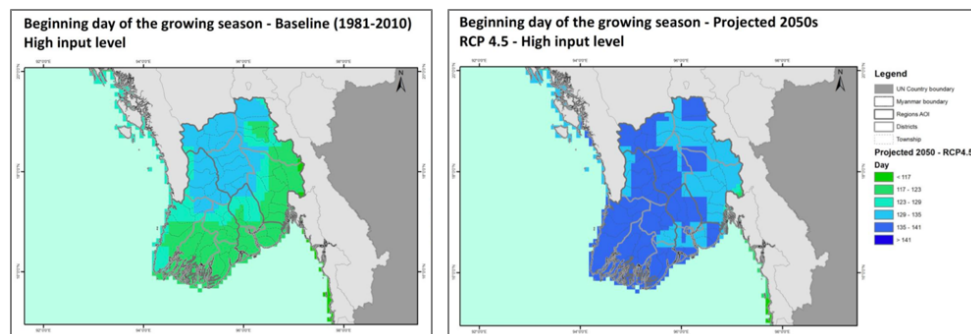


Figure 18: Projected changes in the beginning day of the growing season (FAO, 2020)

Pests and diseases: On the other hand, due to the increased incidence and severity of climate change related events, such as extreme temperatures, drought, flood, intense rains, and cyclones, the resiliency of crops and associated crop compensation capacity for incurred damage is reduced. This is expected to result in increased incidence and severity of pests and disease outbreaks and associated damage and yield loss. Additionally, it may lead to maladaptation such as increased pesticide spraying. During the 2018 Southeastern Myanmar floods, a number of townships (e.g. Bago, Nyaunglebin and Hpa-an) in Bago region and Kayin State have reported the occurrence of Golden Apple Snails (*Pomacea canaliculata*), which is an invasive pest species, and relatively new in these regions/states. The exotic snail feeds on rice during the early crop growth stages when rice fields are flooded. It is believed to have been carried and introduced by the floodwaters from the upstream areas of Myanmar. Since these are new pests to these Southeastern Myanmar communities, rice farmers are not aware of appropriate/effective management practices resulting into considerable crop loss and sometimes requiring farmer action to replant crops.[49]⁴⁹ Several outbreaks of Brown Plant Hopper (*Nilaparvata lugens*) were also noticed after Nargis with different level of severity. Further assessment of risks due to plant pests and diseases is required as to strengthen pest and disease early warning systems. Due to the intensive farming in large areas and continuous cropping without fallow periods, pest and disease infestation can become a serious issue with potential negative impact on productivity of the crops. The associated increased use of pesticides can cause secondary outbreaks of crop pest insects, such as Brown Plant Hopper, resulting from breakdown of natural biological control systems. In general, natural biological control systems are robust and keep Brown Plant Hopper populations under natural population regulation (under various climatic conditions/scenarios) assuming natural enemies are not eliminated resulting from indiscriminate use of pesticides[50]⁵⁰.

Impacts on ecosystems and biodiversity: Future climate change will exacerbate these current impacts with increases in extreme weather events such as cyclones, floods and extreme temperatures negatively impacting ecosystem functioning as well as species compositions, distributions and richness. An increase in extreme heat days and drought periods, as well as rising sea-levels, will change quality and

the chemical composition of water resources. This is likely to impact freshwater biodiversity. Impacts will result in cascading effects whereby failure or changes in certain species or functions within an ecosystem will have knock-on effects on other species and functions. This has the potential to result in large-scale loss in biodiversity and related ecosystem services.[51]⁵¹

c. Adaptive capacity

Myanmar has laid important foundations to build adaptive capacity through its national climate change policies and strategies. However, this has not yet been translated into widespread action at the sub-national and local levels. Low levels of adaptive capacity hinder the ability of farmers to increase their resilience to flooding, extreme events and changes in climate. Technologies for adaptation are not yet adopted at a significant scale. The main source of information on agricultural technologies are nearby farmers, followed by radio/TV media, and the Department of Agriculture (DOA) (RiceAdapt baseline studies, 2020). Although mobile phone coverage has increased significantly over the last decade, many of the targeted rice-based communities still lack access to internet as well as web-based approaches and smartphones.

Access to weather/climate information/early warning: Weather forecasts and early warning systems to reduce climate change impact in agriculture are important but are still limited in Myanmar. The majority of farmers agree on the importance of having access to weather information and several sources are available to them, including more recently through mobile apps. However, most farmers are not familiar with the use of mobile apps for weather information. Also, more advanced, seasonal weather information is often not available to farmers. An assessment conducted in Southeastern Myanmar after the 2018 floods found that the lack of access to flood warning or forecast information resulted in significant losses in agriculture inputs and capital with farm households having to replant paddy up 2 to 3 times only to be again destroyed by recurring floods.[52]⁵²

Socio-economic factors: Socio-economic factors such as the low levels of income, high percentage of landless, and low levels of education exacerbate these climate change impacts in the target areas. Because of a lack of vocational trainings and technical skills, people migrating may struggle to secure adequate employment abroad or in larger Myanmar cities. Women are, and further will be, disproportionately affected by climate change as they already suffer from lower wages and lack of opportunities.[53]⁵³ About half of the general population in the project areas are landless, including those working as labourers in agriculture. Access to land for agriculture is often not available to poorer households, as the registration system can be prohibitively expensive for low-income families.[54]⁵⁴

Farmer and community organization: Importantly also, there is limited organization in farmer groups, cooperatives or other community groups in the target areas. Farmer associations, seed producer groups, water user groups, village mechanization committees, etc. could significantly help strengthen resilience of farmers. It would also help increase their capacity for collective marketing, access to inputs and service provision, etc. Under the UNEP/SRP/Helvetas Climate Smart Rice Project, Water Users Group Associations (WUGA) and Water User Groups (WUG) were reorganized and trained on Water Stewardship.[55]⁵⁵

Existing adaptive practices: Nevertheless, some adaptive practices already exist, either introduced by farmers themselves or promoted by government and NGOs over recent years. All of the farmers interviewed as part of a study conducted by the RiceAdapt project design team had recognized a change in climatic condition over at least the last three years. Farmers have started to adjust their agricultural practices such as through (1) using early maturing varieties, (2) adjusting the planting time depending on the weather condition, (3) using the most suitable varieties such as traditional flood-resistant varieties, (4) increasing use of farm machinery for land preparation, transplanting, harvesting, and transporting, (5) irrigation during periods of drought, and (6) digging of the sediment deposited in streams and canals to drive out the flooded water in the rainy season. Regarding crop diversification, farmers perceive that it is an important strategy for climate change adaptation and increased income. However, due to the limitations given the prevailing national rice priority policy, other potential cash crops are not encouraged, particularly in irrigated areas.

A study conducted in Labutta township highlighted the following existing agricultural adaptation practices to offset the rainfall variability and salinity:[56]⁵⁶ (1) Selection of crop variety (use of short-duration rice varieties, use of salt-tolerant varieties); (2) Soil fertility management practices (growing legumes after monsoon rice, application of gypsum, application of compost/manure); and (3) Water management practices (intermittent flooding, desalinization, building small embankment). A study in Pyapon township identified additional coping strategies of farmers to salinity, including:[57]⁵⁷ (1) Early sowing; (2) Low input technology. Farmers use broadcasting method to reduce the costs of uprooting and transplanting seedlings; (3) Use of multiple salt tolerant varieties; and (4) Building of embankments and dikes to protect fields from sea water intrusion.

Irrigated farming system: Irrigation systems in lower Myanmar are mainly targeting the summer rice production since these areas have sufficient monsoon rains and no irrigation is required for monsoon rice production. Bago and Yangon regions have irrigation schemes (dams/reservoirs), while Ayeyarwady Region has embankments/polders particularly for water retention and drainage. Most of them were constructed more than thirty years ago and these facilities are often damaged by floods and cyclones. Moreover, with the very limited maintenance, the majority of the irrigation systems are ineffective to fulfill their operational capacity.

Access to finance. Most of the farmers in the targeted areas depend on the borrowed money for farm investment (such as seeds and fertilizers for the next season). However, the limited supply of financial service providers relevant to farmers is a major constraint not only in the project area but throughout country. The Myanmar Agricultural Development Bank (MADB) is the only financial service supporting paddy farmers from Government's side. Additionally, NGOs such as GRET, Proximity Designs and PACT Global Microfinance have developed microfinance services managed by farmers' organizations in the aftermath of Cyclone Nargis (between 2008 and 2018). Also, financial and agricultural cooperatives have started offering financial services. However, the finance available in general is not enough for the required production fees. Additionally, farmers would like to get long-term loans rather than current short-term agricultural credits. As such, the only option available to farmers is often through financial assistance (with high interest rate) from village money lenders, using gold as the collateral.

Due to the COVID-19 pandemic, the Central Bank of Myanmar (CBM) lowered banks' deposit and lending rate by 3% per annum. As a consequence, MADB is offering agricultural loans at reduced rates from 8% to 5% per annum and JICA two step loan decrease from 8% to 5% per annum as well.

Impacts of COVID-19 on rice-based livelihoods

FAO assessments of the COVID-19 pandemic's impact on the agriculture, aquaculture, and fishing sectors in several regions of Myanmar show that measures to control the spread of COVID-19 have affected people's way of life. Overall, the findings of the surveys by the GEF-5 FishAdapt and SLM projects show that COVID-19 related restrictions have significant adverse effects on every aspect of food production, market access, produce prices, the quality and price of agricultural inputs, food availability, employment, and income generation in all communities where the research was undertaken. Findings from a LIFT-funded rapid market assessment in the Ayeyarwady Delta^[58] suggest that government-imposed restrictions have significantly affected agricultural trade and market systems across all levels. Large numbers of migrants are returning to their native villages due to the COVID-19 crisis. In many areas, this has led to a shortage of skilled labour such as agricultural machinery operators. The report also notes that returning migrants' participation in local labour markets within the agricultural sector will largely depend on the severity and length of impact that COVID-19 has on their livelihoods.

With the first confirmed case of COVID-19 in the country during the first quarter of 2020, the price and demand for rice in the domestic market spiked due to panic buying. This was controlled following the Myanmar Rice Federation (MRF) confirming that Myanmar had enough rice for domestic consumption and the Government adjusting trade policy to maintain price stability and ensuring sufficient supply for domestic market. The Government suspended issuing new license for rice export, imposed a quota to control rice export and exporter needed to sell 10% of the rice export volumes to

the supplemented Government rice stock supplies. Export restrictions were lifted again fairly swiftly during the second half of 2020 when rice supply-demand trends stabilized. Currently, the primary challenge with regard to international rice trade and export of rice from Myanmar is related to supply of empty containers which remain stuck in importing countries due to slowing shipments and trade during the peak of the COVID-19 pandemic.[59]⁵⁹

If the crisis is prolonged, it is anticipated that food insecurity and malnutrition will be exacerbated among poor farming households (including the landless, female headed households and returning migrants) in the wake of increased debt, rising costs, and eventual default on loans. Seed producers, companies and agro-input suppliers may be forced to adopt sub-optimal responses to increasing production costs, declining incomes and projected challenges in accessing loans. Among others, the LIFT assessment makes the following recommendations:[60]⁶⁰

- ? Use the crisis as an opportunity to 'push' the use of Information and Communications Technology (ICT) for extension service delivery and to develop solutions for access to mechanization services.
 - ? Promote 'blended' learning approaches in agricultural extension/education (e.g. CFFS) activities, combining field-based and home-based learning, making optimal use of available ICT tools while providing a safe and socially-distant learning environment.
 - ? For activities in the quality seed production sector that require field work (i.e. on-site field inspection for registered seed production), the DOA/ Department of Agricultural Research (DAR) could involve seed producers to be part of these teams using social distancing measures, including remote inspection modalities, in order to reduce reliance on their own personnel, while maintaining frequent monitoring levels. Alternative mechanisms such as Participatory Guarantee System (PGS) can be developed for certified seed production as an alternative to formal inspection by DOA.
 - ? Support seed suppliers (seed producers, companies, DOA/DAR farms, etc.) to ensure that their already limited outreach to farmers is not further reduced through improving their access to labour, foundation seeds, registered seeds, and other services.
 - ? Provide temporary smart subsidy mechanisms (for example through vouchers) to re-establish farmer and seed producers' purchasing power to buy quality inputs; while strengthening the capacity of agro-input providers (especially local dealers and sub-dealers) to supply key inputs (seeds, fertilizers) for farmers. (Note that some cash transfer programs were implemented by Government and NGOs as part of the COVID-19 response.)
 - ? Assist agribusinesses to use or expand scalable outgrower schemes (contract farming systems) with buyback guarantee mechanisms that promote the consolidation of farming systems and collaboration among smallholders.
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F. Root causes and barriers

The following root causes and problems lead to high vulnerability and low adaptive capacity of rice-based farming communities in the project areas. These root causes were identified through secondary literature review and confirmed through consultations with local stakeholders.

1. **Low farm incomes and poverty:** High labour and other input costs and low yields/value addition have trapped farmers in poverty, with farm incomes remaining low even in areas of double cropping and despite the relatively large farm size per household in the Delta.[61]⁶¹ Furthermore, while operations such as land preparation, threshing, water pumping, and milling are mostly mechanized, there are still low levels of mechanization in seeding, planting, weeding, fertilizing, pest control, harvesting, threshing, transportation, and drying.[62]⁶² Inequality further exacerbates rural poverty, and food insecurity among rural households is widespread during the low-harvest season.
 2. **Limited access to credit:** Farmers (in particular, women farmers) have limited capacity to invest in the development of their land due to a lack of access to credit and low levels of farmer organization. This also means that farmers have limited bargaining power and opportunity for value addition at farmgate level as paddy grains are sold immediately after harvest when prices are at the lowest.
 3. **Suboptimal farmer extension system:** The research and extension system in Myanmar has been largely underfunded, outdated and excessively focused on maximizing crop yields, to the relative neglect of other issues of critical importance to farmers, such as cost of production, profitability, integrated management of pests and diseases, water management, overall farm income, and suitability to agro-ecological zones. The uptake of improved technologies, therefore, has been limited.[63]⁶³ Township Agriculture and Agricultural Extension Offices lack adequate financial and human resources to provide effective and regular farmer support, and staff rotations are frequent. Furthermore, the extension support has been primarily focused on rice with limited support for development of more diversified and resilient farming systems.
 4. **Lack of knowledge/technologies:** Farmers lack the knowledge, skills and technologies that would enable them to enhance agricultural production, such as through the adoption of good agricultural practices and effective pest and weed management. Low or inappropriate use of agricultural inputs and limited access to high-quality and stress-tolerant seeds lead to low grain quality and low yields. As a result, output gain in Myanmar has come mostly from increased area rather than increased yields[64]⁶⁴, often at the detriment of farmland-surrounding ecosystems such as mangrove forests and wetlands and overall biodiversity in the rice-based landscapes.
 5. **Low levels of investment in infrastructure and water management:** There is low investment in processing technologies and facilities, leading to limited value addition at farmgate level, low
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grain quality and relatively high post-harvest losses. Out of the over 11,000 rice mills in Myanmar, 88% are small mills with low quality and very old machinery. Additionally, many villages still have no or only poor access to electricity, insufficient for running small businesses. Also, some farmers cannot send their produce to the market in a timely manner due to poor road conditions and lack of farm roads. In villages that are only accessible by boat during the monsoon season, siltation in rivers may cause delay in sending paddy to market. Furthermore, irrigation and drainage infrastructure in the project area needs updating and maintenance.[65]⁶⁵ Farming communities have limited capacity for water management, leading to flooded conditions during the monsoon season and low yields.

6. **Limited options for diversification:** Myanmar's agricultural policies have primarily focused on paddy crop production intensification, with limited diversification in the sector.[66]⁶⁶ Also, diversification in the Delta is limited in the monsoon season as there have been limited improvements in drainage and land development. Consequently, and despite strong farmer demand, paddy fields in most of the delta areas are difficult to convert to upland crops cultivation in summer thus limiting diversification opportunities and leaving farmers in a rice-centric trap. Change from a rice-centric policy to a food basket system will require significant investment in water management, particularly in low-lying areas and the delta.[67]⁶⁷ Limited diversification not only limits farm income and increases risks of crop failure due to pest and disease outbreaks, but has also led to high prevalence of malnutrition.[68]⁶⁸ (RiceAdapt baseline studies, 2020)
7. **Limited or insecure access to land:** A survey conducted in Pyapon township in Ayeyarwady found that farmers used high yielding seed varieties, agrochemical inputs and farm machinery as the key inputs to increase productivity. However, farmers with insecure land tenure have less inclination to invest in soil health and lack access to credit. Thus, they have limited options to invest in increasing farmland productivity, leading to low returns.[69]⁶⁹

The following barriers need to be overcome to address the root causes above.

Barrier 1: Inadequate capacity and policies to mainstream climate change adaptation measures into sectoral planning and implementation at various levels (addressed by Component 1)

Although a number of national level climate action-related strategies and plans already exist, assistance is still needed to help national and sub-national institutions translate these into local actions. Local governments require capacities and support in the design, adoption and implementation of policies to effectively support rice-based communities and landscapes to adopt climate resilient practices and technologies. Local governments currently have very limited technical and financial capacity to

provide the climate-smart agriculture (CSA) training and assistance required. There is likewise a lack of coherent, integrated, inter-sector approaches to managing production systems, and poor coordination mechanisms are in place at various levels to properly coordinate all the interventions made by different Government Ministries, I/NGOs and other development agencies. Also, the role that nature-based solutions can play in adaptation is poorly assessed and not adequately taken into account in local development plans. Collaboration between the educational, environmental and agricultural sectors is limited and lacking effective implementation mechanisms resulting into suboptimal implementation of inter-sectorial approaches, strategies and programmes.

Moreover, climate risk information and education is currently not strongly integrated into decision making for farming activities in the project area and the existing climate and weather advisories for agriculture still have significant room for improvement. DMH is currently the primary provider of weather forecast and services. Information is not collated or systematically transferred to the private sector, smallholder farmers, and other end-user to build awareness, inform farm-level decision-making, and provide an early warning of climate shocks. Strengthening the capacity of DOA and DMH in providing accurate and timely agrometeorological information to local farming communities is needed, so that farmers can adjust their cropping calendar, including land preparation and sowing time, based on reliable information.

A shift of focus from paddy production to more broad-based agricultural support and diversification will be essential to better leverage agriculture for poverty reduction, increase resilience of farming livelihoods, and enhance nutritional outcomes.^[70]⁷⁰ The prevailing rice production intensification policies present a barrier to farming systems diversification and more sustainable agricultural development. Although some progress has been made, such as allowing up to 20% of farmland to be used for aquaculture within a single holding, this still needs to be translated into farmer support and assurance at the local level, such as through amendment of the Farmland Law and more decentralized decision making on land use. According to the land law and regulations, there are complicated procedures to request an application to convert paddy land to other business purpose (including fish ponds, livestock farm, horticulture farm, rice mill) and it is still centralized by the Union government.^[71]⁷¹

Another policy recommendation is to remove export licenses on agricultural commodities. They are a non-tariff barrier that hinders Myanmar's export potential. For agricultural producers in general, this would lead to greater flexibility in responding to markets and supply-side conditions. Finally, policies related to agricultural loans also require improvement, in particular with regard to the size and duration of loans.

Barrier 2: Low capacities at local level to adopt and sustain climate resilient technologies and practices (addressed by Component 2)

Local traditional adaptation mechanisms and strategies are becoming inadequate in the face of increasing climate variability and extreme events. Local communities in the targeted areas do not have enough access to the knowledge, tools and network required to sustainably adopt climate resilient practices and technologies for rice farming or other sources of food production. Smallholders are highly reliant upon agricultural extension services and systems, and current support services are not organized or capacitated to assist producers to adequately adapt to climate change. Furthermore, access to required inputs (quality and quantity) remain insufficient while pest and disease management are increasingly inadequate given the prevailing monocropping of rice and associated risk of outbreaks of rice crop pest and diseases. Despite recent efforts to improve the rice seed supply in the target regions [72]⁷², there is still a widespread lack of access to quality seeds by farmers. Efforts by Government and NGOs in Ayeyarwady and Bago regions to support quality seed production, including by involving private sector actors and strengthening farmers' organizations, need to be scaled out.

Extension services and farmer support need to be strengthened to provide targeted support to farmers to improve their farming practices, such as through improved application of fertilizer, integrated pest management, and soil fertility management. Studies have noted that the extension services provided by DOA and local NGOs are still weak and this complicates efficient adaptation through adoption of improved management practices. Farmers' active participation in training will have a significant impact on the adoption rates of new technology from field trials and on-farm demonstrations to real field situation. [73]⁷³ These services should also include options for diversification, including for landless households, to increase their resilience in the face of climate risks and other challenges. Rice-fish, rice-duck, rice-shrimp farming/fishery systems, pulses and vegetables, home gardening, and livestock raising are potential livelihood opportunities that need to be improved.

Importantly also, farmers need to be provided with knowledge and skills to be able to use agrometeorological and climate information in their farming operations. According to the RiceAdapt baseline studies, the following means and ways are used for the dissemination of agriculture information, but need to be strengthened further: (1) newspapers and journals, (2) radio and TV (farmers' channel), (3) social media (Facebook), (4) Government website, (5) community meetings, (6) emergency alert system, (7) DOA call center, and (8) Green Way and other smartphone-based apps.

With regard to the development and adoption of climate-resilient rice (and other crop) varieties, the capacity of DAR to conduct research and development still needs further improvement, including with regard to equipment, facilities and human resources capacity. Participatory varietal selection trials need

to be scaled up in collaboration with DOA and local farming communities. The selection of varieties should be based on farmer and market/consumer actor priorities.

Lastly, the role of agroecology and nature-based solutions in local adaptation needs to be further recognized and disseminated. Building higher levels of awareness, knowledge and skills for sustainable management of biodiversity and agroecological processes among smallholder farmers in particular is a precondition for development of more sustainable rice-based farming systems and landscapes.

Barrier 3: Insufficient collaboration and coordination among farmers? organizations and private sector partners such as input suppliers, traders and processors (addressed by Component 3)

As mentioned above, farmers in the target townships generally have low levels of farmer organization, and there are limited partnerships and networks with private sector involvement that would enhance farmers' access to inputs and technologies. Smallholder rice producers -and women in particular- have limited access to post-harvest technologies, insurance, information, extension services, inputs and markets. Smallholders in the targeted regions are not well linked to markets or financial institutions, such as micro-credit or micro-insurance, making it very challenging for them to financially sustain their rice production over time. Moreover, these institutions are often reluctant to invest in smallholder producers given their high dependence on unpredictable weather patterns. Private sector investments in the agriculture sectors therefore remain low, including in value-adding activities despite their potential for enhancing rural economies.

Regarding farmers' marketing, there is no collective selling system and most of the farmers sell paddy directly to rice millers or to primary collectors/brokers. Farmers have to sell their produce after harvesting because they need financial capital to invest in summer crop cultivation; or because they do not have adequate drying and storage facilities. Thus, they are unable to negotiate better farmgate prices.

Drying facilities and storage technologies/capacities are inadequate to build a climate-resilient rice value chain. The use of farm machinery is low. Support for mechanization is limited, and poor households, in particular women, often do not have access to small farm machinery. While a majority of farmers use combine harvesters, other machinery such as dryers are rare and expensive. Local companies lack experience and technology to deliver climate-resilient farmer support systems, and there is insufficient support for local entrepreneurship, in particular for women and youth. Despite the recent guidelines on contract farming issued by MOALI, experience and capacity to put these into practice at the local level is still limited.

It has been noted that, with effective investments in increasing productivity and improvements in value chain development, Myanmar can position itself to respond well to emerging market opportunities, both domestically and internationally. Myanmar has considerable potential to intensify production and raise yields, both without detrimental impacts on the environment. Besides increasing yields, public investment should enhance quality, including product suitability for processing and for export to high-income countries (that offer better prices).[74]⁷⁴ Upgrading or using commercial large mills within the local area is essential to produce higher quality rice which could give higher market price for paddy.

Post-harvest losses: According to the Department of Agriculture (DOA), rice losses occurring during post-harvest operations average around 15% of the total quantity of rice produced in the country. Effective methods were identified under a previous FAO project to improve harvesting, post-harvest handling, storage, processing, packaging and marketing of rice for farmers in Myanmar, in particular in target areas of Naypyidaw and Ayeyarwady regions. The baseline and end survey results of this project showed that post-harvest rice loss was reduced by 28% through the project interventions (consisting of farmer field schools, season-long training for DOA and other agency staff, awareness raising activities, and field demonstrations).[75]⁷⁵ Similarly, nationally representative surveys in India have shown that harvest and post-harvest losses for pulses are in the range of 6-8% of production, which is higher than the losses for cereals (FAO, 2019).

Barrier 4: Lack of monitoring systems and knowledge management to monitor, evaluate and replicate good practices in adaptation (addressed by Component 4)

The institutions at national and region/local levels still lack adequate information and monitoring systems to monitor implementation of government policies such as the Climate Smart Agriculture Strategy, the Rice Sector Development Strategy, and the Myanmar Climate Change Master Plan (MCCMP). There is currently no comprehensive M&E system to monitor and evaluate adaptation and resilience in agriculture at the farm and landscape levels. M&E systems are generally project-specific and limited to the duration of project implementation.

Finally, national and international knowledge sharing on adaptation practices in rice-based farming systems is still limited. Myanmar does not have a comprehensive, cross-sectoral knowledge management system that would enable policy makers, government technicians and non-government sectors to learn from and replicate successful adaptation options in rice-based farming communities and landscapes.

2) Baseline scenario and any associated baseline projects

Under the baseline scenario, responses to climate change and related natural disasters in the target townships will continue to be ad hoc and sector- and location-specific. Such responses are also likely to lack an adequate base of information and capacities required for them to be fully implemented in a relevant, effective and sustainable manner. The interactions between the sectors (public and private) in relation to climate change will not be adequately taken into account. Also, the target townships and villages will not be able to fully benefit from the recent and ongoing development of tools and capacities for adaptation planning and implementation in the project regions. Vulnerable farmers and the landless will continue to implement suboptimal production and value chains. The lack of a more holistic vision in relation to climate change resilience and adaptation will mean that ecosystem-wide impacts of climate change (including on livelihoods), or landscape-wide resilience benefits, will fail to be recognized and taken into account.

To adopt climate-resilient practices in the rice and other agriculture sub-sectors that can withstand changes in climate, Myanmar's farmers and public and private stakeholders will need to apply new technologies, modify existing ones, scale up innovations, revise relevant laws and policies to integrate resilience and enhance capacity to access and use finance and technologies.

There is a solid baseline of institutional investments on which the project builds, supported by a strong framework of enabling policies and Government programmes. These include the Myanmar Climate Change Strategy and Action Plan (MCCSAP) 2016-2030, the National Adaptation Programme of Action (NAPA), the Myanmar Climate Change Policy (2019) and related Myanmar Climate Change Strategy and Master Plan (2018-2030), the National Environment Policy, the Climate Smart Agriculture Strategy, the Myanmar Rice Sector Development Strategy, the 2018 Agricultural Development Strategy, the National Rice Sector Export Strategy (2015-2019), and the 2020 Agriculture Action Plan for DRR.

The **Climate Smart Agriculture Strategy**[76]⁷⁶, developed in 2015 with support from CGIAR and the International Rice Research Institute (IRRI), includes the following target outcomes, to be implemented through a set of strategic thrusts and priority programs. In addition to crops, the CSA Strategy also covers climate-smart livestock and fisheries.

Adaptation targets:

- (1) New varieties and improved farming systems resilient to drought and water stress
- (2) Diversified rural income and improved household economic resilience
- (3) Increased prevention and protection against disasters

Mitigation targets:

- (1) Reduced CH₄ emissions
- (2) Reduced land degradation and soil erosion

Double-action targets:

- (1) New farming systems and techniques

Climate Smart Village (CSV) target:

- (1) Improved farmers' livelihoods and income
- (2) Climatic risks resilience of farming
- (3) Enhanced farmers' adaptive ability to climate change

Success stories and challenges in implementing the CSA Strategy have been documented in a paper published in 2019.[77]⁷⁷ Among the weaknesses mentioned by the report is the fact that the current CSA Strategy does not define clearly how actions will be implemented. Specific action plans are missing, and the promoted technologies/programs are not adapted to the local conditions. The roles and expected contributions of implementing offices are vague. The paper also highlighted that the CSA Strategy can promote transformative technologies to local communities if it can discuss clearly the cost of adoption and resource use effectiveness. In order to achieve this, the Strategy needs to be integrated into the current programs of the government and its contents translated in the local language in a format that local people can understand. Case studies of successful CSA implementation, including the FAO/GEF-5 SLM Project show that the adopted climate-smart practices have helped farmers cope with climate change and increased their household incomes.

The **Myanmar Rice Sector Development Strategy**, developed in 2015 with support from IRRI and FAO, has the following strategic objectives.^[78]⁷⁸

1. Objective 1: Increase rice productivity and improve rice quality and nutritional value.
2. Objective 2: Adapt to/mitigate the effects of climate change and reduce risk, while protecting the rice ecosystems and environment.
3. Objective 3: Promote Myanmar rice as a quality brand and enhance competitiveness in international trade.
4. Objective 4: Improve the well-being and capacity of smallholder farmers, including women, youth, and children.
5. Objective 5: Enhance efficiency in the rice value chain and reduce postharvest losses.

The strategy includes several interventions that are directly relevant to the RiceAdapt project. These include, but are not limited to:

- Breed and promote high-yielding and stress-tolerant rice varieties appropriate to the farmer and market preferences and suited to the different rice environments.
- Ensure the supply and adoption of good-quality seeds, appropriate fertilizer and pest management alternatives, and other integrated crop management practices.
- Strengthen technology delivery and extension services.
- Encourage the acquisition of farm machinery by farmers and organized farmer groups.
- Implement policies that encourage the private sector to provide custom services at affordable rates for operations such as land preparation, levelling, transplanting and harvesting, threshing, drying and storage to farmers.
- Promote the cultivation of 'special traditional rice varieties' with natural tolerance for deep water, prolonged flooding, or drought.
- Promote diversified farming systems.
- Conduct awareness campaigns and education programs and strengthen weather information delivery and early warning systems.
- Map areas vulnerable to floods, salinity, and drought to identify and plan adaptation measures.
- Effectively manage irrigation systems, improve irrigation services, and promote participatory water management involving farmer users and irrigator groups.
- Promote efficient nutrient management through proper application and timing.
- Promote integrated pest management practices and develop a framework on the appropriate use of pesticides to conserve the biodiversity of rice ecosystems.
- Upgrade existing mills or acquire new units to bolster efficiency, lower unit costs, and improve milled rice output.
- Improve current credit scheme for smallholder farmers.
- Empower women and youth in rice farming.

The **National Rice Sector Export Strategy**[79]⁷⁹ (2015-2019) includes the following strategic objectives:

1. Increase rice production and quality substantially.
 - Increase the use of high-yield varieties and high-quality seeds.
 - Increase production and use of fertilizers and pesticides.
 - Increase farm mechanization.
 - Reduce postharvest losses and quality-degrading practices at all stages of production.
 2. Increase efficiency and reduce costs through expansion of sector infrastructure
 3. Diversify export products and export markets.
 - Develop new markets and new, higher value-added rice products.
 - Establish brand recognition of Myanmar quality rice.
 4. Grow the rice sector in a way that promotes health, equitable growth and environmental sustainability.
 - As more farmers adopt modern agricultural practices, help them meet environmental standards, while helping organic farmers obtain better prices by branding their products as organic.
 - Create off-season jobs for seasonal agricultural workers.
-

The Myanmar Agriculture Development Strategy and Investment Plan (ADS)^[80]⁸⁰ (2018-19 ? 2022-23)

The ADS has the following three objectives:

1. Enhanced governance and capacity of institutions responsible for agricultural development
2. Increased productivity and farmers' income
3. Enhanced market linkages and competitiveness

The Strategy includes the following Outputs of relevance to the RiceAdapt project (selection):

- Increase production, value-addition, sale and consumption of GAP and OA (Organic Agriculture) rice, pulses, vegetables, fruits, meat, dairy, honey, cash crops, and other products.
- Establish an early warning system and adopt early warning information for managing climate change risks in agriculture and food and nutrition security.
- Establish climate information and weather indexation systems designed to provide information to farmers
- Identify models, lessons, and guidelines for effective contract farming and implement standard operating procedures for contract farming

Indicators (selection):

- Nutrition and food security indicators (reduced stunting and reduced household food insecurity)
 - Landless rural household income
 - Rural poverty share
 - Smallholder farmers' income (gender disaggregated)
 - Labour productivity
-

The **Agriculture Action Plan for Disaster Risk Reduction (AAPDRR)** (2020) serves as a consolidated planning document to address disaster risk reduction and management, resilience and climate change adaptation in the agriculture sector in a coherent manner. It includes the following priority interventions (among others):

- ? Promote and disseminate stress tolerant agricultural crop varieties, and other indigenous and innovative technologies to reduce risk to production, processing and marketing. Target area: Ayeyarwady (Myaung Mya, Myan Aung, Yay Kyi).
- ? Establish an agriculture sector specific climate change data management system in MoALI. Data and information system to enhance damage & loss and vulnerability assessments in agriculture.
- ? Enhanced use of ICT tools to communicate multi hazard early warnings (EW) & agriculture specific technical guidance to local/regional levels.
- ? Replicate climate smart agriculture practices through CBDRR approaches and capacity building and educational training of local authorities, government, organizations and local communities on agriculture related DRR, CSA and risk forecasting.
- ? Improve access to micro capital loans and establish an emergency credit system for cooperative members in vulnerable areas.

The **Myanmar Climate Change Strategy (MCCS)**[81]⁸¹ includes the following outcomes and indicators of relevance to the RiceAdapt project (selection):

? Sectoral Outcome 1: Achieve climate-resilient productivity and climate-smart responses in the agriculture, fisheries and livestock sectors to support food security and livelihood strategies while also promoting resource-efficient and low-carbon practices.

of officials trained on sector-specific guidelines and tools for integrating climate change into planning and budgeting systems.

of sectors, geographical areas, and technology-specific institutional arrangements, including a multi-stakeholder engagement framework developed to implement climate change responses at national, sub-national and local levels.

of climate change adaptation projects implemented through externally supported finance and domestic resources.

of climate-smart technologies and good practices introduced and scaled up in Central Dry Zone, the Ayeyarwady Delta and Coastal Zone and low land areas.

of farmers (both men and women) benefiting from the introduction of climate-smart technologies and other responses.

? Sectoral Outcome 2: Natural resource management that enhances the resilience of biodiversity and ecosystem services that support social and economic development and deliver carbon sequestration.

of households, NGOs and community-based organisations that have benefited from access to and implementation of environmentally sound technologies, good management practices, including ecosystem-based adaptation approaches and training received, disaggregated by sex.

of geographical areas covered and technology-specific institutional arrangements, including a multi-stakeholder engagement framework developed to implement climate change responses at national, sub-national and local levels.

In line with this Strategy, the **Myanmar Climate Change Master Plan (MCCMP)**[82]⁸² includes the following objectives and activities (selection):

? Develop climate change vulnerability assessments and local adaptation and resilience plans in all townships and cities.

? Identify and implement livelihood diversification activities (both on- and off- farm) in vulnerable areas.

? Carry out trainings for farmers on using agromet and climate information.

? Build capacity to carry out hydrological analysis in all flood-sensitive areas.

? Carry out climate change awareness-raising and capacity-building activities, targeting extension agents and government staff.

? Develop farmer-friendly, gender-sensitive training and awareness-raising materials to address climate change.

Myanmar has consistently accorded the highest priority to the rice sector because of its crucial role in food security, as well as its social and political importance to the country. 70% of the rural population of Myanmar engages in rice farming for their livelihood. The country recognizes that investment in a climate-resilient development pathway and adopting climate technologies at an early stage can provide sustainable and resource-efficient opportunities for socioeconomic development, including green jobs and resilient business models. The project will contribute to the implementation of the MCCSAP at a number of levels through integrated sustainable natural resource management with sustainable and resilient livelihoods. At the higher level, the proposed project responds directly to first of MCCSAP's two main objectives, namely to increase the adaptive capacity of vulnerable communities and sectors so they are resilient to the impacts of climate change.

Agrometeorological stations. With regard to DMH offices in the RiceAdapt target areas, there is one DMH office in Maubin Township. Furthermore, there are two agromet stations (Myaungmya and Tagondine/Hinthada) in Ayeyarwady Region and one station (Laydatpyin) in Bago Region.

DAR and DOA offices. Both DAR and DOA have offices at the township level and implement agricultural extension and research and development programs.^[83]⁸³ The current seed production and distribution system is summarized in the graph below.

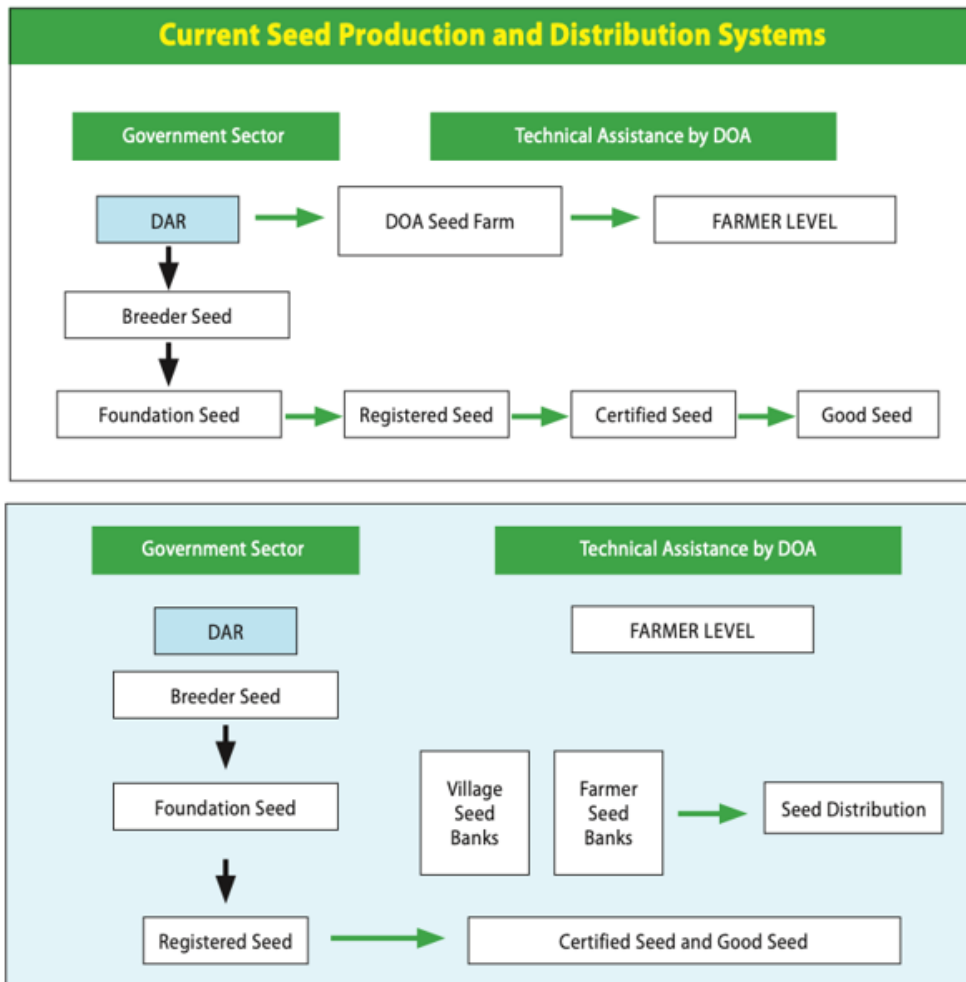


Figure 19: Existing seed production and distribution systems in Myanmar (Source: IRRI, 2017)^[84]

Existing Coordination Mechanisms

In 2016, Myanmar created the National Environmental Conservation and Climate Change Central Committee (NECCCC) as the highest-level platform for environmental and climate change issues. This central committee is chaired by the Vice-President and contains six Working Committees (of which one is Climate Change Adaptation and Mitigation) that are chaired by the Permanent Secretaries of various Ministries. Among its terms of reference is the 'formulation of climate change mitigation and adaptation related policy, strategies, tactics, short term and long-term plans and coordinating for the sectoral cooperation'. The NECCCC meets twice a year and is mandated with the overall leading role in implementing the MCCS 2018-2030.

The Technical Working Group (TWG) was originally set up under the Myanmar Climate Change Alliance (MCCA) programme to advise the formulation of the MCCS 2018-2030 and has become a multi-stakeholder coordination platform composed of technical representatives from relevant line ministries that also includes private sector and CSO representatives and is due to become a permanent interdisciplinary platform for exchange under implementation of the MCCS. Six sectoral Working Groups were set up under the TWG to provide specific expertise and consultative advice on the MCCS and the MCCMP for the six key social and economic sectors identified in these policy documents.

Government Programmes

The main Government implemented programmes upon which the RiceAdapt project builds are summarized below. Please also refer to Section *6.b Coordination with other relevant GEF-financed projects and other initiatives* for other relevant initiatives.

The baseline investments described below provide important foundations for developing capacities of the national and sub-national institutions and stakeholders. However, further investments are needed to consolidate the developed capacity and scale out approaches to a wider area. The LDCF additional investment will leverage and strengthen the efforts in developing climate-resilient livelihoods in the targeted areas and replicate successful approaches in nearby townships and villages.

Programme/project	Links with RiceAdapt project
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1) Resilient Community Development Project (RCDP)

2019-2026, ADB/MOALI, USD 100 million

The RCDP project targets areas that are vulnerable to climate and disaster risk (CDR) and will support government's policy of strengthening resilience through rural livelihoods and village infrastructure by incorporating climate and disaster risk considerations in planning, design and implementation of community interventions. It will also build capacities of villagers, township and village tract level administrations and strengthen mechanisms in delivering basic services and livelihood support to the poorest communities in rural Myanmar. The project has identified clusters of poor townships in regions exposed to CDR using climate projections and 2014 census data. It will benefit about 1.8 million people in 17 townships in **Ayeyarwady**, Chin, Sagaing, and Tanintharyi. The project supports the Government of Myanmar in strengthening its community-based development policies and procedures. It aims to strengthen community resilience and reduce the food insecurity and poverty of rural people living in vulnerable areas, by building their capacity and providing resources to invest sustainably in climate- and disaster-resilient and market-oriented infrastructure and livelihoods.

Within MOALI, the project is led by the Department of Rural Development (DRD). In Ayeyarwady Region, the project will focus on the coastal townships of **Bogale, Labutta and Pyapon**.

Under **Output 1** of this project, 3,000 climate- and disaster-resilient community infrastructure subprojects will be identified through a participatory Village Development Planning (VDP) and funded through block grants.

Under **Output 2**, at least 15,000 resilient livelihood subprojects will be funded through block grants, with a focus on poor women and men. Livelihood subprojects could include new or improved climate-smart agriculture, livestock, fisheries activities, value addition to farm and nonfarm products, marketing, and the acquisition of new skills for employment.

Under **Output 3**, the project will support DRD to develop its VDP process and build its capacity to assist villagers.

Close coordination and collaboration with the RCDP will be undertaken to take advantage of synergies and increase scale and durability. Both projects operate in Ayeyarwady region (although in different townships), and the two projects have agreed to exchange closely and benefit from the approaches developed in each.

i) The RiceAdapt project will involve DRD staff in the project implementation in order to support transfer and scaling of the knowledge and capacity developed under the RCDP project beyond the RCDP target townships, including transfer within Ayeyarwady and to Bago Region.

ii) In addition, the RiceAdapt project will build on the developed VDP process for its local adaptation planning.

iii) Technical exchange on climate-smart agriculture approaches will also be undertaken between the two projects.

iv) Lastly, the capacity building on climate adaptation will be closely coordinated with the trainings implemented by DRD, including the DRD training unit and knowledge centres.

2) **Strengthening Climate and Disaster Resilience of Myanmar Communities**

2018-2021, ADB Technical Assistance project financed by the Government of Canada, USD 7.5 million

Executing agency: Relief and Resettlement Department (RRD) under the Ministry of Social Welfare, Relief, and Resettlement, in collaboration with DMH, ECD and DRD/DOA

The project's expected outcome is strengthened climate and disaster risk governance at the national level and in **Ayeyarwady** region in Myanmar. The project is composed of the following outputs.

Output 1: Improved Capacity to Understand Climate and Disaster Risk. Under this output, the project aims to improve capacity in government agencies at the national level and in Ayeyarwady region to understand climate and disaster risk. It will (i) train stakeholders on linking DRM and CCA, (ii) undertake disaster risk modelling at the national level and for Ayeyarwady, (iii) enhance early warning and installation of agromet stations in Ayeyarwady Region, and (iv) collect disaster loss data for Ayeyarwady. An open-source Myanmar Disaster Risk Platform is being developed.^[85]

Output 2: Enhanced Capacity to Undertake Resilient Investments in Agriculture and Rural Development activities. The project will pilot on mid- and long-range climate information for agriculture planning in Ayeyarwady Region. It will also pilot climate and disaster-resilient Village Development Planning and implementation of non-structural measures.

Output 3: Increased Awareness and Capacity on Disaster Risk Financing (DRF). The project will support the development of a national DRF strategy based on a risk-layered approach that will recommend suitable financing instruments ? including insurance (such as microinsurance, agricultural insurance, small and medium-sized enterprises insurance, and portfolio insurance of microfinance institutions).

Within Ayeyarwady Region, activities will be implemented

The RiceAdapt project directly benefits from the capacity, policy and pilots developed by this project both at national level and in Ayeyarwady Region. While the project townships do not overlap, the RiceAdapt project aims to apply the developed approaches on DRM and CCA in the target townships and, thus, help to scale out the achievements of this project within Ayeyarwady and to Bago Region. It will also help to further consolidate capacity and coordination mechanism developed among the different government institutions including RRD, DMH, ECD, DRD and DOA.

3) Project for Improvement on Accessibility of Rice Certified Seed

2017-2022, JICA, JPY 558.93 million (USD 5 million)

This project aims to increase the farmers' accessibility to rice certified seeds (CS) in the Shwebo District, Sagaing Region and **Ayeyarwady** Region in order to improve the productivity and quality of rice in the area. The project is strengthening the public-private collaboration for CS production and utilization, improving extension staff and seed farm staff capacity in terms of field inspection and CS production, improving the efficiency of CS laboratory test, and improving awareness of advantages of CS for increased demand.

Yangon Seed Laboratory, Department of Agriculture (DOA)

Kangyidaunt Township (Patheingyi District), Nyaungdon Township (Mawlaikya District), and Myaungmya Township (Myaungmya District).

The RiceAdapt project will coordinate with this initiative under its Components 2 and 3, particularly to promote the cultivation of high quality/premium market seeds with tolerance to climatic and biotic stresses, and by improving exports arrangements and improving access to markets.

4) Ayeyarwady Integrated River Basin Management (AIRBM)

2015-2022, World Bank, USD 100 million

Implemented by the Directorate of Water Resources and Improvement of River Systems (DWIR) within the Ministry of Transport (MoT)

The project has four components: 1) water resource management institutions, decision support systems (DSS) and capacity building; 2) hydro-meteorological observation and information systems modernization; 3) navigation enhancement on the Ayeyarwady River; 4) contingent emergency response. The project will respond to the analyses and proposals included within the WB-supported State of the Basin Assessment (SOBA) for the Ayeyarwady.

This project addresses issues of water resource management institutions, decision support systems and capacity building, hydro-meteorological observation and information systems modernization, navigation enhancement and contingent emergency responses. Under Component 4 of this project, DMH will undertake the installation of 100 Automatic Weather Stations (AWS).

Collaboration with this project will be sought when improving national and region/state-level level capacities in weather forecasting, agromet services and early warning systems. The tools being piloted, if proved successful can be scaled up in the project targeted areas for flood risk monitoring and management. The RiceAdapt project will benefit from several outputs of this project, in particular the (i) hydromet station modernization, automatic weather stations, flood forecasting and climate advisory services in agriculture, (ii) the DSS and basin information generated by the project.

5) **Agricultural Income Improvement Project Phase II**

2020-2026, JICA, tentative budget JPY 12,000 million
(USD 112 million)

Currently under development

The project seeks to improve agricultural productivity by rehabilitating and building infrastructures for agricultural production and distribution in **Ayeyarwady** region as well as promoting agricultural expertise extension and mechanization. The infrastructure improvements will involve rural roads and transports, as well as irrigation infrastructure, dikes, canals, etc.

Kyaiklat, Maubin and Wakema are among the main target areas of this project.

The RiceAdapt project will significantly leverage on these activities on the promotion of rice-based livelihoods in selected target areas, and will take into account and build on efforts in improving agricultural incomes. Also, the project will have to take into account the planned improvements in infrastructure when implementing its activities in Ayeyarwady Region.

<p>6) Strengthening Agriculture Extension in Myanmar</p> <p>2019-2023, KOICA, USD 9.48 million</p> <p>The project is promoting agricultural extension services, capacity development, e-data collecting system, technology dissemination, and monitoring & evaluation. As part of the project, e-Extension and information system will be established, which will enhance the efficiency of extension service using ICT technology considering the linkage with the e-Administration system such as Farmer Registration and Statistics developed by Department of Agricultural Land Management and Statistics (DALMS), MOALI.</p> <p>Knowledge centres will be constructed in selected areas and demonstration farm will make for efficient extension service delivery to farmers. Existing DOA Call Centres are being upgraded for the development of e-extension and information system. Additionally, motorbikes and vehicles to Township Offices and District Offices will be provided for increasing and efficiency of extension service delivery and monitoring activities</p> <p>The project will cover 27 townships, 13 districts in 10 states/regions.</p>	<p>The RiceAdapt project will build on the strengthened extension system supported by this project, with emphasis on mainstreaming climate resilient practices in the extension services, and facilitating value chain linkages.</p>
<p>7) Dry Storage and Rice Processing Complex</p> <p>Korea Rural Community Corporation (2016-2019), USD 3.5 million.</p> <p>This project is providing storage facility, drying equipment, septic tanks, ground tanks, earth embankments, road way (earth work), road construction, farmer market, rice processing machine, power supply.</p>	<p>The RiceAdapt project will collaborate with/build on the achievements of this project in designing and implementing improvements in the rice processing under Component 3.</p>

COVID-19 Economic Relief Plan

The recently launched government's COVID-19 Economic Relief Plan (CERP) outlines support for farmers and agricultural businesses through proposed actions that recognize the importance of food and

nutrition security and aim to achieve increased production in the agriculture, fishery, and livestock sectors. The CERP comprises seven goals, including Goal 4 on 'Easing the impact on households' and Goal 7 on 'Increasing access to COVID-19 response financing'. MOALI with the assistance of UN agencies and development partners is undertaking relevant programmes to support farmers, small agri-processors and agribusinesses. Cash transfers to vulnerable and affected households are also being implemented.

Private sector

Contract farming. Contract farming systems have been highlighted recently by government and NGOs as a way to increase the linkages between farmers and agribusiness and to assist farmers in obtaining farming inputs, technical assistance and market guarantees. This is also a major intervention under MOALI's COVID-19 Economic Relief Plan (CERP) for seed production. In 2020, MOALI issued Standard Operating Procedures (SOPs) for contract farming.^[86]⁸⁶ The aim of the SOPs is to systematically improve cooperation and functioning between farmers, growers and private companies, entrepreneurs and their organizations or associations. In 2020, DOA and MRF negotiated with rice farmers and companies to implement contract farming on over 40,000 ha of monsoon paddy in 49 townships, involving 53 companies. This included 16,000 ha in Ayeyarwady region and 20,000 ha in Bago region.^[87]⁸⁷ Contract farming aims to share the risks between the farmers and the companies if the crops are damaged by conditions such as floods and drought. There are seven rice seed contract farming companies in Ayeyarwady Region, most of which were established as cost-sharing investments under Welthungerhilfe's Rice Seed Sector Development (RSSD) project.^[88]⁸⁸

Public-private partnerships (PPPs). PPPs have developed in recent years, and help to address some of the constraints to credit, input access, innovation, processing, and milling of agricultural output for selected groups of farmers. The Myanmar Rice Federation (MRF) has facilitated the development of rice supply chains, together with associations for producers, millers, and traders. Rice Specialized Companies (RSCs) contract farmers under the oversight of MRF to provide credit, inputs such as seeds and fertilizers, and mechanization services to farmers. Under the guidance of the MRF, significant domestic investments were made in milling and storage facilities.^[89]⁸⁹ The Sustainable Rice Platform (SRP) is another example of an innovative public-private sector partnership at global level that can facilitate the development of sustainable rice cultivation and connecting farmers to markets. For details, see box below.

Crop insurance. In January 2018, the Ministry of Planning and Finance approved a two-year pilot crop insurance project by Global World Insurance aiming to cover damages to crops as a result of erratic weather conditions in Myanmar. It commenced in 2018 monsoon paddy season and covers Yangon, Ayeyarwady, Magway and Mandalay regions. However, the implementation of this scheme is expected to face challenges due to the associated risks and complexities. One of the challenges in implementing crop insurance in Myanmar is setting a suitable premium rate, given the absence of prior benchmark to measure risk levels.[90]⁹⁰

Myanmar Rice Federation (MRF). MRF, formally established in 2012 as a national level federation, represents the private sector of Myanmar's rice industry. The strategic members of MRF are Myanmar Rice Miller Association (MRMA), Myanmar Rice & Paddy Traders Association (MRPTA), Myanmar Paddy Producers Association (MPPA), Myanmar Agribusiness Public Corporation Ltd (MAPCO), and Rice Farmers, Rice Exporters, Millers and Traders. The objectives of MRF are to support and implement the sustainable development of Myanmar rice industry by optimizing the effective and efficient utilization of all the available resources in the rice industry. MRF is a member-driven Federation, which acts in the interest for the welfare of members and stakeholders. Moreover, MRF is implementing and encouraging market-based mechanisms to ensure supply and price stability, to modernize and upgrade processing and storage facilities, to incentivize producers and stakeholders, to strengthen quality seed production and most importantly, to ensure national food security. MRF will be engaged as one of the key stakeholders of the project, in particular under Component 3.

Rice millers. Rice millers are generally classified into two categories based on their size of business as small mills and commercial (large) mills. Rice millers send the processing rice to the end markets for wholesalers and/or retailers in township market who tend to be contracted for their business on long term bases. Mechanisms for connecting farmers with rice wholesalers and retailers in the villages and township levels are generally lacking. The Myanmar Rice Industry Association (MRIA) has been established among village millers and township wholesalers although its functioning remains insufficient and with limited engagement and action among the members. The end market price of domestic rice depends on the price of millers selling price, quality differences and quantity bought by the consumers.

MAPCO. Myanmar Agribusiness Public Corporation Limited (MAPCO) was formally formed in August 2012 as a Public Company, fully owned by private investors. MAPCO, a member of UN Global Compact, promotes sustainability and profitability in the interest of national food security, rice and agriculture sector development of Myanmar. MAPCO imports innovative and high-tech agricultural machinery and equipment. Among others, MAPCO operates a rice mill and a rice husk power generation facility in Kyaiklat township in Ayeyarwady (a RiceAdapt target township), and a rice mill and rice processing, storage and drying infrastructure in Yangon.[91]⁹¹

Golden Sunland. Under the 'Linking Labutta to Market' project funded by LIFT and implemented by Mercy Corps, contract farming arrangements were established between farmers and Golden Sunland, a Singapore-based company promoting responsible farming business from seed to harvest. Golden Sunland provided credits, quality seeds and other inputs, as well as improved farming practices including better post-harvest handling and applied full buy-back scheme. Golden Sunland then exports the procured paddy to international markets. The RiceAdapt project aims to expand this collaboration to other townships in the target area.[\[92\]](#)⁹²

ICT tools / mobile applications

Several ICT tools and mobile applications were developed in recent years to support market linkages and information systems for farmers and agribusinesses.

1. *Myanmar Rice Portal*. This new mobile application, launched in 2021, was developed by Green Way IT with the support of MRF and the RSSD project. It has close to 300 registered users to date.[93]⁹³ The app aims to facilitate communication and deal making among actors (farmers, traders, millers, seed producers, buyers, exporters) involved in the rice seed sector.
2. *Quality Seeds mobile application*. Under an initiative of the RSSD project, DOA launched the ?Quality Seeds? mobile application supporting market linkages for seeds between farmers and seed producers. Farmers can search the required quality seeds and varieties of rice, wheat, sesame, green gram, and maize, and can connect directly to the seed producers.[94]⁹⁴
3. *Golden Paddy*. Developed by Impact Terra, this app helps farmers to improve their crop productivity by sharing leading agricultural knowledge and specific, real-time recommendations and alerts. It also expands the farmer?s market connections and facilitates access to improved financing opportunities. The Golden Paddy platform provides customized services, based on the crop a farmer grows, the location he or she lives and other characteristics. Service providers use the platform to collect insightful data, advertise their products and services and support farmers.[95]⁹⁵
4. *Green Way Agri-Mobile App*. This free-for-use mobile application developed by the start-up Greenovator was created to empower farmers to improve their productivity and incomes by providing them with real time information such as farming practices, livestock techniques, weather forecast, farming record, e-commerce marketplace, seller-buyer linkage questions and answers, daily crop market prices, updated news, and TV and radio programme from the farmer channel.[96]⁹⁶
5. *Agrivi farm management app*. This mobile application helps farmers plan, record, monitor and analyse activities on their farm. Further development of the app was supported by the Climate Smart Rice Project for farm record keeping in support of SRP verification. A recent review has revealed the need for further development and/or development of a new app to better SRP data recording and analysis needs, in particular to assess compliance with SRP Standard requirements and for verification of SRP claims.
6. *Htwet Toe agri-mobile application*. This app, created by Village Link Myanmar, a subsidiary of Myanma Awba Group. The app provides farmers and other stakeholders with crop guides, weekly crop price, financial services, remote sensing analytics, weather advisories, e-commerce services, a call center, and news articles and videos.
7. *The Village Link Satellite Service (VLSS)*. VLSS is an application that allows businesses to aggregate, model and visualize data feeds from various sources containing geospatial data, agri-related satellite imagery, and drone technology. VLSS aggregates satellite data related to agriculture and transforms them into key information which businesses organizations can use to improve their operations and decision making such as weather analytics, crop monitoring, and land monitoring services.[97]⁹⁷

Sustainable Rice Platform (SRP) Standard

The **SRP Standard for Sustainable Rice Cultivation** is the world's first voluntary sustainability standard for rice, covering all farm-level processes in rice production. It is underpinned by proven best practices as advocated by the International Rice Research Institute (IRRI). In tandem with the SRP Assurance Scheme, implemented by GLOBALG.A.P., the standard provides a robust and transparent process to assess compliance and to verify claims. In Myanmar, the UNEP/Helvetas/Prime/SRP implemented Climate Smart Rice Project promotes the adoption of SRP good practices by Bago, Mon, Mandalay and Shan rice farmers with the first claims of *Sustainable Cultivated Rice* by smallholders in Southern Shan State verified through 3rd party audit in late 2020.

The SRP Standard provides a full suite of good agricultural practices for sustainable rice production, fully aligned with principles for Climate Smart Agriculture, food safety and labour rights. The SRP Standard is comprised of 8 themes and 41 requirements. It remains the only global voluntary standard for rice. It is not a pass/fail standard but engages farmers in a continuous improvement process to facilitate adoption of sustainable practices. Farmers and buyers can make claims regarding sustainable rice cultivation depending on the obtained SRP Standard compliance score, and the level of verification in the assurance process. The SRP Assurance Scheme is now fully operational and managed by GLOBALG.A.P. In case of interested buyers, the SRP Standard can provide a pull factor for farmers to move to more sustainable rice cultivation. There is a growing interest in promoting the SRP Standard and sourcing *SRP Verified* premium quality rice from Myanmar among various stakeholders from public and private sector.

Themes and Requirements in the SRP Standard for Sustainable Rice Cultivation^[98]

Farm management	Preplanting	Water use	Nutrient management
<ul style="list-style-type: none"> - Crop calendar - Record keeping - Training 	<ul style="list-style-type: none"> - Heavy metals - Soil salinity - Land conversion and biodiversity - Invasive species - Levelling - Pure seed quality 	<ul style="list-style-type: none"> - Water management - Irrigation system at community level - Inbound water quality - Groundwater extraction - Drainage 	<ul style="list-style-type: none"> - Nutrient management (organic and/or inorganic) - Organic fertiliser choice - Inorganic fertiliser choice
Integrated pest management	Harvest and postharvest	Health and safety	Labour rights
<ul style="list-style-type: none"> - Weeds - Insects - Diseases 	<ul style="list-style-type: none"> - Timing of harvest - Harvest equipment - Drying time 	<ul style="list-style-type: none"> - Safety instructions - Tools and equipment 	<ul style="list-style-type: none"> - Child labour - Hazardous work - Education

Donor-funded projects

The GEF-7 project builds on the following baseline investments by various donor agencies and civil society organizations.

Programme	Linkages with RiceAdapt
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1) **FAO**

FAO is implementing several projects and programmes in Myanmar in line with its Country Programming Framework 2017-2022. The most relevant for the RiceAdapt project are summarized below.

In 2017-18, FAO supported MOALI in developing a draft national agriculture extension modernization strategy. The draft strategy highlighted that specialized training based on farmers' needs and constraints, agro-ecological and socio-economic conditions, are virtually lacking in Myanmar. There are plans to develop an e-agriculture strategy.

FAO is supporting the Government of Myanmar in implementing the **GEF-5 LDCF FishAdapt and GEF-5 SLM projects**. Both projects have target townships in the Ayeyarwady Delta (although not overlapping with the RiceAdapt project) and are applying approaches for adaptation and climate-smart agriculture of relevance to the RiceAdapt project. FAO is also supporting the Government to prepare a **GCF** project in the Chindwin River Basin. Please refer to Section 6.b for details.

FAO is implementing a Technical Cooperation Project (TCP) on **Double Monsoon Rice** (2020-2022), to support Myanmar's efforts to increase rice production as part of the COVID-19 recovery. The project will conduct a feasibility study to explore the possibility of introducing Double Monsoon Rice System in Myanmar. One township from each of the three regions Ayeyarwady, Yangon and Bago will be selected as pilot townships. The project will also aim to strengthen the capacity on post-harvest processing and management of rice and improve access to market and financial services.

FAO is also implementing a regional TCP project on **Direct Seeded Rice** in Myanmar, Cambodia, and Philippines from 2020-2021. The project supports a shift from Puddled Transplanted Rice (PTR) towards Direct Seeded Rice (DSR). DSR is gaining popularity because of its low-input demand. It saves scarce and expensive resources such as labour and water, and reduces GHG emissions. To succeed the transition from PTR to DSR, mechanization is vitally important. Thus, the project also aims to develop capacities of mechanization service provider entrepreneurs. Note: Risk mitigation measures are to be put in place to avoid indiscriminate use of herbicides, as these are generally more commonly used in DSR.

From 2015-2017, FAO in close collaboration with DOA, the Department of Agricultural Research (DAR), Yezin Agriculture University (YAU) and the private sector, in particular the Myanmar Rice Federation (MRF), implemented the TCP project, **Reduction of Post Harvest Losses along the Food Chain in Myanmar**. The project was focused on the promotion of Good Agricultural Practices (GAP) and Good Manufacturing Practices (GMP), as well as Farmer Field School (FFS) training manuals. Some 4,000 smallholder farmers from selected townships in Ayeyarwady (including Meuhin and Nyaungdoga townships) and Nay Pyi Taw regions were

The RiceAdapt project will incorporate the lessons learned of ongoing projects and will collaborate closely with FAO's existing and future initiatives in Myanmar to enhance synergies and impact.

2) Climate Smart Rice Project

2019-2021, NORAD/SDC, USD 5 million

The Climate Smart Rice Project supports the Government of Myanmar, the agribusiness sector and smallholder rice farmers to stimulate transformation of the rice sector towards sustainability. It aims to introduce sustainable standards and best practices to 4,000 smallholder farmers around Mandalay, southern Shan, Mon and **Bago**. The project is funded by the Norwegian Agency for Development Cooperation (NORAD) and the Swiss Agency for Development (SDC) and implemented by a consortium of partners including UN Environment, the Sustainable Rice Platform (SRP), Helvetas Myanmar and PRIME Agri Group.

Among others, this project has so far (i) developed and tested SRP training material tailored for the Myanmar context, (ii) trained agronomists and agro-technicians on SRP Standard for sustainable rice cultivation and on Farm Management software that will be used for the Internal Management System (IMS) of farmers groups for SRP verification, (iii) linked partner rice millers with fertilizer and rice seed companies who provided registered seed and fertilizers on credit as part of contract farming, (iv) participated in technical working group meetings to develop Standard Operational Procedures (SOP) for contract farming and Contract Farming Law in Bago Region, (v) facilitated training and organization of Water User Groups (WUGs) in three irrigation catchment areas, including in Bago Region. In 2021, the first 1,045 Myanmar rice farmers (in Shan State) were certified to deliver SRP Verified rice.^[101]¹⁰¹

The Myanmar version of the SRP Standard together with SRP training materials for agro-technicians and farmers have been made available on the Green Way Agri-mobile app. The project has also facilitated linkages with Awba and fertilizer companies.

The project works in a total of 10 villages in Bago: 5 villages in Kawa (Kawa-1 Ward, Kyar Taw, Neik Bam, Ohn Nel, Thin Ban Kan), and 5 villages in Thanatpin (Nyan Kyun, Zee Pin, Ka Latt, Ka Thae Kone, Ka Laing) (5 villages for monsoon rice and 5 villages for dry season rice).

Field trials on flood-tolerant rice varieties have also been conducted. Five varieties (four flood and one salt tolerant) are being testing in the field trials in Mon and Bago regions. Furthermore, community seed banks have been successfully established, including the establishment of community seed bank committees.

In its first year of implementation, the Climate Smart Rice Project has generated valuable lessons that will benefit the RiceAdapt project. In particular, the project has highlighted that the use of good quality inputs, such as registered rice seed and optimized fertilizer application, are key to ensure compliance with the SRP Standard requirements. Responsible use of quality inputs also has contributed to yield increases of 15-25% boosting farmers' income. Also, to establish SRP verified rice value chain targeting the export markets, the rice mills should meet quality management standards including food safety required by the International markets. The project has also highlighted that

3) Sustainable Rice Platform (SRP)

The Sustainable Rice Platform (SRP) is a global multi-stakeholder alliance of over 100 institutional members from public, private, research, civil society and the financial sector. The SRP initiative was originally co-convened by the International Rice Research Institute (IRRI), the United Nations Environment Programme (UNEP) and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH (GIZ) and is now an independent member association. SRP works with partners to transform the global rice sector by improving smallholder livelihoods, reducing the social, environmental and climate footprint of rice production; and by offering the global rice market an assured supply of sustainably produced rice. SRP aims to reach 10 million rice farmers by 2030 and have them adopt good practices in compliance with the SRP Standard. Under this umbrella, UN Environment, FAO, GIZ (German Agency for International Cooperation), World Business Council for Sustainable Development (WBCSD) and other partners have developed the **Sustainable Rice Landscapes Initiative (SRLI)**, an umbrella programme of which the Myanmar RiceAdapt project is a part.

The SRP standard has three levels of verification:

- 1) Assurance level 1: Self-Assessment
- 2) Assurance level 2: Second Party Verification (such as through PGS, external SRP approved Verification Body linked to producers or producer groups)
- 3) Assurance level 3: Third Party Verification by approved SRP Verification Body

Level 1: First level does not involve annual fee, but farmers self-register in the SRP database. Off-product use of SRP claims and logo.

Level 2: On-product use of SRP claims (no "verified rice" logo).

Level 3: On-product use of SRP verified claim and "verified rice" logo.

The RiceAdapt project will utilize SRP to promote partnerships and coordination with other relevant initiatives, by building closely on the Climate Smart Rice Project and other relevant initiatives in Myanmar. Moreover, the RiceAdapt project can benefit from similar interventions in the region under the SRLI umbrella, including a GEF-7 project in Cambodia and Vietnam.

4) International Rice Research Institute (IRRI) projects

IRRI, in collaboration with other CGIAR centres, is implementing several projects and initiatives in Myanmar. IRRI's work in Myanmar has involved the development and promotion of improved rice varieties, along with a range of agricultural innovations such as improved land preparation, new planting and transplanting technologies, and a range of best crop management practices, including for fertilizer use, pest and disease management, and improved water use efficiency. IRRI has also worked on the development of mechanized harvesting, improved threshing, drying, and storage, and improved crop residue utilization, especially for rice straw and husk. IRRI is also pioneering the development of smartphone based advisory systems for Integrated Nutrient Management and IPM (e.g. Rice Doctor).

From 2012-2017, IRRI together with DOA and DAR of MOALI implemented the 'Diversification and intensification of rice-based cropping systems in lower Myanmar (MyRice)' project, funded by the Australian Centre for International Agricultural Research (ACIAR). The project reached over 10,000 farmers in the Ayeyarwady and Bago regions. From 2017-2021, IRRI is implementing the project 'Development of Rice Fish Systems (RFS) in the Ayeyarwady Delta, Myanmar (MyRice-Fish)'. The target townships are Myaungmya, **Maubin**, and Letpadan. The overall aim of the project is to improve productivity and profitability of rice-fish systems in Myanmar, with a focus on favourable agro-ecological zones in the Ayeyarwady delta.

Furthermore, from 2017-2020, IRRI has implemented the 'Closing Rice Yield Gaps in Asia' project (**CORIGAP-PRO**). The project has co-developed science-based tools to close yield gaps while protecting the environment. The project is implemented in Bago (Letpadan, Hlegu) and Ayeyarwady region (Myaungmya, **Wakema** and Einme). Field sites were established in six villages to demonstrate improved land preparation, benefits of quality seeds, direct seeding via drum seeder and mechanical transplanter, community actions for rodent management, site specific nutrient management, weed management and improved post-harvest practices. From 2017-2020, IRRI has provided technical assistance under the World Bank's Agricultural Development Support Project (**ADSP**) and its Component 2 'Farm Advisory and Technical Services'. The project is implemented in Bago, Naypyidaw, Mandalay, and Sagaing regions. In Bago region, the project site is Swa Chaung dam in Yedashe township, Taungoo district.

IRRI is currently implementing the 'Co-designing Myanmar's Pathways for Agroecological transition towards Sustainable food System (CoMPASS)' project, funded by SDC, from 2019-2022. The project is implemented in different agro-ecological regions of Myanmar, including Ayeyarwady Delta, Naypyidaw, and Mandalay. The main goal of this study is to design pathways for agroecological transition towards sustainable food systems by assessing the production systems interventions, institutional policies, and incentives that can be promoted to create synergies between livelihoods and the environment. A tool is being developed to assess the food production system based on elements of agroecology and sustainability indicators for rice production. In Ayeyarwady region, the project is operating in Myaungmya which is also one of the sites of the Rice-Fish and CORIGAP projects.

The RiceAdapt project will collaborate closely with IRRI in order to build on their past projects and coordinate with ongoing initiatives in the area of research and development, rice-fish, and agroecology, in particular in Wakema and Maubin townships.

5) Wildlife Conservation Society (WCS)

WCS has been conducting biodiversity surveys and SRP pilots in Maubin and Wakema townships (two major sites of the threatened Sarus Crane). WCS has secured funding from the UK Darwin Initiative for a 3-year project on SRP and associated biodiversity monitoring, starting in September 2020. The project is similar to the SRP project that WCS is currently implementing in Cambodia. In Myanmar, WCS has among others:

- ? Translated the SRP standards into Burmese language.
- ? Hosted a study tour for agriculture department, local government, and farmers representatives to visit the Cambodia SRP trials.
- ? Established a Community conservation group in Shwe Laung, called the ?Kyone Kapin Tap Seik? Community Group.
- ? Mapped the land in this area, as a baseline for mapping land-use change, and for identifying factors supporting the high density of cranes in this area.
- ? Developed a partnership with the Maubin University (Zoology Department) to support research on wetland ecology and impacts of changing agricultural practices.

The RiceAdapt project will build closely on the achievements and lessons learned of the WCS SRP pilot, and will collaborate closely with this project in Maubin and Wakema townships for scaling and replication of SRP, as well as implementation of nature-based solutions.

6) LIFT and related initiatives

The Livelihoods and Food Security Fund (LIFT) is a multi-donor fund established in 2009 to improve the lives and prospects of smallholder farmers and landless people in rural Myanmar. LIFT aims to strengthen the resilience and sustainable livelihoods of poor households by helping people to reach their full economic potential.

Since 2008, in the aftermath of cyclone Nargis, several NGOs have implemented projects related to climate-resilience rice production and rice value chain in the **Ayeyarwady Delta**, in particular under the LIFT Delta 1, 2 and 3 programs. These organizations include Welthungerhilfe (WHH), GRET, IRRI, Mercy Corps, World Vision, Proximity Designs, AVSI, Radana Ayar and other NGOs. The main project areas have included Bogale, Mawlamyinyun, Pyapon and Labutta townships, which are situated along the coast and were the most affected by cyclone Nargis.

Among the most relevant projects funded by LIFT are the following:

- (1) Support to Rice Seed Sector Development (RSSD) project, implemented by WHH and Wageningen University (ending in 2020).
- (2) Delta Rural Intensification for Sustainable Economic Development (Delta RISE) project, implemented by a consortium of GRET and WHH (ended in 2019).

Some relevant outcomes and outputs of LIFT-funded activities, upon which the RiceAdapt project can build, include:

- (1) Collaboration between DOA, DAR, private sector and farmers for Registered Seed and Certified Seed production, including through Contract Farming.[102]¹⁰²
- (2) Experience with farmers' organizations, collective actions and financial services (including hire purchase schemes, inventory credit).
- (3) Participatory Guarantee Schemes (PGS), PGS Network.
- (4) Participatory varietal selection (PVS).
- (5) The Delta Livelihood Network, a multi-stakeholder platform to disseminate knowledge and information and to foster engagement between private sector and farmers' organizations.[103]¹⁰³
- (6) Studies on different value chains of importance in the area such as rice, duck, vegetables[104]¹⁰⁴, and lessons learned such as on quality seed production, contract farming, home gardening, and post-harvest technologies.[105]¹⁰⁵
- (7) Up-to-date studies on (i) rice seed supply and demand system[106]¹⁰⁶; (ii) farm production economics[107]¹⁰⁷; (iii) off-farm business activities and livelihoods[108]¹⁰⁸; (iv) contract farming[109]¹⁰⁹; (v) public-private partnerships[110]¹¹⁰; and (vi) impact of COVID-19 on smallholder farmers and rural livelihoods in the Ayeyarwady Delta[111]¹¹¹.

The RiceAdapt project will build on LIFT's efforts in promoting sustainable livelihoods in the targeted regions, in particular with regard to quality seed production, value chains and sustainable livelihoods. The project will also utilize LIFT's guidance for Conflict-Sensitive Programming and apply its Conflict Sensitive Principles, to build sustainability and resilience into implementation and beyond project closure.

7) Agroecology

Agroecology is the science of applying ecological concepts and principles to manage interactions between plants, animals, humans and the environment for food security and nutrition.[113]¹¹³

The NGO GRET has supported farmers in 66 villages of Bogale and Mawlamyinyun townships to implement agroecological practices that help build resilience and increase yields, such as composting, Indigenous Effective Microorganisms, green manure, biopesticides, quality seed production and PGS, and adapted System of Rice Intensification (SRI). Furthermore, GRET is coordinating the Agroecology Learning Alliance in South East Asia and in Myanmar and is supporting capacity development of extension services.[114]¹¹⁴

FAO, at the global level, has developed the Tool for Agroecology Performance Evaluation (TAPE)[115]¹¹⁵, which assesses agroecological conditions and transitions in the following ten core dimensions:

1. Secure land tenure (or mobility for pastoralists)
2. Productivity (and stability over time)
3. Income (and stability over time)
4. Added value
5. Exposure to pesticides
6. Dietary diversity[116]¹¹⁶
7. Women's empowerment
8. Youth employment
9. Agricultural biodiversity
10. Soil health

The RiceAdapt project will build on the lessons learned of GRET projects and will replicate and scale out successful agroecological approaches for climate resilience in the target townships. Furthermore, it will integrate TAPE in the curriculum of the FFS interventions and use elements of TAPE in the monitoring systems developed by the project.

Despite this large number of relevant baseline initiatives and investments in the target regions, in particular the Ayeyarwady Delta, important gaps remain. Due to the limited number of government staff, limited resources, and the large number of villages and village tracts in each township with sometimes difficult access/long distances, only a limited number of townships, villages and village tracts (and farmers within these villages) have been reached by these initiatives. A large portion of donor funding has been focused on the coastal townships that were most affected by cyclone Nargis. Moreover, several consecutive interventions are needed to develop long-term and durable capacity at the regional, township and village level. A wide range of climate-resilient technologies and approaches have been tested in various townships, but they require additional funding to reach a wider area. GEF incremental funding will be used to consolidate and scale out these past successful interventions. This support to be provided will further develop the capacity of local stakeholders and institutions to promote resilient rice-based livelihoods.

Please also refer to Section 6.b *Coordination with other relevant GEF-financed projects and other initiatives* for other GEF projects and relevant initiatives.

- 3) Proposed alternative scenario with a brief description of expected outcomes and components of the project and the project's Theory of Change

The project's alternative scenario is to increase climate resilience and adaptive capacities of vulnerable rice-producing communities in the Ayeyarwady Delta and Bago-Sittaung River Basin by applying an ecosystem-based and market-driven approach. The project aims to improve livelihoods through diversification, income-generating and value-adding activities by improving the enabling policy and institutional environment, promoting climate-resilient farming practices, and improving the resilience, efficiency and profitability of rice and other commodity value chains. The project will promote adaptation technologies and nature-based solutions to strengthen the resilience in production systems and reduce vulnerability to climate risks and hazards. The project will also promote a market-based approach to improve climate resilience through the engagement of local and international private sector and will enhance resilient livelihoods of the targeted communities through agribusiness and small-scale enterprise development.

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The project is fully aligned with priority actions and intervention areas identified in the MCCSAP, the Climate Smart Agriculture Strategy, NAPA priorities and Myanmar's NDC. Through an integrated approach to strengthen resilience in landscapes and livelihoods in rice-based communities in Myanmar, the project will target the following key aspects:

Adaptation mainstreaming: The project will enhance institutional coordination mechanisms; strengthen the capacity of actors at various levels; and increase the integration of climate change adaptation and disaster risk management into sectoral plans and policies.

Resilient livelihoods: The project will identify and strategize actions for climate-resilient rice and other agricultural systems; improve the adaptive capacity of smallholders, marginalised and women-led households in climate-sensitive geographic areas; increase skilled human resources including through improved extension services by public and private sector; improve access to adaptation technologies and practices at production level and along the entire value chain.

Nature-based solutions: The project will recognise and help to realise the potential of natural systems to contribute to resilience to the effects of climate change and climate-related natural disasters, such as the effect of natural wetlands and grasslands in buffering storms and floods and the effects of riverine forests in protecting against river flood impacts. Agroecological concepts will guide the design of project interventions and good agroecology-based practices will be promoted as part of Farmer Field Schools (FFS) and other capacity building interventions.

Market-based solutions: The project will help to increase climate investment including from private sources; strengthen the financing framework for climate-resilient rice; foster micro, small and medium-sized enterprise (MSME) and agribusiness development in the rice sector and through diversification; scale up incubator/accelerator support for innovations; encourage multi-stakeholder partnerships for innovations, technology transfer and implementation of adaptation technologies. Mechanisms such as contract farming, Participatory Guarantee Systems (PGS) and sustainability standards (e.g. SRP Standard) will be used to link farmers to markets for premium quality rice and promote climate-resilient, sustainable and profitable rice production.

Theory of Change

The project's Theory of Change is summarized in Figure 20 below. The project's objective is to enhance the resilience and adaptive capacities of vulnerable rice-producing communities in the Ayeyarwady Delta and Bago-Sittaung River Basin in the face of climate change through an ecosystem-based and market-driven approach. The project will increase the resilience and adaptive capacity of 90,000 women and men in the target landscapes, will bring 57,000 ha of agricultural landscapes under climate-resilient management, and will ensure that ecosystem services in these landscapes are

maintained or enhanced. This will be achieved through a set of outputs that lead to expected short-term, intermediate and long-term outcomes.

First, it is anticipated that by creating mechanisms for improved cross-sector coordination, by implementing capacity building programmes and establishing a Climate Change Education Center, and by incorporating adaptation priorities into agriculture sector policies and plans, national and local stakeholders and institutions will have increased capacity to plan and implement climate change adaptation. This capacity will also be supported by targeted local capacity building on adaptation planning and agromet services, and by conducting local climate risk and vulnerability assessments and participatory prioritization and design of adaptation options. Through farmer field schools, demonstration, strengthened extension services and field implementation support, it is anticipated that the provision of advisory, education and extension services (including agromet services) to farmers will be improved. Participatory research/variety selection and quality seed production will lead to improved availability of high-yielding and stress-tolerant rice varieties. The planning and implementation of nature-based solutions and water management across the landscape will enhance ecosystem services and resilience, including buffering against floods and storms.

Furthermore, it is anticipated that by establishing value chain networks for selected value chains, by strengthening capacities of cooperatives, SMEs (or MSMEs) and farmer organizations, and by promoting women and youth entrepreneurship, the capacity of farmer organizations, cooperatives and businesses to support resilient livelihoods will be improved. Similarly, through implementation of climate-resilient grain storage facilities and processing technologies and through contract farming and partnerships, farmers' access to markets, credit, technologies, and services will be improved. Access to high quality seeds will also be improved. As a result of this -and in particular through the adoption of good practices in compliance with the SRP Standard-, it is anticipated that farmers (women and men) in the target landscapes will apply sustainable, resilient and diversified farming practices. There will also be improved processing and reduced post-harvest losses, and nature-based solutions will be applied across the target landscapes to enhance ecosystem services and resilience. Increased knowledge sharing, including farmer-to-farmer exchange, and improved M&E systems will further contribute to amplifying the above outcomes.

Ultimately, it is anticipated that these short-term and intermediate outcomes will lead to (i) increased productivity and quality of smallholder agricultural production, (ii) increased incomes, household economic resilience, and nutrition and food security, and (iii) reduced land degradation, increased biodiversity, and resilient, healthy ecosystems.

The Theory of Change builds on significant baseline investments. The majority of the proposed interventions have already been or are currently being tested in the target regions, but have not yet been scaled out as this requires time and incremental support. In particular, the project builds on the momentum of first SRP pilots in Myanmar along with a set of recently introduced policies and strategies supporting climate-resilient/smart agricultural development. It also builds on capacity

developed under the CSA Centre as well as farmer field school (FFS) curricula and handbooks developed by previous projects. The project draws upon significant baseline investments that support community-based disaster risk reduction as well as sustainable agricultural development (including infrastructure development). However, these baseline projects have not yet fully reached the target townships. In the project, the SRP Standard will be used as one key approach within a set of capacity building interventions, most notably the Farmers Field Schools, aimed at strengthening community resilience, including diversification, agroecology, nature-based solutions, early warning and forecasting systems, community-based adaptation planning, and linking farmers with agribusiness service providers.

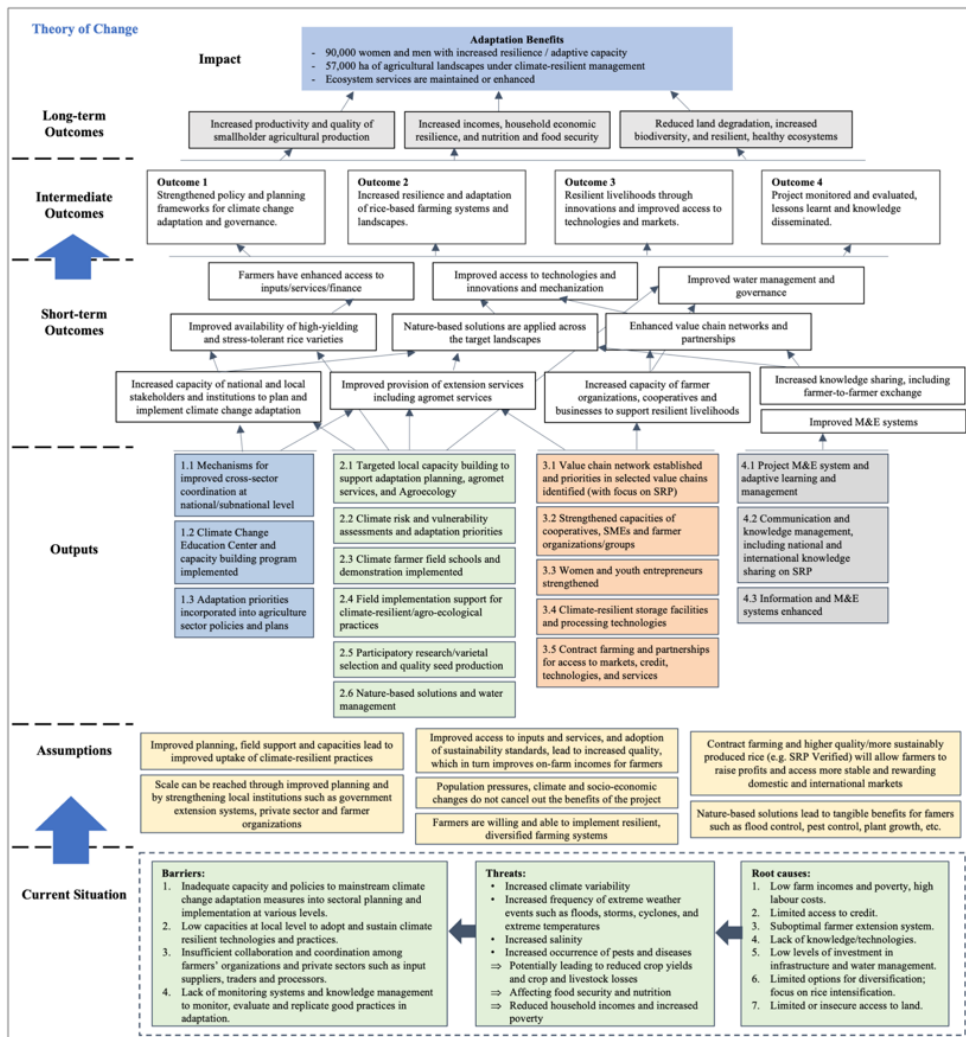


Figure 20: Theory of Change

Assumptions

The Theory of Change is based on a number of assumptions. First, it assumes that improved planning, field support and capacities of national and local stakeholders lead to improved uptake of climate-

resilient practices. The Theory of Change also assumes that scale can be reached through improved planning and by strengthening local institutions such as government extension systems, private sector and farmer organizations. As highlighted in the GEF-5 SLM Project[117]¹¹⁷, the FFS approach is seldom replicable or upscalable by government extension services alone; thus, a more integrated approach involving development of capacities among various stakeholders and institutions is required. Furthermore, it is assumed that improved access to inputs and services and adoption of sustainability standards by farmers lead to increased production efficiencies and higher product quality, which in turn improves on-farm incomes for farmers. Based on early lessons from SRP pilots in Myanmar and elsewhere, the Theory of Change is based on the premise that enhanced efficiencies, raised productivity, increased grain quality and stable access to markets rather than necessarily a premium price, are the main realistic incentives for farmers to be expected from the adoption of good practices in compliance with the SRP Standard.

Another assumption is that farmers in the target townships are willing and able to implement resilient, diversified farming systems; and that they are able to sustain and even scale practices after the project ends. Farmers are likely to adopt new practices if they lead to (i) increased access to technical assistance, credit and inputs in the short term, (ii) reliable contracts/purchase guarantees, and (iii) increased productivity/quality and net income; and, importantly also, if they do not lead to increased labour costs. Based on experiences of recently completed projects and studies, it is also assumed that contract farming and strengthened value chain networks and farmer organizations lead to improved access to services and markets.

Moreover, it is assumed that the nature-based solutions implemented by the project lead to tangible benefits for farmers, such as flood control, pest control, increased soil fertility and thus yields, etc. in order for them to be sustained, and potentially replicated, in the future. Lastly, the project assumes that population pressures and climate and socio-economic changes, as well as impacts from COVID-19, will not cancel out the benefits of the project, meaning that there won't be significant pressures on natural resources (such as groundwater) or surrounding ecosystems (such as forests, grasslands and wetlands) from agricultural expansion, climate change or socio-economic changes that would undo the incremental improvements realized by the project.

Based on the future climate scenarios presented in the baseline section, it is assumed that incremental adaptation, rather than fundamental or transformational change, will be necessary to create resilient rice-based livelihoods in the target areas. Interventions will be based on 'no regrets' options, i.e. options that will be beneficial irrespective of the climate scenario. For this to hold true, the project will ensure that the promoted diversification options are viable under future climate scenarios; and that any new infrastructure/facilities and machinery introduced by the project are climate-proof, i.e. that they are able to withstand extreme weather events. Also, capacities will be developed among stakeholders and institutions for adaptive planning and management, and for continuous and incremental learning.

The project's components, outcomes and outputs are described below. The detailed activities can be found in the work plan in [Annex H](#), and the detailed indicators and targets in [Annex A1](#).

Component 1: Enhancing the enabling environment for climate change adaptation mainstreaming in the agriculture sector through integrated policies and planning

Targets for Component 1, Outcome 1 include:

- ? At least 1 national/subnational cross-sectoral coordination mechanism in place (depending on the outcomes of the consultations)
- ? 150 agency staff and other stakeholders trained on climate change adaptation planning and implementation (at least 40% women)
- ? Climate Change Education [and Policy] Center established and operationalized
- ? Climate change adaptation or related resilience-building measures^[118] mainstreamed into 1 national and 6 region/township level policies, plans or development frameworks

This component will seek to strengthen policy and planning frameworks for climate change adaptation and governance at national and/or subnational/local level (*Outcome 1*). The project will strengthen the capacity of national/sub-national/local institutions to integrate climate change actions into their programming and planning frameworks. Cross-sectoral coordination in climate change adaptation and agriculture will be improved at national and subnational levels (*Output 1.1*). The project will support the establishment of national and/or regional/local mechanisms (forums, committees, etc.). These mechanisms should be linked with existing climate change coordination mechanisms such as the NECCCC or TWG. In particular, this will involve strengthening coordination between agriculture and environment sectors and coordination with the Department of Meteorology and Hydrology (DMH). Where relevant, data sharing agreements between national entities involved in the collection, production and analysis of climate and agricultural data will be formalized (such as MOALI, DMH, the Department of Disaster Management and national research institutions).

LDCF resources will support the establishment of a Climate Change Education Center to enhance knowledge, capacity and awareness at various levels (*Output 1.2*). The Center is expected to be hosted by MONREC and co-hosted by MOALI. The Center will be implemented in close collaboration with the Ministry of Education, DMH and other relevant agencies. The Center will be located in Naypyidaw but will be closely coordinated with the MONREC/MOALI regional offices, DRD training and knowledge centres and the CSA Centre at Yezin Agricultural University (YAU) for regional outreach. It will aim to consolidate and integrate efforts of various sectors in raising awareness and developing capacity for adaptation planning. Additionally, the Center will also play a policy development/advisory role. The Center will provide education to various stakeholders through strengthening existing Climate Change Division of ECD, with the targeted inclusion of women in planning and delivery of its

activities. It will ensure outreach to the region/state level through existing regional training centres (such as DRD, DOA, etc.). The Center may also host selected Training of Trainers activities in support of the outputs under Component 2. The Center should therefore also enable easy access to fields and rice landscapes to conduct surveys and to practically learn about/develop skills for growing crops/develop integrated/diversified rice-based farming systems as part of action research, demonstrations and training interventions (see Outputs 2.1 and 2.3), including those aimed at development of Climate Farmer Field Schools (CFFS) implementation capacity. Linkages will also be established with the Central Agriculture Research and Training Center (CARTC) in Hlegu, Yangon. The Center will seek collaboration with the GCF Chindwin River Basin and the RCDP projects. A Center Supervising Committee and Working Committees equipped with a long-term plan and sufficient and sustainable finance (both international support and state/regional and/or national climate budget in accordance with the MCCP) will be put in place. Annual progress monitoring and evaluation will be conducted.

Capacity building efforts under Output 1.2 will be focused on enhancing capacities of national and subnational stakeholders to implement national climate change related policies such as the MCCSAP, the Myanmar Climate Change Strategy, the AAPDRR and the CSA Strategy. Sustainable Food Systems/Nutrition will also be incorporated, in line with the Voluntary Guidelines on Food Systems and Nutrition.^[119]¹¹⁹ Additionally, under close involvement of DMH, stakeholders will be trained on the use of climate data and information on agricultural decision making, and on the provision/user-friendly presentation of data and information for use by local stakeholders. The agromet services should include alerts for plant pests and diseases (and livestock diseases), combined with integrated pest management approaches that are grounded in agroecological understanding of field situations^[120]¹²⁰. Capacity will also be developed to plan, monitor and evaluate implementation of national and subnational plans and strategies related to climate change. Furthermore, stakeholders will be trained on the use of tools such as FAO's Modelling System for Agricultural Impacts of Climate Change (MOSAICC) and Agro-Ecological Zoning (AEZ) as well as other relevant FAO normative planning and assessment tools (e.g. TAAS/TAPE), in order to enhance the country's capacity to understand and adapt to the impacts of climate change in agriculture with a more long-term view. Additional topics for training modules may include Agroecology/IPM, contract farming and index-based crop insurance, to support existing public and private efforts in these areas. The Climate Change Education Center may include practical demonstration units such as agromet stations, soil and water quality laboratory or demonstration, etc. The Center will also serve as a training and awareness hub for a wider group of stakeholders from sectors other than environment and agriculture, such as the media, the Ministry of Education (students and teachers from primary to universities), NGOs, and CSOs, including consumer groups^[121]¹²¹. In developing capacity for agromet/hydrological and climate advisory services, the GEF-7 project will collaborate closely with the planned GCF Chindwin River Basin project.

With regard to climate advisory, early warning and agromet services, the Climate Change Education Center will collaborate with DMH and several stakeholder organizations such as DOA, General Administration Department (GAD), DRD, Settlements and Land Records Department (SLRD), IWUMD, etc. The project will support the following activities:

- Trainings in utilizing forecast information of various time scales from DMH for DOA staff, staff and line agencies in the project areas.
- Capacity building of farmers through Climate Farmer Field Schools (CFFS) in the target townships.
- Access of Irrigation Department to flood model outputs in DMH, for utilization in water resources management.
- Availability of agromet bulletins on DMH website and other media, for enhancing farmers' understanding of forecasts/bulletins ? to translate the information provided by DMH to understand the farmers level.
- General improvements in the end-to-end information communication system.
- Provision of agromet equipment and services to township/district DOA.
- Establishment of mechanisms for sending advisories, to farmers and other stakeholders, through SMS system.
- Development of information materials on seasonal preparedness and sharing to stakeholders in districts, townships and farm communities.
- Development of new and smart use of existing mobile applications, including for disseminating/communicating technical information and advisory services to farmers and for purposes of enhancing awareness among the general population.

Finally, the project will also support stakeholders to incorporate climate change adaptation priorities into agriculture sector related policies, plans or development frameworks (*Output 1.3*). These frameworks may include, but are not limited to, national agricultural policies, regional agricultural development plans, and township investment/ development plans. Policy dialogues and inter-institutional/sector dialogues will be organized (under the lead of the Climate Change Education Center) to bring important issues to the attention of policy makers, parliamentarians and other stakeholders. Support may also be provided to policies related to the enabling environment such as for strengthening financial incentive mechanisms, access to credit, policies related to land use/crop diversification/land tenure/cross-sectoral land use planning, nature-based solutions, strengthening private sector involvement in farmer support services such as seed production and mechanization, etc. The RiceAdapt project will also support the continuation of the ongoing policy work to support protection/reduce conversion of mangrove forests on Vacant, Fallow and Virgin (VFV) land, and continue to raise awareness among policy makers on the importance of conserving mangrove areas and avoid further conversion of mangrove forests into rice growing areas.

Component 2: Promoting resilience and adaptation in rice-based farming systems, communities and landscapes

Targets for Component 2, Outcome 2 include:

- ? 120 local public and private institutions staff trained
- ? 24 participatory climate risk and vulnerability assessments conducted, with adaptation measures prioritized
- ? 4,500 women and men (approx. 30-40% women) reached by Climate Farmer Field Schools and/or field demonstrations
- ? 1,890 farmers can claim to work towards sustainable rice cultivation and 567 farmers can claim to have produced SRP Verified rice in full compliance with the SRP Standard requirements.
- ? 90,000 women and men (approx. 50% women) with access to improved climate information systems
- ? 22,500 women and men (approx. 50% women) adopting climate-resilient/agroecological practices, including through diversification and options/livelihood improvement for landless households
- ? 5 new stress-tolerant varieties tested
- ? 9,000 ha of agricultural land under climate-resilient management as a result of the project (including agroecological practices
- ? 48,000 ha of rural landscape managed for climate resilience

This component will seek to increase the resilience and adaptation of rice-based farming systems, communities and landscapes in the target regions (**Outcome 2**). First, in coordination with the capacity building efforts under Component 1, the project will implement targeted capacity building for local public and private institutions on facilitating local adaptation planning and implementation (*Output 2.1*). Government extension staff, private extension workers, lead farmers in agricultural cooperatives and SMEs (or MSMEs) will be trained in adaptation measures, creating a core of highly qualified staff which can pass on this knowledge to other extension workers and farmers. In addition to DOA extension officers, the project will involve private extension service providers as well as, where appropriate, master farmers that can support government efforts. The capacity building will also cover the provision of agromet services/agro-climatic information, Agroecology/TAPE, the use of ICT tools such as agri-mobile apps, and the effective delivery of extension services. Additionally, the training will also cover the methodology for rapid climate risk and vulnerability assessments (RVAs) to be implemented under Output 2.2.

Second, the project will conduct participatory agroecology and climate risk/vulnerability assessments in selected villages of the target townships, and will support communities to prioritize adaptation measures (*Output 2.2*). The village selection initiated during the project design phase will be confirmed with regional/local stakeholders and approx. 24 ?core? villages and 66 ?outreach? villages will be selected based on the defined criteria. The agroecology (TAPE) and risk and vulnerability assessments (RVAs) will be community-based rapid assessments. They will build on existing vulnerability assessments in the target regions (such as from MCCA, UN Environment GEF-5 LDCF, DRD disaster modelling) and will aim to validate preliminary findings identified during the project preparation phase.

These assessment at community-level, TAPE in particular, are also intended to set baselines and inform curriculum development for the Climate Farmers Field School. Progress on rural communities' transition towards greater adoption of agroecological practices following CFFS interventions will be assessed at regular intervals and inform participatory action planning and facilitate design of follow up training interventions. These community-based assessments will also generate valuable information and data for purposes of M&E and impact assessment. Local institutions including local government, DOA, DRD, local village committees, farmers groups, etc. will be closely engaged in the process, and synergies with the existing Village Development Planning (VDP) process will be sought. Based on the priorities identified by the communities, the planned activities under Components 2 and 3 will be adjusted for each village, and a detailed implementation plan developed. For those identified priorities that cannot be directly supported by the project (such as farm road development or land levelling), linkages with other initiatives and funding sources will be sought. In prioritizing the activities, the project will ensure the active participation of vulnerable groups such as landless households, women-led households, and the poor. COVID-19 considerations will be incorporated into the design of the vulnerability assessments and adaptation measures, to ensure farming systems and value chains are resilient to any similar shocks in the future.

The project will then implement Climate Farmer Field Schools (CFFS) and field demonstrations to support the adoption of innovative climate-resilient/agroecological practices in the target villages (*Output 2.3*). Quality and sustainability standards such as GAP and SRP will be used as a framework for the CFFS curriculum to promote and provide education on climate-resilient/agroecological practices. Among others, these climate-resilient/agroecological practices include:

1. Zero/minimum tillage aligned with Conservation Agriculture
2. Biomass recycling, mulching and management of soil health
3. Integrated Crop Management, included Integrated Pest Management (IPM) and Integrated Nutrient Management
4. Adapted System of Rice Intensification (SRI) and/or Direct Seeded Rice (DSR), combined with mechanization
5. Organic farming
6. Quality seed production
7. Water management, including promotion of Alternate Wetting and Drying (AWD)
8. Integrated soil/land management to improve the soil fertility/organic content, such as use of organic fertilizer, rice straw incorporation, nutrient interception, etc.
9. Integrated farming systems work, e.g. rice-fish, rice-duck, rice-vegetables.
10. Harvest and post-harvest management

The season-long CFFS will also include modules on the use of early warning systems and agromet services to help farmers in decision-making; the use of agri-mobile apps; and integrated pest management/pest early warning and advisory systems. The CFFS will incorporate on-farm diversification approaches (such as seasonal rotation, cover crops, rice-fish-duck systems, integrated

farming system, vegetable gardens to improve household nutrition and incomes, improved use of rice straw for mulching and as animal feed, etc.). These approaches will be demonstrated within context of season-long CFFS field experiments and other project-supported demonstrations and scaled up to improve resilience, particularly of women and women-led households and the landless, against climatic variations, improve soil fertility, increase income and improve food security and nutrition. The CFFS curricula will be designed in flexible modules that can be adjusted based on actual field realities and the priorities identified in each village at various stages during the crop production cycle.

Agroecosystem Analysis (AESAs), a guided and field-based educational process to develop skills for agroecology-based crop management, will be the core of the daily FFS curriculum and continue at weekly interval throughout the season-long CFFS intervention. The SRP Standard and associated requirements will guide curriculum development for each and every CFFS session. When selecting approaches to promote crop diversification, attention will be paid to synergies with rice production and the presence of markets for the crop or farm product as well as labour availability/high labour costs at farm level. Farmers will be encouraged to keep farmer records and supported to conduct cost-benefit analyses of the proposed management interventions and overall farming operations. Furthermore, the CFFS will also allow for space to incorporate traditional knowledge and practices, where and whenever relevant. Educational activities related to nutrition, such as on the importance of legumes/pulses and aquaculture for nutrition and a balanced diet, will also be incorporated.

Local volunteer 'master/lead farmers' will be identified to ensure continued follow up throughout the planting season. Master farmers from earlier projects such as those implemented by GRET, IRRI, Helvetas and WHH will be invited to share experiences, in particular on the use of the SRP Standard for training purposes. Local demonstration plots will be established to pilot agromet stations, conduct trials of new varieties, and explore pest and disease management through NBS-approaches. Interventions under this Output will be closely linked with interventions under Component 3 on strengthening quality seed production, selection of varieties, water management, mechanization, post-harvest technology, and the application of the SRP standard.

Based on the CFFS and in line with the prioritized adaptation measures, the project will provide field implementation support to local farmers (including women and vulnerable groups) to adopt climate-resilient/ agroecological practices, including through diversification and options/livelihood improvement for landless households (*Output 2.4*). The field implementation support will be closely linked with extension services and other farmer support systems to ensure its sustainability and long-term follow-up. Such support systems include DOA extension officers, call centres, and e-extension system established under the KOICA project, relevant agri-mobile apps from private service providers, private extension officers and service providers, as well as NGOs present in the area. Capacity building will be provided on the use of ICT tools and apps, in particular for women and landless. Field implementation support may also involve soil and water quality testing for improving nutrient and water management as well as for risk mitigation strategies related to heavy metals in soils (a key requirement of SRP). For landless households (in particular, female-headed households), the project may support livestock raising, small-scale aquaculture ponds, vegetable gardening, etc. to enhance food security and nutrition and increase household incomes. Small-scale mechanization options will also be introduced (in coordination with Component 3) to reduce drudgery and labour-inputs in farming operations while generating a diversified source of income for landless households. Mechanisms for replication will be identified, such as the provision of support by project beneficiaries to additional

farmers not directly supported by the project. Also under this Output, the project will conduct more detailed surveys on the use of highly hazardous pesticides in the target townships. It will then assist DOA in developing township-level IPM and pesticide risk reduction action plans and implementation/M&E thereof, including waste (containers) management aligned with SRP Standard requirements.

Furthermore, the project will implement participatory research/participatory varietal selection of stress-tolerant varieties, along with quality seed production, in collaboration with DOA/DAR research farms (*Output 2.5*). With support from IRRI, the project will assist DAR in conducting trials and enhance national capacity for breeding, testing and releasing climate-resilient varieties. The project will also link with ongoing trials of rice (and potentially other crop) varieties in the target areas, and will carry out participatory research in selected demonstration plots (DOA/DAR research farms and farmer fields) with participating farmers. This will involve testing the varieties' effectiveness in increasing yield and reducing the need for pesticide, as well as their tolerance to floods, drought and salinity. Market actors will also be involved in the trials to ensure that the developed varieties respond to market demand. The project will support quality seed production in collaboration with DOA/DAR, private sector, and farmers' groups (in coordination with Output 3.2 and building on relevant previous initiatives). The use of MOALI's Quality Seeds application and the Myanmar Rice Portal will be promoted. In addition to rice seeds, this will also involve strengthening the grain legume/ pulses seed systems.

Apart from efforts to develop and promote the use of salt-tolerant and improved rice varieties released by DAR, the RiceAdapt project will support the selection of farmer's traditional flood-resistant and saline-tolerant rice varieties. Selected varieties will be multiplied under the certified seed program and distributed again to the salt-affected areas. The training program for farmers involved in seed production will be designed as Farmer Field School (FFS) in accordance with the growth stages of rice from sowing to harvesting in a season. Project activities will be conducted in close collaboration with DAR, and Seed Division & Extension Division of DOA and private seed companies.

Lastly, the project will develop capacities in the target communities for identification and application of nature-based solutions (NBS) and improved management of water, through strengthening of community governance and organization (*Output 2.6*). These measures will be in line with the prioritized adaptation options from Output 2.2 and may include measures to strengthen flood control, stabilize riverbanks, increase vegetation in farmland boundaries for pest control and pollination, etc. The project will support the establishment and enhance capacity of community organizations such as village committees and Water User Groups. Water management may be improved by strengthening community governance through Water User Groups, and/or by rehabilitating drainage and irrigation infrastructure. Improved water management will be guided by the vulnerability assessments, and by the agromet services for which capacities are improved under other outputs. Water monitoring data may also be improved where needed. The cost-effectiveness of NBS will be assessed in order to ensure sustainability and replicability of the interventions. Co-contributions from local government and communities will be sought to increase local ownership of the measures. Where relevant, the project will implement participatory land use planning (PLUP) to enhance community governance of land and natural resources.

Table 3: Main climate hazards in the project area and related project interventions based on agroecology and other NBS

Climate hazards	Potential project interventions
Cyclone/strong winds	<ul style="list-style-type: none"> ? Manage plant density, promote balanced fertilizer application and create optimal conditions for development of healthy root systems, including through healthy soil management, application of Alternate Wetting and Drying (AWD) and wider-spaced planting methods as generally promoted through the System of Rice Intensification (SRI). ? Conservation and/or planting of native trees in the rice landscape to act as windbreakers. ? Conservation and/or rehabilitation of coastal ecosystems ? e.g., salt marshes, wetlands and inter-tidal ecosystems.
Intense rain and flood/storm surge	<ul style="list-style-type: none"> ? Plant flood-resistant varieties and improve field drainage facilities, including through strengthening of bunds and better management/regular maintenance of canal/drainage systems. Enhance access to weather forecasts/early warning systems. ? Green infrastructure to help regulate flood waters, store water for recirculation and reduce the level of water runoff. ? Riparian wetland management, grass/vegetated buffer strips and vegetative drainage ditches.
Sea-level rise	<ul style="list-style-type: none"> ? Plant saline-tolerant varieties and apply good practices for soil remediation. Promote integrated farming systems well suited to more saline conditions, such as rice-shrimp.
Increased temperatures, changes in precipitation	<ul style="list-style-type: none"> ? Conserve biodiversity, including plant diversity, and integrity of natural ecosystems. Increase capacity for climate advisory services, Agro-Ecological Zoning. Integrated pest management/pest early warning and advisory systems. ? Trees or shrubs planted principally for soil conservation purposes. ? Water harvesting systems of collectors, drains, sinks and storage ponds. ? Field level NBS such as attractor and repellent plants.

Component 3: Scaling up adaptation technologies and innovations in selected value chains, and improving market access

Targets for Component 3, Outcome 3 include:

- ? 18 cooperatives, SMEs and farmer organizations/ groups trained in identified priority areas (such as quality seed production, Internal Management System (IMS)[122]¹²², SRP Assurance Scheme)
- ? 12 women and youth enterprises established or strengthened
- ? 6 grain storage facilities and/or technologies (such as on-farm drying and storage system[123]¹²³) introduced/ improved that are climate-resilient (for both rice and grain legumes/pulses)
- ? 5 planting/harvesting/ processing technologies introduced/improved to enhance climate resilience (including land preparation and levelling, transplanting, weeding, harvesting, threshing, drying, milling)
- ? 12 contracts / partnerships established that improve access of small-scale producers to markets, credit, technologies, certified seeds and services

This component seeks to enhance the adaptive capacity of local farmers, farmer organizations and private sector through the transfer and deployment of adaptation technologies to improve value addition and supply chain infrastructure for rice and other priority crops, including pulses. Resilient livelihoods will be achieved through innovations and improved access to technologies and markets (*Outcome 3*). As a first step, a value chain network will be established in the target regions and priorities for strengthening resilience in selected value chains identified in a participatory process (*Output 3.1*), including through the use of the SRP Standard. This will build on and revive platforms and partnerships established under earlier projects, in particular the Rice Seed Sector Development (RSSD) and Climate Smart Rice (CSR) Projects (such as the Delta Livelihood Technical Working Group). Opportunities for commodity-specific climate services will be discussed, to strengthen climate services along the rice (or other selected crop) value chain, i.e. for production, harvesting, storage, transport, etc. Companies that provide climate/weather and other advisory services to farmers will also be engaged. Targeted capacity building will then be provided for agricultural cooperatives, SMEs and farmer organizations/groups in identified priority areas (*Output 3.2*). This may involve areas such as quality seed production (through community seed banks or PGS certified producers), Internal Management System (IMS), SRP Assurance Scheme, including Chain of Custody, agromet services, and mechanization. Wherever possible, the project will aim to engage women farmers in these activities (such as for seed production). Where relevant, village mechanization committees will also be strengthened, to enhance community assets and organization and address labour shortages and drudgery. This output will also support further development/field testing of SRP app, conduct data collection for SRP, and provide support to farmers to comply with SRP requirements, such as by facilitating laboratory testing of heavy metals in soils. In line with identified priorities, the project will aim to strengthen women and youth entrepreneurship for increased resilience of rural livelihoods (*Output 3.3*). Areas of entrepreneurship may include seed production, input supply, innovative ICT tools (e.g. the smart-phone based Myanmar Rice Portal application), diversification, value addition for

fishery/crop products, etc. Technical support will be provided for the development of business plans and marketing strategies for rice and other selected products and crops/commodities.

Moreover, LDCF resources will be used to climate proof the supply chain through technology interventions along key stages of the chain. Climate-resilient grain storage facilities and processing technologies will be introduced in the target communities for value addition and to reduce losses (*Output 3.4*). This may involve enhancing mechanization at various stages of production, harvesting and processing (in particular benefiting women farmers); improved drying and milling technologies to enhance quality and preservation; and introducing and upscaling post-harvest and storage technologies to enhance the climate resilience of local supply chain infrastructure and increase the ability of farmers to store their produce and sell at a later stage, when prices are higher. Better storage technologies (for both rice and grain legumes) are particularly relevant and important for managing humidity and keeping stored grains free from pests and diseases at household level. The purchased machinery will be co-funded by local communities or local institutions, with a target of 20% co-financing. Additionally, private sector actors along the value chain will be encouraged to invest in climate-resilient practices and adaptation technologies by sharing good practices and through the enhanced policy environment under Component 1. Technology innovations that integrate renewable energy/energy efficient measures, including off-grid solutions, will be sought where possible to reduce the carbon footprint of mechanization. Local SMEs and producer organizations will also receive training in appropriate post-harvest handling and collection centres will be established in strategic locations.

Finally, the project will work with the various stakeholders of the value chain network to establish contract farming and partnerships between smallholder farmers and local/national/global value chain actors to improve access of small-scale producers to markets, credit, technologies, certified seeds and services (*Output 3.5*). Contract farming between agricultural cooperatives and rice processors will be demonstrated and upscaled to create further incentives for farmers to engage in climate-resilient rice production and reduce incentives for direct selling of paddy. This will simultaneously improve processor's access to high-quality paddy delivered on time, enhancing their access to high-value export markets in Europe, China and elsewhere. Efforts will also be targeted at improving market access and developing marketing systems for diversification of activities to enhance the climate resilience of local SMEs, agro-industries and agribusinesses involved in the production, processing and marketing of rice and related products. Specific priorities will be identified for each township. Working towards full compliance with the SRP Standard requirements will be central in all the capacity building interventions (e.g. the CFFS) supported by the RiceAdapt project at rural community level. Partnerships may include contracts with millers involving the use of SRP standard, provision of extension services and price guarantees, contracts with seed growers for quality seed production, input providers, credit mechanisms, Geographical Indication, and/or climate advisories and services. Furthermore, these actors will be linked with micro-credit institutions and supported in increasing their access to domestic and export markets, through the project's engagement with the SRP and other institutions. Access to credit will be enhanced in collaboration with agricultural development banks, local micro-finance institutions (MFIs) and multilateral development banks (MDBs). Participatory Guarantee Systems (PGS) for climate-resilient and sustainable rice production will be established at selected agricultural cooperatives (such as the establishment of Internal Management Systems in compliance with the SRP standard and associated Assurance Scheme or for quality assurance in seed production). As mentioned earlier, PGS could be developed as an alternative to formal inspection by

DOA for certified seed production[124]¹²⁴, building on the experience of the RSSD and other projects. Finally, PGS can also serve as a mechanism to build trust between producers and consumers, in particular for organic production.

Also under this Output, the project may support public-private partnerships (PPPs), such as for the production of Early Generation Seed (EGS).

Component 4: Monitoring & Evaluation, communication and knowledge transfer

Targets for Component 4, Outcome 4 include:

- ? # of people reached by awareness campaign/ knowledge products/ events (as per communication and knowledge management strategy)
- ? 3 national and international knowledge sharing events conducted
- ? Cross-sectoral national/ subnational M&E system to monitor implementation of Rice Sector Development Strategy, CSA Strategy and related policies in place

This component covers the project's Monitoring and Evaluation (M&E), knowledge management and communications activities. The project will be monitored and evaluated, lessons learnt and knowledge of adaptation innovations disseminated (*Outcome 4*). To achieve this, the component will establish and implement a project M&E system and adaptive learning and management (*Output 4.1*). This will include the preparation of and periodic reporting against project work plans, budgets and indicators, and the organization of the mid-term and end of project evaluations. Based on annual monitoring of project indicators, project stakeholders (at annual Project Steering Committee and/or additional stakeholder meetings) will periodically review the project logframe and Theory of Change, verify the assumptions, and make adjustments as needed. Community-based mechanisms and capacities for monitoring will also be developed, such as for monitoring of the adaptation measures and adaptive planning and management. Baseline and annual M&E household surveys will be conducted to measure the project's impact, in coordination with the TAPE and SRP data collection under Outputs 2.3 and 3.2. The Department of Planning (DOP) of MOALI and other stakeholders (including DOA and DAE) will be involved in monitoring and evaluation in order to ensure that lessons learned will flow into future project developments.

Furthermore, a project-specific communication and knowledge management strategy will be developed and implemented (*Output 4.2*) to ensure common understanding of key project messages and activities, with project results and lessons captured and distilled and made available periodically. National and international knowledge sharing will be fostered, including through the Sustainable Rice Platform

(SRP). Project resources will be strategically used for incubation and accelerator at national as well as regional level through the SRP and other GEF/LDCF projects: sharing of evidence based best adaptation practices/technologies for rice production in Southeast Asia. The project will also build on knowledge, skills and networks developed under previous projects, including the successive LIFT funded projects (e.g. RSSD) in the Ayeyarwady Delta, the SRP pilots by the Climate Smart Rice Project in Bago and by WCS in Ayeyarwady, etc. Exchange visits will be organized to visit farmers involved in these projects, in order to exchange knowledge and learn from their experience. Outcomes and lessons learned will also be shared through events such as rice fairs, farmer-to-farmer exchange, and farmer field days. Farmer organizations such as seed grower associations, will also be engaged in knowledge exchange.

Finally, the project will enhance the country's information and M&E systems to monitor and evaluate adaptation and resilience in agriculture (*Output 4.3*). This will enable national institutions to monitor project outcomes against national targets and the SDGs, and to track progress in implementation of national and subnational agricultural and climate related policies and programmes. The project will first finalize the M&E/Knowledge Management System (KMS) system based on the initial development during PPG, for use in project M&E and data collection. This M&E/KMS system builds on the ICRISAT MEASURE platform (Monitoring and Evaluation of Agri-Science Uptake in Research and Extension), which will be applied in a number of FAO-led GEF projects across the region under the Sustainable Rice Landscapes Initiative (SRLI). It aims to capture indicators at various levels, including the SRP Performance Indicators, FAO's Tool for Agroecology Performance Evaluation (TAPE), national-level indicators, as well as the Sustainable Development Goals (SDGs), as shown in Figure 21 below.

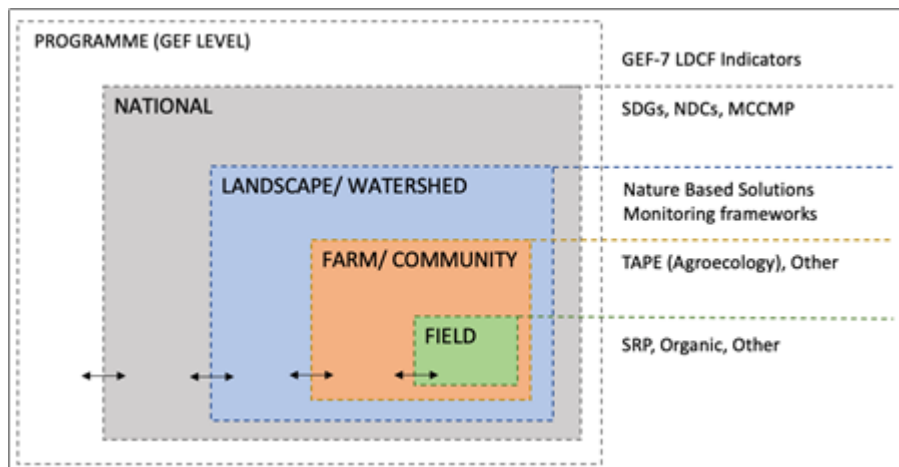


Figure 21: Draft indicator framework for the RiceAdapt project

The platform will: (i) through pre-defined templates, enable the collection of geo-tagged data of the communities, producers, farmers, farmland, value-chain actors, interventions, and capacity building activities in real-time from the source of the data; (ii) enable the collection and aggregation of periodic reports, updates, and information from implementing partners, government and research institutions, NGOs, actors and other stakeholders; (iii) harvest M&E related information from different secondary

sources; (iv) track the indicators and progress in project implementation; (v) provide spatial distribution of the project intervention sites and its adoption; and (vi) provide a web-based, multi-layered dashboard to visualize the reported data both spatially and temporally. The platform customized at the project level will be deployed on a cloud server and will be configured by the country project team to define the templates, user roles, access, and dashboards. The project will aim to establish linkages with existing ICT tools, such as those being developed/used for assessing compliance with the SRP standard.

4) Alignment with GEF focal area and/or Impact Program strategies and FAO's comparative advantage

The proposed project is aligned with the GEF Climate Change Adaptation (CCA) focal area. Accordingly, the project is fully aligned with the goal of the LDCF/SCCF Programming Strategy 2018-2022, through its efforts to strengthen resilience and reduce vulnerability of Myanmar's rice-farming communities and delta ecosystems to the adverse impacts of climate change. In response to the enhanced emphasis on private sector engagement in the LDCF strategy, the project is promoting an ecosystem-based and market-driven approach to build resilience in key ecosystems and to strengthen the adaptive capacities of local private actors and SMEs. More specifically, the project is aligned with LDCF Objective 1: *Reduce vulnerability and increase resilience through innovation and technology transfer for climate change adaptation*, and LDCF Objective 2: *Mainstream climate change adaptation and resilience for systemic impact*.

Additionally, the project is expected to generate co-benefits that contribute to the GEF focal areas of the GEF-7 Programming Directions. With regard to the climate change mitigation focal area, the project will contribute to reducing methane (CH₄) emissions from paddy fields through introduction of good practices for improved water management, including alternate wetting and drying (AWD). Where possible, the project will also promote the uptake of technology innovations for processing that integrate renewable energy/energy efficient measures, including off-grid solutions, to reduce the carbon footprint of mechanization. Such interventions are expected to deliver mitigation co-benefits from reduced CO₂ emissions otherwise associated with inefficient and non-renewable energy consumption.

The project will contribute to the land degradation and biodiversity focal areas through sustainable land practices and by promoting sustainable rice cultivation and diversification strategies, which will contribute to improve the health of the agricultural ecosystems and support the conservation and sustainable utilization of the multiple goods and services provided by such natural systems. The project will also implement nature-based solutions to increase resilience in the wider landscape, including numerous oxbow lakes, marshes, grasslands, mangroves and globally important tidal mudflats. By incentivizing farmers to reduce the use of harmful pesticides, the project will reduce pressure on nearby

protected areas (including both Ramsar sites and Key Biodiversity Areas[125]¹²⁵), thus reducing habitat degradation and contribute to wildlife conservation, including habitats of the vulnerable Sarus Crane (*Antigone antigone*) (in the Ayeyarwady Delta) and the critically endangered spoon-billed sandpiper (*Calidris pygmaea*) (in the Gulf of Mottama). The project will help to conserve and promote the sustainable use of agro-biodiversity through diversification and uptake of climate-resilient and stress-tolerant local varieties, thereby contributing to the ecological integrity and sustainability of the delta ecosystems.

The project will also help to enhance water security and quality in the delta ecosystems through improvements in integrated water resource management and early warning systems. Finally, the project will contribute to improving management of agro-chemicals and their wastes by promoting pesticide risk reduction, including integrated pest management, and the correct application of fertilizers.

FAO's comparative advantage: FAO is recognized globally for its work in addressing the root causes of hunger, food insecurity and malnutrition, including the additional challenges to natural ecosystems and food systems posed by climate change. Drawing from across FAO's organizational capacity, FAO is providing significant technical and policy level expertise to assist Myanmar in addressing priority global environmental and climate change issues nearly all of which relate to FAO's core areas of expertise and work, including agriculture, forestry, and fisheries. FAO has significant experience in assisting the country in implementing sustainable land management (SLM), sustainable forest management (SFM) and sustainable fisheries. FAO focuses much of its country support and field activities on improving agricultural production through sustainable management of natural resources, while addressing new challenges such as climate change. FAO is a well-known source of knowledge and of technical expertise to deploy improved management practices such as conservation agriculture, agroforestry, water management, integrated livestock management, and restoration of degraded lands. Additionally, FAO together with its partners is leading the regional Sustainable Rice Landscapes Initiative (SRLI) and is a member of the Sustainable Rice Platform (SRP).

The project is in line with the following priority areas and outputs of FAO Myanmar Country Programme Framework (CPF) 2017-2022 and regional priority:

Priority Area A: Enhanced food security, nutrition and food safety.

? Output 1.5: Empower smallholder farmers and their organizations through inclusive pro-poor agriculture value chains.

Priority Area C: Enhanced resilience of local communities and farming households to natural and humanitarian disasters, climate change and transboundary and emerging infectious disease risks

- ? Output 3.2: Improved information and early warning systems for natural and humanitarian disasters, food chain crisis and climate change tailored to the needs of local agricultural (crop, livestock, fisheries and forestry) producers especially women and the poor, and
- ? Output 3.3: Vulnerability of farming households and communities to natural and humanitarian disasters and climate change-induced risks reduced through inclusive CBDRR/CBA approaches and climate-smart agriculture practices

Regional Priority: Nutrition and food safety; Inclusive value chain development; and food waste and loss; Regional Initiative on Climate Change; Sustainable Rice Landscapes Initiative.

- 5) Incremental/additional cost reasoning and expected contributions from the baseline, the GEFTF, LDCF, SCCF, and co-financing

Myanmar is a least developed country and has been ranked as the second most vulnerable country in the world to the effects of climate change in 2020.[126]¹²⁶ The risk of climate hazards therefore poses an increasingly severe threat to rural communities whose livelihood depends on the agriculture sectors, particularly in Myanmar's rice farming deltas. The increasing impacts and exposure of climate-sensitive sectors combined with persistent poverty and low capacities to adapt to climate change add to the precarious situation of vulnerable communities in the targeted regions. Moreover, unsustainable land-use practices and use of agro-chemicals, saltwater intrusion, erosion of riverbanks, and loss of mangroves and other natural habitats are eroding the resilience of the landscape, leaving the ecosystem extremely vulnerable to climate change impacts.

In the absence of alternative livelihoods such as diversification, access to markets and diversified income sources and with limited availability of evidence-based knowledge, tools and skills to adopt appropriate adaptation practices and technologies, communities are left with little means to implement resilient livelihood strategies. Without the LDCF intervention, Myanmar's -and in particular the Ayeyarwady and Sittaung delta's- agriculture sectors will increasingly suffer under the impacts of climate change. Agricultural production and livelihoods, particularly the majority of smallholders in rural areas, will remain impacted by a variety of climate hazards.

Without targeted investments and technical inputs, this negative trend is likely to escalate further as climate change impacts continue to increase in intensity and frequency. Moreover, given Myanmar's LDC status, there is limited public financing available to provide the support needed at community level. The LDCF project will assume the risks/additional costs that the adoption of climate-resilient practices implies for farmers. In terms of alternative sources of financing for the project, private investment to support smallholder producers and SMEs in the forms of technology transfer, contract

farming arrangements at scale, etc. is currently unlikely without further support and capacity development that builds on recent achievements/progress in the area. Additionally, due to socio-economic conditions in the targeted regions, smallholder producers and SMEs do not have the financial resources nor access to credit to climate-proof their practices, supply chains and businesses without external support. The proposed technical assistance and investments will therefore not take place without the involvement of the LDCF.

The LDCF project builds on, and is complemented by, the efforts of several ongoing baseline initiatives that operate in the targeted scope and regions (as described in *Section 1.a.2) Baseline Scenario*). The use of LDCF funds will target the margin between the current baseline investments and a climate-resilient development scenario that promotes adaptation technologies and incorporates innovative approaches and practices to enhance community resilience in the target landscapes.

6) Adaptation benefits (LDCF/SCCF)

As explained above, the proposed project is fully aligned with the goal of the LDCF/SCCF Programming Strategy 2018-2022, through its efforts to strengthen resilience and reduce vulnerability of Myanmar's rice-farming communities and delta ecosystems to adverse impacts of climate change. The project's alignment with the first two objectives of the LDCF strategy and consequent adaptation benefits are outlined below.

LDCF Objective 1: Reduce vulnerability and increase resilience through innovation and technology transfer for climate change adaptation. LDCF resources will be used in a catalytic and complementary manner to enhance the resilience of the rice and other agricultural sectors that contribute to the livelihoods of the targeted communities, in particular women and vulnerable groups, including landless households, in a holistic manner. This will be achieved by introducing, testing and adapting selected appropriate technologies and innovative practices as well as associated knowledge and skills to increase the efficiency and profitability of the rice sector while enhancing local capacity for planning and implementation of adaptation measures, including through diversification. Furthermore, the implementation of nature-based solutions and improved water management will decrease pressure and degradation of the deltas and vital ecosystem services that the communities depend upon. More specifically, the project will reduce vulnerability and increase resilience of 90,000 people and 57,000 ha across the targeted regions by promoting the use of improved contract farming, Participatory Guarantee Systems (PGS) and compliance with the SRP standard as well as diversification. These innovative approaches will create incentives for farmers and SMEs to engage in climate-resilient practices and in terms of technology transfer, the project will promote a greater uptake of climate technologies which improve climate resilience in rice production and processing.

LDCF Objective 2: Mainstream climate change adaptation and resilience for systemic impact. The project will lead to the mainstreaming of climate resilience and adaptation into sectoral planning and programming in the targeted regions and townships. At national level, the project will strengthen the capacity of national institutions to integrate climate change adaptation into their programming. At the regional level, lessons learned from the project will be disseminated via communications material, encouraging uptake of successful practices in other projects. The project is also expected to contribute to strengthening regional and global partnerships, innovations and knowledge sharing through its engagement with the SRP. Furthermore, the project will seek to improve a number of enabling conditions for climate change adaptation in the rice sector and in agriculture more generally, including through improved access to credit and quality inputs such as seeds, promotion of nature-based solutions, and national and sub-national capacities in weather forecasting, agro-met services and early warning systems, as well as through diversification strategies.

Additionally, the project will generate global environmental benefits through the optimized use of chemicals, reduced impact on biodiversity, and enhanced community governance of natural resources. By increasing yields on existing land, in combination with relevant policy interventions, the project also aims to avoid further conversion of mangroves and other ecosystems to agricultural land.

7) Innovativeness, sustainability, potential for scaling up and capacity development

Innovativeness

The project provides an innovative approach to community-level climate change adaptation through an ecosystem-based and market-driven approach to build resilience in production systems and value chains and reduce vulnerability to climate change.

The project's market-driven approach is innovative in terms of climate change adaptation, particularly the activities for identifying and introducing appropriate technologies and practices to support vulnerable communities in accessing market opportunities that they are currently excluded from. The project will deliver innovative climate-resilient agriculture practices and technologies to farmers, designed to adapt to increasing hazards such as floods. It will reduce costs and risks associated with the adoption of climate-resilient production systems in the target deltas by removing information, financial and institutional barriers to their adoption. The project's approaches, although already applied elsewhere in the region or globally, are innovative at the local (village, township, or region) level.

This project expands the positive impacts of adaptation technologies and practices tested in Myanmar, by linking these practices with incentive mechanisms that ensure profits from such practices accrue to the producers, as well as others in the value chain. Approaches such as the contracts through PGS and compliance with the SRP Standard requirements connect producers with other value chain actors

including peer farmers' groups, millers, traders and consumers through a process that builds capacity and trust. These mechanisms ensure that standards of sustainable practices are being followed, and market incentives for safe and sustainably-produced food exist to encourage and sustain these practices. The use of the SRP Standard and associated Assurance Scheme itself is innovative, currently being tested in pilot projects across several regions in Myanmar. Finally, the project will promote and facilitate scale out of the innovative ICT tools that have been developed in Myanmar in recent years.

The project is also innovative in terms of fostering inter-agency collaboration at multiple levels and by enhancing the institutions' capacity to plan, monitor and evaluate adaptation in agriculture sectors and providing them with assessment tools such as FAO's Tracking Adaptation in Agriculture Sectors (TAAS) framework, Agro-Ecological Zoning (AEZ) and Tool for Agroecology Performance Evaluation (TAPE).

Sustainability

The proposed LDCF project aims to tackle various scales, sectors and stakeholders in a multifaceted approach that involves national and local government, private sector, farmer groups and organizations, and local communities and community leaders. In terms of developing ownership for adaptation measures among the local communities, participatory approaches will be a key tool in the project planning process, and have been incorporated into the design of Components 2 and 3, in particular.

The project will support agroecological transitions through the adoption of climate smart and sustainable best practices, including Integrated Pest Management and Integrated Nutrient Management, by smallholder farmers. Compliance with the SRP Standard requirements will facilitate the development and scale out of sustainable rice cultivation and provide incentives for stakeholders along the rice value chain.

The involvement of value chain stakeholders at various scales and with a commitment to environmental sustainability and resilience, food safety and quality, and economic benefits for smallholders will create incentives to encourage the adoption of climate-resilient practices and investments in adaptation technologies along the value chain. This will also help to incentivize private sector investments, including for development and adoption of climate-resilient post-harvest technologies. Such links, coupled with enabling policies and alignment with national programmes, will help to ensure sustainability of the initiatives established by the project beyond project closure.

Government extension staff, private extension workers, lead farmers in agricultural cooperatives and SMEs will be trained in adaptation measures, creating a core of highly qualified staff which can pass on this knowledge to other extension workers and farmers. Establishment of a Climate Change Education Center, and with the targeted inclusion of women will also contribute to dissemination of knowledge on climate-resilient practices and agribusiness development, after project completion.

In terms of financial sustainability, existing studies of yield improvements and cost reductions delivered by SRP-compliant farm practices (in terms of gross margins of crop financial budgets) indicate that farmers have a clear financial incentive to undertake climate-resilient practices even in the absence of premium prices. By promoting the uptake of PGS and the SRP assurance scheme, the project will facilitate a steady market for premium quality rice produced in a sustainable and climate-resilient way. Along with access to extension services, agromet services and quality inputs, this will create further incentives for farmers to continue with climate-resilient practices after project completion.

In terms of the sustainability of the Climate Change Education Center, a Center Supervising Committee and Working Committees equipped with a long-term business plan and sufficient and sustainable finance (both international support and state/regional and/or national climate budget in accordance with the MCCP) will be put in place. Annual progress monitoring and evaluation will be conducted.

Potential for scaling up

The project itself will scale up/scale out climate-resilient agriculture practices and technologies for rice production that have been tested in the target regions and are suited to wider dissemination and large-scale adoption in Myanmar. By illustrating that these technologies lead to increased farmer incomes, improved value chain efficiency and reduction in income variance, the project will promote their uptake elsewhere in the target regions, in Myanmar, as well as in neighbouring countries. Also, the project will work through 'core' and 'outreach' villages to further increase its reach and develop local capacity and mechanisms for replication beyond the project implementation.

Two parallel strategies can further support the upscaling of adaptation measures promoted by this project. One is the proliferation of private-sector links for farmer groups and SMEs to integrate with markets and industries that support sustainable practices. The other is the integration of such practices and technologies within national development programmes implemented by government and other partners. Additionally, it is important to note that progress has been made in the country with PGS for rice seed production, with potential to expand further and build market access for organic/SRP-certified rice. This has potential for scaling up via the project's resilient value chains (Component 3) facilitated through private and public sector partnerships (particularly the SRP) and the use of ICT tools such as Golden Paddy.

Component 4 will capture the insights that can be shared with government agencies and development partners for potential inclusion in similar projects in Myanmar. Collaboration will be established with the GCF Chindwin River Basin and the RCDP projects. There is also potential for incorporating successful approaches in future FAO regional and global programmes, including, in particular, FAO's Hand in Hand Initiative, for which Myanmar is a priority country in Asia. Additionally, the project's integration with the SRP and similar GEF/LDCF funded projects provides solid platform for scaling

out the innovations and best practices generated by the LDCF to other countries in region. Linkages with other projects in the region under the Sustainable Rice Landscapes Initiative (SRLI) provide potential for exchange, transformation and scaling out across the region.

Capacity development

A capacity needs and awareness survey was conducted during the project design phase and is available as a separate report. The report shows that there is some existing awareness and capacity related to adaptation measures among local government staff and communities. However, this needs to be further developed and linked with adaptation planning and development of institutions and community groups at the local level.

The project incorporates capacity development as a key mechanism for enhancing resilience and adaptive capacity of local communities. Through its Component 1, the project enhances systemic capacity through the development of policies; and institutional and individual capacity through improved cross-sectoral collaboration mechanisms, the capacity building program and the Climate Change Education Center. Under Component 2 also, capacity of local public and private sector stakeholders, institutions and local communities is enhanced through the implementation of targeted local capacity building; by facilitating participatory planning and implementation of adaptation measures; and through the Climate Farmer Field Schools. Importantly also, the capacity to produce and use climate information and agromet services is enhanced throughout Components 1-3 for a wide range of stakeholders including national and local government, private sector, farmers' associations and local communities. Component 3 enhances the capacity of local stakeholders to implement climate-resilient technologies and practices through improved linkages between value chain actors. The project will enhance capacity of local institutions such as farmer associations, water user groups, village mechanization committees through trainings and on-the-ground implementation. Lastly, Component 4 enhances national capacity for monitoring and evaluating adaptation interventions; and builds capacity in institutions for national execution of GEF and similar projects. It also contributes to capacity development through knowledge and information sharing at both national and international levels.

FAO is a recognized world leader in terms of development of the Farmers Field School and been involved in scale out initiatives during the last 3 decades. A wealth of high quality and field-tested capacity building resources have been made available at the FAO website and the Global FFS Platform[127]¹²⁷ subsite in particular. The CFSS farmer education approach to be used as part of project capacity building interventions is a well-recognized and effective approach for human resource development and natural resource management in rural areas in LDCF countries.[128]¹²⁸

8) Summary of changes in alignment with the project design with the original PIF

During the project preparation phase, the project interventions were elaborated in more detail and information was collected on the baseline, co-financing and related initiatives. Some changes were made in close consultation with stakeholders, as described below.

Topic	Main changes from PIF
1) Project title and objective statement	Some inconsistencies between the PIF title/objective statement and the text of the PIF were corrected in consultation with stakeholders. The corrected title is "RiceAdapt: Promoting Climate-Resilient Livelihoods in Rice-Farming Communities <u>in the Ayeyarwady Delta and Bago-Sittaung River Basin</u> ", instead of "Lower Ayeyarwady and Sittaung River Basin". The correct designation of the delta areas is "Ayeyarwady Delta" and "Bago-Sittaung River Basin". The PIF referred to these two delta areas throughout the document, but not explicitly in its title. The objective statement was adjusted accordingly. The spelling of RICE-Adapt was adjusted to RiceAdapt in line with the GEF-5 FishAdapt project.
2) Project duration	The project duration was increased by 6 months, to 5.5 years. As per the work plan in Annex H, the last 6 months are currently only earmarked for project closure. This margin has been included in order to account for any unforeseen delays, in particular due to the new execution modality.
2) Selection of target townships and villages	The project target area was further narrowed down in close consultation with national experts and stakeholders, as described in <i>Section 1.a.1) Global environmental and/or adaptation problems</i> , sub-section <i>Site Selection</i> .

3)
Components,
outcomes
and outputs

Components, outcomes and outputs, as well as indicators, were refined in consultation with stakeholders and based on the detailed baseline analysis conducted during PPG. The main changes are summarized below.

? Component 1 now refers to ?agriculture sector? instead of ?priority sectors? as agriculture is the main focus of the project. Nevertheless, cross-sectoral coordination is still part of the project approach.

? Initial Outputs 1.1, 1.3 and 1.4 on capacity building (including the Climate Change Education Center) have been merged. In turn, an additional Output 2.1 on local capacity building has been added under Component 2, as a foundation for the activities under Component 2.

? Initial Output 1.5 on vulnerability assessments and adaptation planning has been moved to Component 2 (new Output 2.2) and greater emphasis is being placed on participatory assessment and co-design of adaptation measures. As described in *Section 1.a.3) Alternative scenario* of this CEO endorsement request, the planned activities under Components 2 and 3 will be adjusted for each village based on the adaptation measures prioritized by the communities. An aspect on TAPE/agroecology has been added.

? Initial Output 1.6 on ?Financial mechanisms providing incentives for strengthening climate resilience in rice landscapes and value chains? and Output 2.6 ?Credit mechanisms in support of resilient forms of production, recognizing their role in reducing the financial risks posed by climate change? were moved to Component 3 and incorporated into new Output 3.5 ?Contract farming and partnerships established with local/national/global value chain actors to improve access of small-scale producers to markets, credit, technologies, and services?. This was assessed as the most effective and sustainable mechanism for the project to enhance farmers? access to financing. In addition, access to finance is also expected to be targeted by the policy interventions under new Output 1.3.

? Component 2 wording was revised to be more closely aligned with Outcome 2, from ?Promoting nature-based solutions across the landscape for resilient livelihoods? to ?Promoting resilience and adaptation in rice-based farming systems, communities and landscapes?. Accordingly, initial Output 2.1 ?Strengthened mechanisms for promoting innovations in climate resilient practices and nature-based solutions (NBS), including through farmer field schools, improved extension services and SRP standards? was reworded to new Output 2.3 ?Climate farmer field schools, field demonstrations and extension services implemented on innovative climate-resilient/ agroecological practices consistent with quality and sustainability standards such as GAP and SRP?.

? Nature-based solutions in the landscape were included in new Output 2.6 and combined with improved water management: ?Capacities developed in target communities for nature-based solutions (NBS) and improved management of water, through strengthening of community governance and organization?. It was clarified that since the target townships do not have significant mangrove areas, nature-based solutions will cover other interventions such as grassland and wetland conservation and rehabilitation, riverbank stabilization, increase in vegetation cover, etc.

? New Output 2.4 on ?Field implementation support? was also added and explicitly includes landless households.

4) Beneficiary target	<p>The beneficiary target was reduced from 162,000 to 90,000 (50% women) based on feedback from various stakeholders and the GEF-5 Mid-Term Reviews, as well as based on the baseline assessment of target townships and villages. The target townships include villages with very difficult access (roads, some with access only by boat, no or poor access to electricity), which needs to be taken into account for a realistic project design.</p> <p>Regarding the number of people trained, the ratio female-male is adjusted from 54% women to 40% women based on a realistic assessment of the potential training participants. This percentage is still considered ambitious, given that men play a dominant role in farming in the target landscapes. Nevertheless, specific actions to empower women and youth (and the landless) have been incorporated across all components of the project.</p>
5) Co-financing	<p>Co-financing has been adjusted based on a more detailed assessment of the baseline and discussion with partners of collaboration and coordination with existing and planned initiatives. The PIF included USD 40 million in co-financing, composed of the following:</p> <ul style="list-style-type: none"> ? ADB: Resilient Community Development Project (RCDP) (USD 25 million) ? ADB & GAFSP: Climate-Friendly Agribusiness Value Chain Sector Project (USD 15 million) <p>It was discussed that, since there is no geographic overlap with the ADB/GAFSP project (which is implemented in the country's Central Dry Zone), closer linkages can be established with other ongoing initiatives. Thus, the list of co-financing has been revised as follows. However, the ADB projects in Myanmar have been temporarily suspended. Thus, the co-financing letters have not yet been secured.</p> <ul style="list-style-type: none"> ? ADB: Resilient Community Development Project (RCDP) USD 7.5 million ? ADB: Strengthening Climate and Disaster Resilience of Myanmar Communities USD 32.5 million

[1] The Government of the Republic of the Union of Myanmar (2018). Myanmar Sustainable Development Plan (2018 ? 2030).

[2] Khin Lay Swe (2013). Agriculture Contexts of Myanmar under Climate Change. It was observed that cattle feeding systems and manure management in Ayeyarwady Region are different from other regions. Most farmers in Ayeyarwady Region have no manure collection site (cattle shed) near their

houses; generally, the cattle are released to graze in the harvested fields to feed by themselves for several months. The fields are naturally fertilized with animal manures of grazing cattle.

[3] Germanwatch Global Climate Risk Index 2020.

[4] FAOSTAT (2018) <http://www.fao.org/faostat/en/#data/QC/visualize>

[5] Eurocham Myanmar (2020) Agriculture Guide 2020 <https://eurocham-myanmar.org/uploads/47d38-agriculture-guide-2020.pdf>

[6] Kaung Myat (2018) Value Chain Analysis for the Identified Crops in Labutta Township, Ayeyarwady Region, FAO-GCP/MYA/017/GFF

[7] Krishna Prasad Devkota *et al* (2018). Economic and Environmental Indicators of Sustainable Rice Cultivation: A comparison across intensive irrigated rice cropping systems in six Asian countries. In: Ecological Indicators, Vol. 105, pp. 199-214

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See also recent World Bank report (2016) on agricultural pollution in the East Asia region.

<https://openknowledge.worldbank.org/handle/10986/29187>

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[12] Ministry of Planning, Finance and Industry (see RiceAdapt Value Chain and Rural Finance report)

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[13] For an example of locally-relevant rice-fish project experiences:
<https://digitalarchive.worldfishcenter.org/handle/20.500.12348/4168>

[14] MCCA, 2019.

[15] OCHA, Relief and Resettlement Department, UN, USGS, 2016.

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[16] Horton et al. (2017). Assessing Climate Risk in Myanmar: Summary for Policymakers and Planners. New York, NY, USA: Center for Climate Systems Research at Columbia University, WWF-US and WWF-Myanmar, UN-Habitat Myanmar.

[17] Driel and Nauta 2013, Denning et al. 2013, Myanmar CSA Strategy 2015.

[18] <https://sites.google.com/site/bagosittaungriverbasinanalysis/system-discription/b-socio-economical-system/ii-water-users>

[19] The selected RiceAdapt townships in Ayeyarwady Region are located in the mid-Delta area, while the FAO/GEF-5 FishAdapt project is located in the coastal Ah Mar township, the FAO/GEF-5 SLM Project in coastal Labutta township, and the UN Environment GEF-5 project on Community Forestry landscapes in Hinthada township in the upper Delta area.

[20] Source of data: <http://themimu.info/baseline-datasets>

[21] Source: Myanmar Information Management Unit (MIMU) <https://themimu.info/3w-dashboard>

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[25] Source: Township DOA Office, Wakema Township (Sep, 2020).

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[27] Myanmar Living Condition Survey- 2017 (World Bank)

[28] Delta Alliance (2015).

[29] Delta Alliance (2015).

[30] Aye Sandar Phyto et al. (2016). Changing Dynamics in Rural Myanmar: Non-farm Development, Agricultural Labor Shortages and Farm Mechanization.

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[32] See for example: Tun Yat (www.tunyat.com)

[33] Myint Thida (2016). Rural Urban Migration in Ayeyarwady Region: A Case Study of Ah Mar Sub-township, Phyapon District.

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[35] <https://rsis.ramsar.org/ris/2299>

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[37] Myanmar Climate Change Alliance (MCCA, 2018).

[38] World Bank (2013). Turn Down The Heat. Climate Extremes, Regional Impacts, and the Case for Resilience.

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[40] FAO/WFP (2016). Special Report: FAO/WFP Crop and Food Security Assessment Mission to Myanmar. <http://www.fao.org/3/a-i5460e.pdf>

[41] UNDP (2011). Hazard Risk and Vulnerability Assessment Report: Multi Hazard Risk Assessment in Nargis-affected Areas. <https://www.humanitarianlibrary.org/resource/hazard-risk-and-vulnerability-assessment-report-multi-hazars-risk-assessment-nargis-0>

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[43] MCCSAP, 2018.

[44] https://unhabitat.org/sites/default/files/2019/11/labutta-scenarios-for-resilience-building_compressed.pdf

[45] Myanmar Climate Smart Agriculture Strategy (2015).

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https://www.preventionweb.net/files/65014_mccsapfebversion.pdf

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[50] Gallagher et al., 2005. Ecological basis for low-toxicity Integrated Pest Management in Rice and Vegetables. In: J. Pretty (ed) *The Pesticide Detox*. London: Earthscan, pp.116-146 and Way & Heong, 1994. The role of biodiversity in the dynamics and management of insect pests of tropical irrigated rice- A review. In: *Bulletin of Entomological Research*. Vol. 84-4 pp. 567-587

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[53] Myanmar Climate Change Strategy (MCCS, 2018-2030), 2019.

[54] Gulf of Mottama Management Plan (2019).
https://rsis.ramsar.org/RISapp/files/39465170/documents/MM2299_mgt191206.pdf

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[56] With some variations in the embankment and non-embankment areas (in non-embankment areas, farmers are more vulnerable to salinity). SeinnSeinn MU et al. (2015). Farmers' Adaptation to Rainfall Variability and Salinity through Agronomic Practices in Lower Ayeyarwady Delta, Myanmar.

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[58] WHH/Mercy Corps (2020). Delta Rapid Market Assessment Report. Understanding the impacts of COVID-19 on rural smallholder farmers and food systems in the Ayeyarwady Delta. May 2020.

Outgrower schemes are systems that link networks of unorganized smallholder farmers with domestic and international buyers.

<https://www.mercycorps.org/sites/default/files/2020-06/Delta-Rapid-Market-Assessment-COVID-19.pdf>

[59] Adapted from UNEP/HELVETAS Climate Smart Rice Project Interim Third Annual Progress Report, August 2020

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http://themimu.info/sites/themimu.info/files/documents/Report_Vulnerability_Resilience_Assessment_Ayeyarwady_Delta_Feb2015.pdf

[66] <http://documents1.worldbank.org/curated/en/814961593482630234/pdf/Myanmar-National-Food-and-Agriculture-System-Project.pdf>

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[71] Key Informant Interviews during RiceAdapt project design phase

[72] In particular by organizations such as GRET, WHH and IRRI under LIFT-funded programmes.

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[78] http://books.irri.org/MRSDS_content.pdf

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<https://www.myantrade.gov.mm/files/2019/6/5d15977d976568.15955693.pdf>

[80] Myanmar Agriculture Development Strategy and Investment Plan (ADS).

[81] https://unhabitat.org.mm/wp-content/uploads/2019/06/MCCS_ENG_UNH-Website.pdf

[82] https://unhabitat.org.mm/wp-content/uploads/2019/06/MCCMP_ENG_READY-TO-PRINT_27-May-2019.pdf

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[93] <https://www.mmtimes.com/news/myanmar-rice-trading-go-digital-2021.html>

[94] <https://play.google.com/store/apps/details?id=com.nwt.seed&hl=en&gl=US>

[95] <https://www.impactterra.com/golden-paddy>

[96] <https://www.mmgreenovator.com/greenway-app>

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[98] SRP Standard version 2.1, <http://www.sustainable-rice.org/Resources/>.

[99] Soe Paing Oo (2017). Implementation of Good Agricultural Practices of Rice Cultivation in Myanmar: from the view of Agricultural Extension. Soe Paing Oo (2020). Farmers' Perception of Good Agricultural Practices in Rice Production in Myanmar: A Case Study of Myaungmya District, Ayeyarwady Region.

[100] <http://www.fao.org/hand-in-hand/en/> and <https://data.apps.fao.org/>

[101] <https://preferredbynature.org/newsroom/first-1045-farms-now-ready-deliver-srp-verified-sustainable-rice>

[102] Early generation seed (EGS) production: The Department of Agricultural Research (DAR) is the sole producer of breeder seed for the Ayeyarwady region. Foundation seed is produced by four government run seed farms of DAR and the Department of Agriculture (DOA): (i) Myaungmya Research Farm in Myaungmya; (ii) Myanmar Rice Research Centre in Hmawbi; (iii) Tagontaing Seed Farm in Hinthada; and (iv) Thayaung Chaung Seed Farm in Patheingyi. The same DOA and DAR seed farms produce registered seed, and also the Aukywingyi Seed Farm in Pyawbwe is involved in registered seed production. Development organisations such as Radana Ayar and Metta Development Foundation are also supporting registered seed production. (Subedi et al., 2017).

[103] <https://www.lift-fund.org/news/event-news/hundreds-farmers-connect-government-development-and-private-sector-stakeholders>

[104] For instance, World Vision (2012). Value Chain Analysis of Poultry Products in Patheingyi and Myaung Mya Townships; Thi Mar Win et al. (2019). Value Chain Analysis of Duck Products in Bogale and Mawlamyingyun Township; GRET and WHH (2010). Value Chain Analysis of Rice in Bogale and Mawlamyingyun Townships.

[105] Learning Together in the Ayeyarwady Delta: Lessons Learnt from LIFT's Delta Program 2011-2014. <https://www.lift-fund.org/learning-together-ayeyarwady-delta>

[106] Subedi, A. et al. (2017). The Rice Seed Supply and Demand System in the Delta, Myanmar. Study report. Wageningen Centre for Development. https://www.lift-fund.org/sites/lift-fund.org/files/publication/%20LIFT_Seed-Study_Full-Report_Mar2017-low-res.pdf

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[108] Delta RISE study in Bogale and the Mawlamyingyun townships. Off-Farm Business Activities and Livelihoods Analysis in the Ayeyarwady Delta, Myanmar (2019).

[109] WHH/MOALI/MRF (2019). Study Report on Contract Farming on the Rice Seed Sector in the Ayeyarwady Delta.

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[110] WHH/MOALI/MRF (2019). Study Report: Developing Incentive Mechanisms/Public Private Partnership (PPP) Model.

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[111] <https://www.mercycorps.org/sites/default/files/2020-06/Delta-Rapid-Market-Assessment-COVID-19.pdf>

[112] <https://lift-fund.org/news/lift-and-moali-working-cash-work-programme-delta>

[113] <http://www.fao.org/3/i9037en/i9037en.pdf>.

[114] The Agroecology Learning Alliance in South East Asia is supported and coordinated at national and regional level by GRET. Its goal is to enable local and regional agroecology stakeholders to leverage one another's expertise to produce evidence based studies and share them broadly to support a regional transition towards agroecology. <https://ali-sea.org/>

[115] <http://www.fao.org/3/ca7407en/CA7407EN.pdf>

[116] The index proposed for TAPE is the Minimum Dietary Diversity for Women (FAO and FHI 360, 2016). The dietary diversity score consists of a simple count of how many food groups were included in the food consumed over the preceding 24 hours. Because women often prioritize the nutrition of other family members, especially children, and there is evidence showing the association between maternal and child diversity (Nguyen et al., 2013), they can be considered as a proxy for the nutritional status of individuals within the household.

[117] See Section 6.b *Coordination with other relevant GEF-financed projects and other initiatives* for lessons learned of the GEF-5 project.

[118] Such as land use/crop diversification/land tenure/cross-sectoral land use planning, as well as rice-related policies and access to credit.

[119] Note that the RiceAdapt project design is fully aligned with and supports the concepts, principles and good practices outlined in these Voluntary Guidelines.

<http://www.fao.org/news/story/en/item/1373942/icode/>

[120] Recognizing that plant and disease outbreaks, in general, are poorly predicted by just climate-related information alone.

[121] Educating consumers at the Center -and through farm visits- can help raise awareness about CSA and help develop a market for premium quality rice and other farm products produced in a sustainable manner and labelled accordingly (e.g. SRP Verified).

[122] In producer groups, the implementation of the SRP Standard needs to be managed by an IMS. An effective IMS needs to be in place as per SRP Assurance Scheme published rules and regulations and be aligned with IMS Standard requirements and compliance levels.

[123] Including vacuum/hermetically sealed bags such as those introduced by IRRI.

<http://www.knowledgebank.irri.org/step-by-step-production/postharvest/storage>

[124] WHH/Mercy Corps (2020).

[125] Lower Sittaung Key Biodiversity Areas: Gulf of Mottama, Moeyungyi Wildlife Sanctuary, Kelatha, Kyaikhtyoe; Lower Ayeyarwady KBAs: Ayeyarwady Delta, Yelegale, Maletto Inn, Hlawga Reservoir.

Note: At COP-11 of the Ramsar Convention in Bucharest (2012) a Resolution (XI.15) on Rice Paddy and Pest Control was adopted specifically calling for the judicious use of pesticides in rice production.

<https://www.ramsar.org/sites/default/files/documents/pdf/cop11/res/cop11-res15-e.pdf>

[126] According to the Global Climate Risk Index 2020 in: Eckstein, Kunzel and Schafer 2019.

https://germanwatch.org/sites/germanwatch.org/files/20-2-01e%20Global%20Climate%20Risk%20Index%202020_14.pdf

[127] <http://www.fao.org/farmer-field-schools/en/>

[128] Selected references: Swanson & Rajalathi, 2010. *Strengthening Agricultural Extension and Advisory Systems: Procedures for assessing, transforming and evaluating extension systems.*

Agriculture and Rural Development Discussion Paper #45, Washington DC: IBRC & WB. And also:

Pretty et al, 2020. *Assessment of Growth in Social Groups for Sustainable Agriculture and Land Management.* Published online by Cambridge University Press:

<https://www.cambridge.org/core/journals/global-sustainability/article/assessment-of-the-growth-in-social-groups-for-sustainable-agriculture-and-land-management/2D5DBD740176F6D4E49C6F2D678F7FA3>

1b. Project Map and Coordinates

Please provide geo-referenced information and map where the project interventions will take place.

Region	District	Township	Geo-coordinates
Ayeyarwady	Pyapon	Kyaiklat	16.43,95.73
	Maubin	Maubin	16.73,95.65
	Myaungmya	Wakema	16.6,95.18
Bago	Bago	Kawa	17.09,96.46
	Bago	Thanatpin	17.21,96.3
	Bago	Waw	17.47,96.68

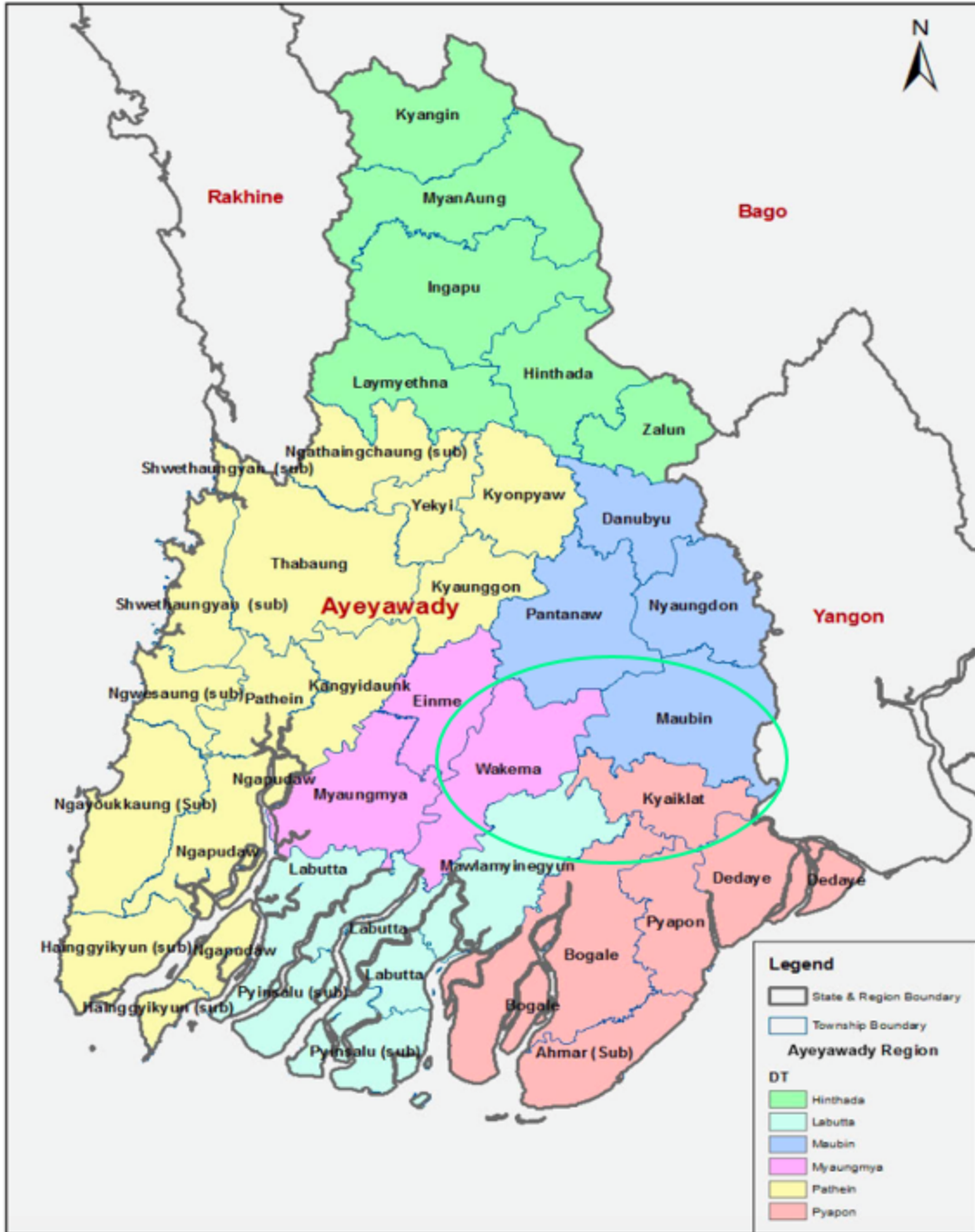


Figure 22: Map of Ayeyarwady Region, showing the three target townships of Kyaiklat, Maubin and Wakema



Figure 23: Map of Bago Region, showing the three target townships of Kawa, Thanatpin and Waw

1c. Child Project?

If this is a child project under a program, describe how the components contribute to the overall program impact.

2. Stakeholders

Select the stakeholders that have participated in consultations during the project identification phase:

Civil Society Organizations Yes

Indigenous Peoples and Local Communities Yes

Private Sector Entities Yes

If none of the above, please explain why:

Please provide the Stakeholder Engagement Plan or equivalent assessment.

Please refer to the Stakeholder Engagement Plan in [Annex I2](#) uploaded below.

In addition, provide a summary on how stakeholders will be consulted in project execution, the means and timing of engagement, how information will be disseminated, and an explanation of any resource requirements throughout the project/program cycle to ensure proper and meaningful stakeholder engagement

The Stakeholder Engagement Matrix in [Annex I2 \(uploaded in the document section\)](#) includes information on how stakeholders have been consulted, and how they will be engaged in the project execution, including any disadvantaged or vulnerable groups/individuals and ethnic minorities. As explained in Annex I2, civil society such as members from academia and local associations, NGOs and women's groups will be involved as partners, beneficiaries and technical experts throughout project implementation.

Consultations have been conducted with relevant central-level government ministries, township DOA officers, village administrators, research institutions, civil society organizations, and private sector entities, and their inputs have informed the design of the LDCF project. The main stakeholders engaged include the Ministry of Natural Resources and Environmental Conservation (MONREC), Environmental Conservation Department (ECD) & Ministry of Agriculture, Livestock and Irrigation (MOALI), Department of Agriculture. Other departments of these two ministries that have been consulted include the Forest Department of MONREC, the Department of Planning (DOP), Department of Agricultural Research (DAR), Department of Rural Development (DRD), Agricultural Mechanization Department, Department of Livestock Breeding and Veterinary Department (LBVD) and Irrigation and Water Utilization Management Department (IWUMD) in MOALI. Furthermore, the Department of Meteorology and Hydrology (DMH) under the Ministry of Transport and Communication has also been consulted on the project design. In addition, the project has undertaken in-depth consultations with the General Administration Department (GAD) and other related stakeholders at Township level and Village Administrator at village level, to inform them and

receive their feedback on the proposed outcomes, target groups and interventions of the project. Project beneficiaries from local communities, including women, landless and ethnic minority groups have also been consulted during project design and their inputs incorporated, as described in Annex I2.

Consultations with other relevant stakeholders include the International Rice Research Institute (IRRI), GRET (Group de Recherche et d'changements Technologiques), Pact Global Microfinance Fund (PGMF), Welthungerhilfe (WHH), Myanmar Rice Federation (MRF), Helvetas, Wildlife Conservation Society (WCS), Helen Keller International, Proximity Designs, Mercy Corps, the Sustainable Rice Platform (SRP), the International Water Management Institute (IWMI), the International Union for Conservation of Nature (IUCN), BANCA Biodiversity Centre, Fauna and Flora International (FFI), Network Activities Group (NAG), SDC, NORAD, and GIZ. Some of these organizations, including GRET, Welthungerhilfe, PGMF and other NGOs have been working in the Delta for more than a decade in the field of agriculture development and farmer organization with LIFT and other funding, and have relevant experience and lessons learned that have influenced the RiceAdapt project design. Private sector stakeholders, including millers, input providers, MAPCO, MRF and Awba were consulted during the project preparation.

Local CSOs/NGOs and Research and Development (R&D) partners are expected to be engaged throughout the project through Letter of Agreements (LOAs). Community groups such as village committees, mechanization committees, Water User Groups and farmer cooperatives will also be key beneficiaries under Components 2 and 3 of the project. Moreover, the project will involve ethnic minorities as the areas targeted by the project comprise of at least seven ethnic groups, with Bamar and Kayin being the majority. The majority of the people in targeted areas are Buddhist, with small minorities of Christians, Muslims and Hindu. A Free, Prior and Informed Consent (FPIC) process has been initiated during PPG and will be continued during implementation, as per the project's FPIC plan (Annex J). The defined FPIC process ensures that all ethnic groups within the project sites are consulted, participate in and equally benefit from the project interventions. The project also utilizes Conflict Sensitive Principles in its design and implementation, following guidance by LIFT's Conflict-Sensitive Programming (see *Section 5. Risks*).

The project will ensure meaningful engagement of key stakeholders from government, civil society such as NGOs, academia, R&D partners, private sector associations, local communities and farmer cooperatives throughout project implementation. The Project Management Unit (PMU) will be responsible for implementing the stakeholder engagement as outlined in the Stakeholder Engagement Matrix. Budget for stakeholder engagement has been allocated through the meeting, training and travel budget lines in Annex A2. Relevant activities have been included in the work plan (Annex H). The PMU will also be responsible for monitoring and reporting on stakeholder engagement through the annual project implementation reports (PIRs).

In the annual PIRs, the PMU will report on the following indicators:

- 1) Number of government agencies, civil society organizations, private sector, vulnerable groups and other stakeholder groups that have been involved in the project implementation phase.

- 2) Number of engagements (such as meetings, workshops, official communications) with stakeholders during the project implementation phase.
- 3) Number of grievances received and responded to/resolved.

Select what role civil society will play in the project:

Consulted only;

Member of Advisory Body; Contractor;

Co-financier;

Member of project steering committee or equivalent decision-making body; Yes

Executor or co-executor; Yes

Other (Please explain)

3. Gender Equality and Women's Empowerment

Provide the gender analysis or equivalent socio-economic assesment.

The project is guided by the GEF's and FAO's Policy on Gender Equality and the GEF Gender Implementation Strategy, as well as by the principles of National Strategic Plan for the Advancement of Women (2013-2022)[1]. Building upon the gender considerations laid out in the MCCSAP, a gender analysis and assessment was undertaken during the PPG phase to provide the basis for understanding gender roles and relations, identify existing structural and socio-cultural constraints as well as opportunities for meaningful participation and empowerment of women. To ensure that they get equal and priority access to project services and benefits, the LDCF project incorporates measures to increase women's participation and influence in (among others) community-based participatory planning, and a minimum level of approved activities must be a priority for women. The extent to which women in project areas are affected by climate-related events and by consequent impacts on agricultural production was analysed during project preparation and has informed the project design.

Gender analysis

The gender analysis finds that many parts of Myanmar's society still believe that low value work belongs to the responsibility of women rather than men. Even in the case of women's engagement in paid works, men are not supposed to help in the household works. Wage disparities exist between men and women hired labors. With regard to access to land and resources, women in Myanmar can technically register their names on land use certificates. However, women have a range of social,

cultural and practical barriers that apply. Due to the custom that land and other valuable assets are registered under the men's names, women entrepreneurs face difficulty in financing their businesses since they must often depend on male family members for the provision of collateral to obtain a loan or are unable to use their property or run their businesses on their own terms.[2] A recent study on mobile phones and internet use revealed that the rate of women who own a mobile phone in Myanmar is 29 percentage points lower than that of men. Poor women have an even lower rate of mobile phone ownership.

Women's decision making at community meetings and social gathering is limited. Although there are spaces provided in the community activities for women to be able to learn and gain new knowledge by communicating and interacting with others, women attendance is low especially in rural areas of Myanmar. With regard to education and literacy levels, men have slightly higher education and literacy than women in the target townships.

Several gender studies have been carried out over the past few years by donor-funded projects in the target regions and recommendations have been formulated. A gender assessment conducted by the USAID Fertilizer Sector Improvement project (2015) concluded that women are often less likely to adopt mechanized tools if they are not explicitly targeted and introduced to them. Among others, the study recommends considering engaging women as fertilizer service providers/fertilizer distributors.[3] Another study on the 'impacts of rural changes on women labor involvement in crop production of Myanmar' recommended that the situation of women landless labour should be taken into account in designing and implementation of agricultural development programs.[4]

Gender roles in agriculture. In the surveyed areas within Bago and Ayeyarwady regions, men lead the agricultural activities by managing labour and machinery use in the farms. Women support the male household heads in some activities such as planting, seeding and harvesting, as well as cooking and sending the food to the farms during cultivation time. In female-headed households, women hire labour and machines especially if there is no family member to do the agricultural activities. In such households, women manage all farm activities with their own decisions from farm planning to marketing. The same holds true for households in which male household heads migrate to other areas to earn income.

Table 4: Agricultural tasks by sex in the surveyed areas of Bago and Ayeyarwady regions

Men	Women
Crop-Paddy	
Plowing	Planting of the transplanted paddy seedlings in the farm

Seedbed preparation & growing of the seedlings	
Taking out of the rice seedlings to transfer from seedbed to paddy farm	Planting of the seedlings in the missing hills
Herbicide Spraying	Weeding in the transplanted paddy farms
	Harvesting of the paddy plants by hand
Carrying of the harvested paddy	Carrying of the harvested paddy
Drying of threshed paddy	Drying of threshed paddy
Fertilizer Application	Procurement of the hired labors
Crop-Legume Crops	
Fertilizer Application	Procurement of the hired labors
Pesticide Spraying	Pesticide Spraying (Rare) & Carrying/ Fetching of the water from the bores for mixing of pesticides with water
Picking/ Harvesting of the pods	Picking/ Harvesting of the pods
Threshing of the pods	Threshing of the pods
Marketing	
Decision making in selecting the crops to plant, and to sell the crops at which price (joint decision with women)	Decision making in selecting the crops to plant, and to sell the crops at which price (joint decision with men)
Communication to the brokers and traders	Communication to the brokers and traders

Source: Virtual Data Collection in November 2020

Gender-differentiated impacts of climate change. Like in other countries, in Myanmar women are impacted differently by climate change than men, and are often among the most vulnerable to climate change impacts. A study of the post disaster situation of the 2008 Cyclone Nargis in Myanmar found that 60% of female-headed households lived in unsatisfactory shelters and that female-headed households made up the highest percentage of the low income groups. Additionally, men are generally more mobile and more likely to migrate to areas unaffected by climate events in search of employment, whereas women are more likely to stay back in the affected area to care for the family and

household.[5] Due to patriarchal norms, customs and institutions, women are often excluded from participating in decision-making and community processes.

A study on the Impacts of Rural Changes on Women Labor Involvement in Agriculture of Myanmar (2017) showed that the total number of working days in agriculture has been decreasing because of the utilization of farm machines (combine harvesters) and changes to agronomic practices (from transplanting to broadcasting, using herbicides). As a consequence, job opportunities in the farm sector are decreasing for both men and women. As many off-farm jobs require people to migrate, women are constrained in their ability to take up these opportunities compared to men.[6]

Gender strategy and action plan

Based on the analysis above and in consultation with stakeholders, a gender strategy and action plan was prepared for the RiceAdapt project. The strategy aims to address the following key barriers to gender equality and women's empowerment.

1. *To address the lack of awareness and recognition of women's role and contribution to agricultural livelihoods:* The Project Management Office (PMO) will appoint a National Safeguards and Gender Specialist to act as the gender focal point and to work closely with the representatives from MOALI and MONREC, SMEs, millers, agricultural cooperatives and farmers associations and service providers for providing the gender sensitization trainings to multiple stakeholders and project staffs and to conduct awareness raising on women's role in society and their contribution to rice-based livelihoods.
2. *To ensure participation of women in decision-making:* The project will encourage the participation of women in decision-making committees at national, region and local levels. Furthermore, the project will ensure that women are able to actively participate in the consultations and decision-makings related to project interventions, through adequate mechanisms such as timing and modality of meetings. In this way, the project will make sure that priorities and needs of women are taken into account in planning and implementation.
3. *To enhance economic and entrepreneurship opportunities for women, in particular with regard to access to technologies and finance:* The project will implement several outputs aimed at promoting economic opportunities for women, including entrepreneurship and skills enhancement for both women and youth. It will also ensure that women equally benefit from the project interventions and related socio-economic benefits. Women farmers will be supported to implement climate resilient/ agro ecological practices, including methods such as rice-fish/ rice-duck farming and livestock raising/ home gardening for the landless. Moreover, women will be engaged to participate in the contract farming opportunities, as well as access to credit. Finally, with regard to technologies, the project will support women-friendly agricultural tools and farm machineries (such as lightweight threshers).
4. *To increase the availability of gender-disaggregated data and gender-responsive policies/ indicators/targets:* The project will promote the collection, management and use of sex- and age-disaggregated data and indicators, in particular through the M&E systems developed by the project.
5. *To ensure participation of women in capacity building:* The project will not only promote women's involvement in project planning and implementing the activities, but also women's empowerment through capacity building.

These strategies are eventually aimed at achieving the following outcomes:

- 1) Closing gender gaps in access to and control over natural resources (through increased participation in decision making as well as economic empowerment).
- 2) Improving women's participation and decision making.
- 3) Generating socio-economic benefits or services for women.

Please refer to the Gender Analysis and Action Plan in **Annex O** (uploaded below) for more details.

[1] https://myanmar.unfpa.org/sites/default/files/pub-pdf/NSPAW2013-2022_0.pdf

[2] UNIDO (2015). Access to finance for youth and women entrepreneurs in Myanmar.

[3] <https://culturalpractice.com/wp-content/uploads/2-fsi-burma-gender-assessment-1.pdf>

[4] Soe Soe Htway et al. (2017). Impacts of rural changes on women labor involvement in crop production of Myanmar.

https://www.researchgate.net/publication/321759017_Impacts_of_rural_changes_on_women_labor_involvement_in_crop_production_of_Myanmar

[5] Women's Protection Technical Working Group (WPTWG 2009)

<https://reliefweb.int/sites/reliefweb.int/files/resources/capriwp106.pdf>

[6] Soe Soe Htway et al. (2017).

Does the project expect to include any gender-responsive measures to address gender gaps or promote gender equality and women empowerment?

Yes

Closing gender gaps in access to and control over natural resources; Yes

Improving women's participation and decision making

Generating socio-economic benefits or services or women Yes

Does the project's results framework or logical framework include gender-sensitive indicators?

Yes

4. Private sector engagement

Elaborate on the private sector's engagement in the project, if any.

An analysis of the key actors of the rice value chain in the target areas was conducted as part of the RiceAdapt baseline studies. A summary is shown in Figure 24 below. Similar value chain analyses have been conducted for other crops/commodities in the target regions, such as for pulses, chili and duck (please refer to *Section 2) Baseline scenario* and *Section 6.b Coordination with other relevant GEF-financed projects and other initiatives*).

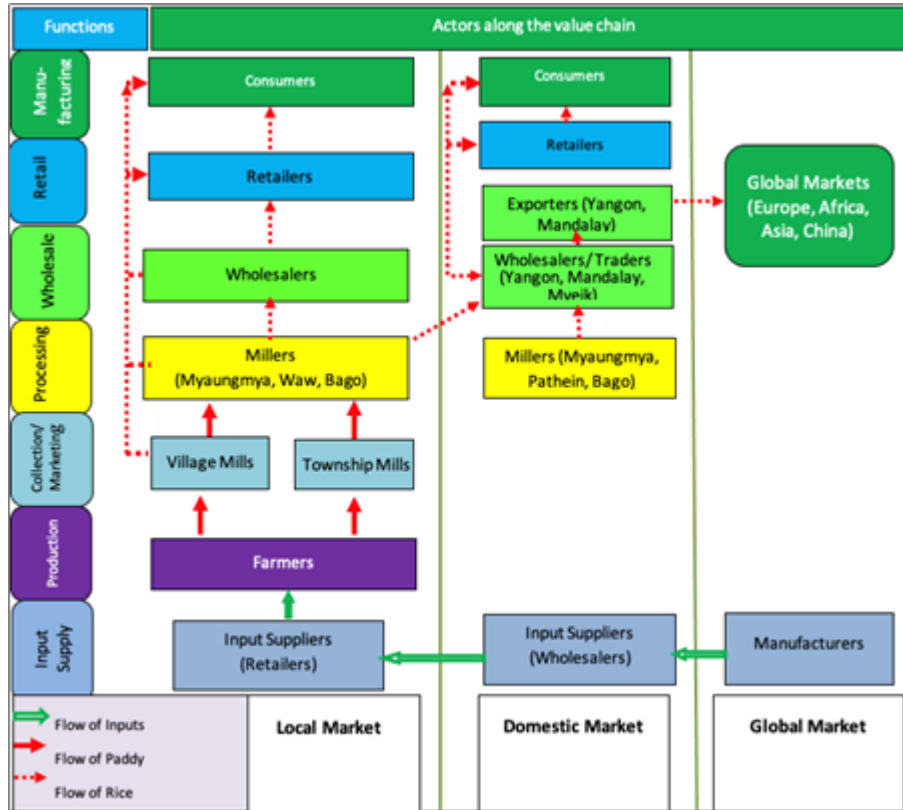


Figure 24: Key actors in the rice value chain

The following farmer support services are provided by these key actors in the target townships. In addition, financial service providers such as MADB are also important actors.

#	Support Services	Rice Millers	Seed Producers	Farm Machinery Service Providers	Agricultural Input Retailers
1	Seed production		?		
2	Land management			?	

3	Repair of machines, consultation			?	
4	Credit, loans	?			?
5	Market information	?	?		?

With regard to the rice seed value chain, the following key actors have been identified:[1]

1. Department of Agricultural Research (DAR)
2. Department of Agriculture (DOA) Seed Farms
3. Private sector actors such MRF, MAPCO, and private seed companies
4. Supporting organizations (Myanmar Agricultural Development Bank, NGOs, etc.)
5. Seed grower associations at township and regional level

In recent years Myanmar has seen a steep growth in use of mechanization in rice production. The private sector can play a key role in this envisioned transformation towards more mechanized rice farming. For example, the Tun Yat local start-up provides harvester and tractor machine hiring options, with booking services facilitated through its smartphone-based application.[2]

Strengthening the adaptive capacities of local private sector, including farmers, farmer groups and cooperatives, and SMEs (MSMEs) through climate resilient rice value chains and agribusiness development is the essence of the project. The baseline studies conducted during the RiceAdapt project design have shown that farmer organization in the target townships is very limited. There is no collective purchasing and marketing system and most farmers sell their paddy directly to rice millers, primary collectors/brokers and commodity sale centers in townships. Consequently, under Component 3, the project will focus on introducing/strengthening farmer groups, producer organizations and private sector entities engaging in rice and other agricultural value chains. This will include producer and miller associations and national companies (such as Awba, MAPCO, Myanmar Agricultural Development Bank, Myanmar Rice Federation, Myanmar Farmer Association and Myanmar Farm Crop Producers Association). It will also include global corporations including companies that buy rice and are members of the World Business Council for Sustainable Development (WBCSD) and other members of the SRP.

As a first step, the project will establish a value chain network, that brings together various actors along the rice value chain (and potentially other crops), building on platforms and partnerships established under earlier projects, to support climate-resilient rice value chains such as through the use of the SRP Standard and the associated Assurance Scheme. Targeted capacity building, including with support from private sector actors, will then be provided for agricultural cooperatives, SMEs and farmer organizations/groups in identified priority areas. In particular, the project will strengthen women and youth entrepreneurship. Climate-resilient grain storage facilities and processing technologies will be

introduced in the target communities for value addition and to reduce losses at various stages of the rice value chain. Finally, contract farming and partnerships will be established between smallholder farmers and local/national/global value chain actors to improve access of small-scale producers to markets, credit, technologies, certified seeds and services.

The project will also collaborate with Golden Sunland, a Singapore-based company promoting responsible farming business from seed to harvest. Golden Sunland, a member of the Sustainable Rice Platform (SRP) and interested in sourcing *SRP Verified* rice from farmers in Myanmar, is already working in Labutta Township of the Delta producing hybrid rice seeds with buy back agreements and exporting to Singapore. They collaborate with smallholder farmers at the ground level in all aspects of farming in order to bring higher crop yield while reducing farm inputs to achieve sustainability and lower the overall carbon footprint. The RiceAdapt project aims to expand this collaboration to other townships in the target area. In addition to hybrid rice, Golden Sunland also conducts research and development with DAR on local varieties. This is important for the RiceAdapt project in terms of promoting resilience and sustainability, as a too widespread focus on hybrid rice may lead to a narrow genetic base risking pest and disease outbreaks and dependence of farmers on inputs (seeds, agrochemicals) from the private sector.

The project will work with Miller Associations at township or regional level, building on the achievements of baseline projects including LIFT-funded RSSD project in Ayeyarwady and the Climate Smart Rice Project in Bago. It will collaborate with rice seed contract farming companies such as Kyeik Latt Seed Production Enterprises, a partner under RSSD. Private sector actors along the value chain will be encouraged to invest in climate-resilient practices and adaptation technologies through sharing of good practices and through the enhanced policy environment under Component 1. These technologies also include upgrading post-harvest management practices that improve quality of rice seed, such as by using gravity separator, grader, seed cleaner aiming at higher purity grade for rice seed producers, and paddy driers to get quality grain for farmers.

Social enterprises, such as women and youth enterprises strengthened under Output 3.3, will improve farmers' and value chain actors' access to information on productivity, markets and financing opportunities for climate-resilient SMEs and agribusinesses. Furthermore, it is expected that private finance institutions will provide accessible finance to farmers for climate-resilient rice and agriculture. The project will also benefit from recent developments of innovative agri-mobile apps such as Greenovator, Green Way app and Awba's Htwet Toe app as well as the recently released B2B app (Myanmar Rice Portal) for the rice seed production sector developed with LIFT-RSSD/MRF support. These apps help farmers achieve higher yields, including through better access to quality seeds, and provide farm advisory and mechanization services and soil testing.

Finally, the project may also engage with the Myanmar Fruit Flower and Vegetable Producers and Exporters Association (MFVP) to promote PGS and organic fruit and vegetable production as part of its diversification strategy. There are some vegetables (e.g. tomato, cabbage, cauliflower) which are

highly demanded in the lower/southern part of Ayeyarwady Delta Region, but not currently grown by rice farmers. The local market especially in the southern part of Ayeyarwady region cannot meet the demand primarily and most vegetables have to be imported from Yangon and Hinthada district. Therefore, the project might consider facilitating for farmers to cultivate more vegetable and harvest crops in demand to decrease imports from outside Ayeyarwady Delta and bolster the local agriculture sector.[3]

[1] WHH/MOALI/MRF (2019). Study Report: Developing Incentive Mechanisms/Public Private Partnership (PPP) Model.

[2] www.tunyat.com

[3] Vegetable Sector Acceleration Task Force. Myanmar vegetable farmers are in business, Draft white paper 2016.

<https://www.dutchvegsupportmyanmar.com/wp-content/uploads/2018/01/White-paper-VSAT-31-March-2016.pdf>

5. Risks to Achieving Project Objectives

Elaborate on indicated risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and, if possible, the proposed measures that address these risks at the time of project implementation.(table format acceptable):

Description of risk	Impact [1]	Probability of occurrence	Mitigation actions	Responsible party
<i>Capacity / participation risks</i>				

<p>1) <i>Private sector involvement will be low due to low perceived benefits from their participation.</i></p> <p>Private sector in Myanmar is still under development ? particularly in more remote rural areas. Therefore, the emerging private sector (such as millers) may not be aware of opportunities of their engagement and mutual benefits for them and local communities through their engagement in project supported activities.</p>	M	M-H	<p>The project builds on important recent achievements and progress made in private sector engagement, in particular in the targeted project regions. Lessons learned from LIFT-funded projects in Ayeyarwady Delta, and from the Climate Smart Rice Project in Bago, have been taken into account in the project design. The project also builds on recently issued guidelines and standard operating procedures for contract farming, and on the growing awareness among government officials of the need for involving private sector in issues such as agricultural mechanization and provision of extension services.</p> <p>The project will ensure strong communication with and involvement of the private sector in all its components, and particularly through the value chain network to be established under Output 3.1.</p>	PMU
<p>2) <i>Market demand for premium quality rice (e.g. SRP Verified) will not materialize as anticipated.</i></p> <p>Several international buyers have expressed interest in contract farming agreements and in purchasing SRP Verified rice. Nevertheless, there is a risk that this demand may not materialize, for economic, market or political reasons.</p>	M	M-H	<p>The project will continue to leverage partnerships under the Sustainable Rice Landscapes Initiative and the Sustainable Rice Platform, through FAO and its partners. Additionally, it will emphasize benefits of SRP that go beyond premium price, such as increased yields, lower input costs, health benefits, etc. These are important incentives for farmers in addition to the market incentives.</p>	PMU

<p>3) <i>Lead executing agencies MOALI and MONREC have limited experience in executing GEF projects and moderate fiduciary capacity, which may slow the project implementation.</i></p> <p>MOALI and MONREC do not have experience in executing GEF and similar projects. Project implementation may be delayed due to long budget approval processes.</p>	M	M-H	<p>A fiduciary capacity assessment was initiated during PPG. However, due to the political situation in the country it has not yet been completed. Thus, the implementation arrangements are yet to be finalized once the activities can be resumed.</p> <p>Moreover, international NGOs experienced in the implementation of international donor-funded projects will be engaged in the execution of the project through LOAs.</p> <p>The project also benefits from similar ongoing experiences by the GCF Chindwin River Basin project.</p>	PMU
<p>4) <i>High turnover of MOALI and MONREC staff at the local level, such as extension service officers, limits the benefits of the project and its potential for replication.</i></p> <p>High turnover and rotation of government staff reduces the impacts of capacity building efforts of the project.</p>	M	M-H	<p>From the onset, the project will work through farmer support systems that not only include public extension services, but also private extension workers and farmer organizations, as well as lead farmers at the local level. ICT tools will also be strengthened, and the project benefits from recent advances in the e-Extension system promoted by the KOICA project.</p> <p>Awareness will also be raised among MOALI of the need for a long-term vision in the provision of extension services, including through the development of human resources.</p>	PMU

<p>5) <i>Insecure land tenure reduces incentives for farmers to participate in project activities or to sustain them in the long term, affecting project outcomes.</i></p> <p>A significant proportion of farmers in the project area are landless or do not have secure land tenure. These farmers are often the most vulnerable, and this may undermine their capacity and willingness to participate in the project activities or sustain them in the long term.</p>	M	M	<p>A socio-economic analysis (including land tenure analysis) was conducted during PPG. Among others, the project will strengthen access to diversified livelihood opportunities (livestock raising, gardening, rice-fish, rice-duck) for landless and women-headed households. During the consultations, it was emphasized that procedures to request to convert paddy land to other business purpose are complicated and land use decisions are still centralized. Thus, under Component 1, the project will also aim to improve the policy environment related to land use decisions and cross-sectoral land use planning.</p> <p>Where relevant, the project will address land tenure issues both at the local as well as policy levels.</p>	PMU
<p>6) <i>The effectiveness of the project's work with resilient value chains might be affected in the event of changes in national export policies.</i></p> <p>Changes in export policies might, potentially, negatively affect the project outcomes, including through export bans such as those implemented at the beginning of the COVID-19 lockdown.</p>	L	M	<p>Through its continued engagement in policy issues, it is anticipated that the project will be able to influence any changes in export policies. Also, the current government policies, including the COVID-19 Economic Relief Plan, are well aligned with the project goal. This risk is, thus, considered low, but will be monitored.</p>	PMU
<i>Socio-economic / political risks</i>				

<p>7) <i>Required multi-sectoral support to enhance community resilience is not available as the project is seen as primarily an agriculture related project.</i></p> <p>Though the project focuses on rice landscapes, the project may be perceived as a rice related project and not about strengthening climate resilience, thereby reducing the interest from other sectors in supporting a holistic approach to climate resilience of local communities.</p>	M	M	<p>The project will work directly with different sectors to build their knowledge and capacities so that this issue is addressed from national to local levels. The collaboration between MOALI and MONREC as joint executing agencies of the project further strengthens this link. Furthermore, rice and agriculture more generally have been highlighted as key areas for strengthening resilience in various national plans and policies, including the COVID-19 Economic Relief Plan. The roles of local governments will be particularly emphasized to ensure different stakeholders are brought together to support local communities.</p>	PMU
<p>8) <i>Strong local economic forces lead to significant land use changes in project sites from rice to non-rice or significant changes in local livelihoods.</i></p> <p>Increasing urbanization and other development could incentivize farmers to transform their rice fields into non-rice or for farmers to move out of farming to other non-farm livelihoods (including migration). That could mean that in some proposed areas, at localized places, project actions to target most vulnerable rice farming households may become irrelevant.</p> <p>Furthermore, one of the major issues in rural areas of the delta is migration of youth (in particular, young men) towards urban centres resulting in shortage of labour available (and increase in labour costs). This prevents wide adoption of rice intensification and agroecological practices relying on high labour use such as SRI.</p>	H	L	<p>The project has selected sites that are relatively less touched by urbanization, are in more remote areas and less at risk of development. Moreover, diversification away from a farming system solely based on rice cultivation into more resilient rice-based farming systems is one of the strategies promoted by the project (taking into account the specific local conditions of the project area).</p> <p>The project has incorporated considerations of the prevailing high labour costs into the project design. Labour costs will be taken into account when selecting adaptation options, including agroecological practices and nature-based solutions. Moreover, it is expected that by providing enhanced opportunities for youth entrepreneurship and by linking farmers with value chain actors, the project will contribute (although in a modest way) to increasing incentives for youth to pursue agricultural livelihoods. Also, by improving mechanization, the project will enhance opportunities for women farmers to participate in agriculture.</p> <p>The project will monitor any land use and demographic changes that may affect the project outcomes, and will periodically review its intervention strategy.</p>	PMU

<p>9) <i>Political risks such as change in government and conflicts in the project regions may affect stability in the project area.</i></p> <p>Myanmar has a history of political instability, with almost one-third of the country being conflict-affected. Further instability is expected to arise based on the current political crisis.</p>	M	H	<p>Political risks will need to be addressed and the project's strategy may need to be adjusted to reflect the changing situation.</p> <p>The project is targeting areas that are not directly affected by active conflicts. Furthermore, the project will ensure a transparent and responsive approach to mitigate any potential conflicts. In this regard, the project will apply Conflict Sensitive Principles in its design and implementation, guided by LIFT's Conflict-Sensitive Programming.[2]</p> <p>The project also builds on the experience of the Resilient Community Development Project (RCDP). The RCDP adopts a conflict-sensitive approach that promotes a good understanding of the local context, builds in flexibility in design and implementation, and establishes strong local ownership. Where relevant, project materials and manuals will be translated into local languages, in addition to Burmese.[3] These principles will also be applied in the RiceAdapt project.</p>	PMU
<i>Environmental / climate risks</i>				

<p>10) <i>Significant climate disaster events (storms and/or flood; droughts) and other natural disasters may greatly undermine attempts to increase community vulnerability.</i></p> <p>Increasing community resilience to climate variability and change is a longer-term process. Project investments in increasing household and community resilience may be severely undermined by greater than anticipated climate and non-climate related disasters.</p>	H	M-H	<p>A climate risk screening and climate risk assessment was conducted during PPG and has been uploaded to the Documents section of the Portal. Its recommendations have been incorporated into the project design. The climate risk for the project area is rated as high. However, while the hazards, exposure and vulnerability of the project area make the climate risks high, the project integrates measures to mitigate those risks. A summary of the analysis can be found in <i>Section 1.a.1) Global environmental and/or adaptation problems</i>. The project is specifically designed to address climate risks and build resilience in the face of present and future changes. In particular, the project will (i) increase the availability of information on climate change and (ii) as necessary, help introduce more resilient technologies, and ensure that strong partnerships are developed with disaster mitigation authorities and other partners.</p> <p>Nevertheless, specific climate or non-climate related disasters may have a significant impact on project outcomes during project implementation. By climate-proofing relevant investments such as storage facilities, post-harvest technologies or diversification options, the project aims to mitigate this risk. In case of major climate hazards such as floods and storms, the project will have the ability to adjust its intervention strategy through its adaptive management approach.</p> <p>Additionally, the project will ensure that its interventions are durable and robust in the face of uncertain rates of change. Interventions will be based on ?no regrets? options, i.e. options that will be beneficial irrespective of the climate scenario. An important focus of the project will be on developing capacities among stakeholders and institutions for adaptive planning and management, and for continuous and incremental learning.</p>	PMU
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Risks related to COVID-19

<p>11) <i>COVID-19 continues to affect farmers and market actors? ability to implement effective agricultural value chains.</i></p> <p>As mentioned in the baseline section, surveys conducted by FAO and other stakeholders during the COVID-19 pandemic have shown that COVID-19 related restrictions have significantly affected all aspects of food production, including agricultural trade and market systems, produce prices, and the quality and price of agricultural inputs.</p>	<p>H</p>	<p>M-H</p>	<p>The project will continue efforts of government and NGOs to support farmers and communities to address COVID-19 related issues in the short term, and to build resilience into their farming systems and value chains for the long term. COVID-19 considerations will be fully integrated into the project's participatory vulnerability assessments and resilience building activities.</p>	<p>PMU</p>
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<p>12) <i>COVID-19 restrictions lead to significant delays in project start-up and implementation, and reduced capability of the project to engage with local stakeholders.</i></p> <p>COVID-19 may restrict the project's ability to be present in project sites and engage local stakeholders. Impacts from COVID-19 may also affect the availability of technical expertise and capacity.</p> <p>Furthermore, COVID-19 or similar future crises may lead to changing policy environment and may affect the availability of co-financing.</p>	M	M	<p>The project will work closely with local stakeholders, including NGOs that are present in the project sites, local government and DOA township officers, to address this risk. Due to the continued presence of internationally funded projects and a large number of national experts, the availability of technical expertise is not anticipated to be affected significantly.</p> <p>COVID-19 awareness raising and prevention activities will be an integral part of the project activities at the local level (including through messaging, distribution of face masks, hand sanitizer, social distancing in meetings, etc.). Approaches tested under FAO's GEF-5 projects, such as the Peer-to-Peer Learning Platform developed under the FishAdapt project (including training of facilitators), will be replicated where relevant. Finally, with regard to Farmer Field School implementation, the project will follow the guidance of the recent handbook <i>Running farmer field schools in times of COVID-19</i>, developed by FAO (2020).[4]</p> <p>With regard to the policy environment, as mentioned above, rice and agriculture more generally are highlighted as key areas for strengthening resilience in various national plans and policies, including in the COVID-19 Economic Relief Plan, and it is not anticipated that this would change significantly in case of continued or similar future crises. Similarly, co-financing is not expected to be affected due to the additional investments in COVID-19 response. In turn, there is an opportunity for the RiceAdapt project to directly contribute to the COVID-19 Economic Relief Plan through its investments in capacity and resilience building.</p> <p>The project will continue to monitor the situation and implement adequate mitigation measures as required.</p>
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[1] H: High; M: Moderate; L: Low.

[2] The 12 LIFT Conflict-Sensitivity Principles are: (1) Understand the conflict; (2) Meaningful consultation with all local stakeholders; (3) Engage with power holders; (4) Encourage cooperation across conflict lines; (5) Transparency and coordination; (6) Meaningful involvement and participation of local and national civil society organizations; (7) Meet the priority needs of conflict affected populations; (8) Inclusion and non-discrimination; (9) Pragmatism and flexibility; (10) Establish feedback, accountability and grievance mechanisms; (11) Develop a project exit strategy; (12) Operationalize the principles throughout the programme lifecycle.

https://www.lift-fund.org/sites/lift-fund.org/files/publication/Conflict%20Sensitivity%20Principles%20REVISED%20for%20LIFT%202019-2023_0.pdf

[3] <https://www.adb.org/sites/default/files/linked-documents/51242-002-sd-10.pdf>

[4] <http://www.fao.org/3/ca9064en/ca9064en.pdf>

6. Institutional Arrangement and Coordination

Describe the institutional arrangement for project implementation. Elaborate on the planned coordination with other relevant GEF-financed projects and other initiatives.

6.a Institutional arrangements for project implementation.

The Ministry of Natural Resources and Environmental Conservation (MONREC) and the Ministry of Agriculture, Livestock and Irrigation (MOALI), or another designated Operational Partner (OP), will have the overall executing and technical responsibility for the project, with FAO providing oversight as GEF Agency as described below. The OP will act as the lead executing agency and will be responsible for the day-to-day management of project results entrusted to it in full compliance with all terms and conditions of the Operational Partnership Agreement signed with FAO. The OP is responsible and accountable to FAO for the timely implementation of the agreed project results, operational oversight of implementation activities, timely reporting, and for effective use of GEF resources for the intended purposes and in line with FAO and GEF policy requirements.

During the PPG process, an operational capacity assessment of MONREC and MOALI was initiated with the intention of both ministries being the main executing partners for the project. However, due to the political situation in the country it has not yet been completed. Thus, the implementation arrangements are yet to be finalized once the activities can be resumed. In addition, several NGOs are expected to be involved in the execution through LOAs. **Note:** The identified Operational Partner (OP), results to be implemented by the OP and budgets to be transferred to the OP are non-binding and may change due to

FAO internal partnership and agreement procedures which have not yet been concluded at the time of submission.

A Project Steering Committee (PSC) and a Project Management Unit (PMU) will be established to ensure satisfactory delivery, monitoring and reporting of project outputs. The PSC, comprised of representatives from various sectors of society, will provide policy and strategic advice for project implementation, and communicate project outcomes with other ministries.

Responsibilities of the PMU will include project implementation planning, budgeting, preparation of bidding documents for all services to be procured, awarding contracts, engaging consultants, assuring quality assurance for all project-financed activities, disbursement of funds, assuring compliance with due diligence, liaising with relevant ministries and their subnational agencies, establishing project performance and financial management systems, and assuring regular progress reporting to regional and national authorities as well as financing institutions. The PMU will appoint incremental staff to assist in day-to-day project management activities. The PMU will be supported by project management and implementation consultants.

The project will coordinate with relevant agencies and projects (described below as well as in the section on associated baseline projects) to build on synergies and areas for collaboration with these other initiatives. Key findings and lessons learned that can be upscaled and outscaled as well as existing gaps that can be addressed by this project have been identified. Coordination with the GCF-funded NAP Readiness (through UN Environment), Chindwin River Basin (through FAO) and the 'Enhancing Climate Resilience in the Third Pole' initiative (through WMO) will also help to establish GCF-LDCF complementarity efforts, thereby laying ground for enhanced coordination with future planned GCF investments in the country.

Detailed project implementation plans and schedules will be developed annually, involving all the key stakeholders at ministerial, regional, district and township levels, with PMU taking the lead. The project will implement adaptive learning and management based on regular monitoring and evaluation, as explained in Output 4.1. As part of this approach, the Theory of Change and intervention strategy will be regularly reviewed by the Project Steering Committee and other project stakeholders, and adjusted as needed. This adaptive learning and management will also be influenced by outcomes of the community-based vulnerability assessments, adaptation planning and monitoring implemented under Component 2, as well as the priorities identified by the value chain network under Component 3. The project reporting system will be based on the monitoring and evaluation system, and will include six-monthly, annual, mid-term and terminal reports. During the first year of the project, additional household data will be collected as part of a baseline survey to complement the data collected during PPG and to ensure that project progress can be properly assessed.

The anticipated project organization structure (yet to be confirmed) is as follows:

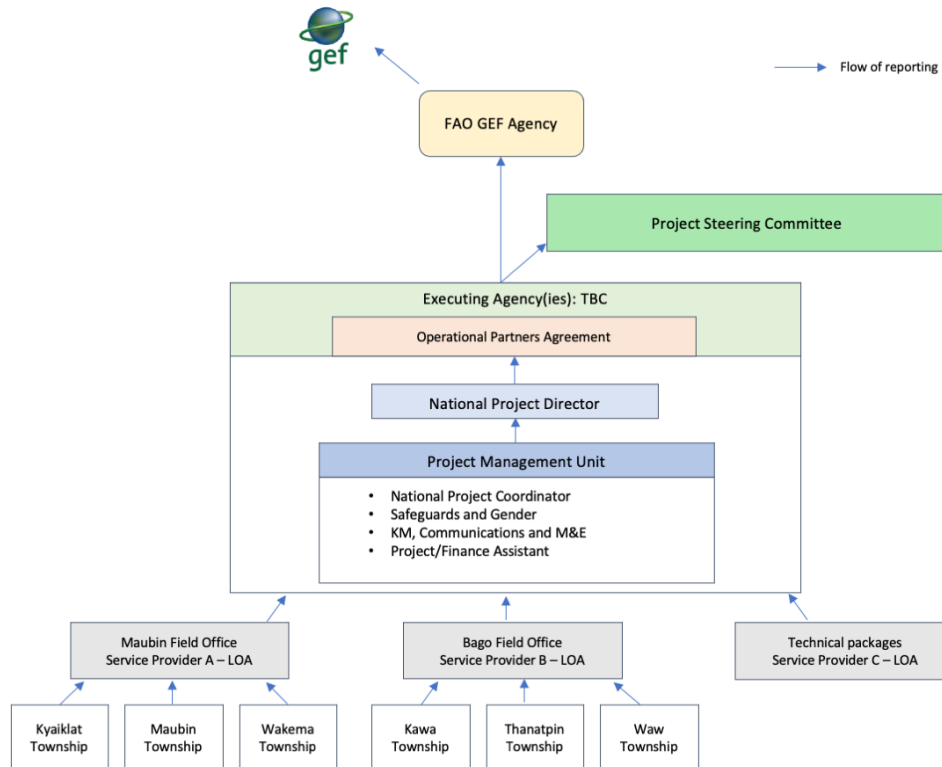


Figure 25: Project organization structure

The PSC will approve Annual Work Plans and Budgets on a yearly basis and will provide strategic guidance to the Project Management Team and to all executing partners. The members of the PSC will each assure the role of a Focal Point for the project in their respective agencies. Hence, the project will have a Focal Point in each concerned institution. As Focal Points in their agency, the concerned PSC members will: (i) technically oversee activities in their sector; (ii) ensure a fluid two-way exchange of information and knowledge between their agency and the project; (iii) facilitate coordination and links between the project activities and the work plan of their agency; and (iv) facilitate the provision of co-financing to the project.

The National Project Coordinator (see below) will be the Secretary to the PSC. The PSC will meet at least twice per year to ensure: i) Oversight and assurance of technical quality of outputs; ii) Close linkages between the project and other ongoing projects and programmes relevant to the project; iii) Timely availability and effectiveness of co-financing support; iv) Sustainability of key project outcomes, including up-scaling and replication; v) Effective coordination of governmental partners work under this project; vi) Approval of the Annual Work Plan and Budget; vii) Making by consensus, management decisions when guidance is required by the National Project Coordinator of the PMU.

A Project Management Unit (PMU) will be established by the OP and co-funded by the GEF grant. The main functions of the PMU, following the guidance of the Project Steering Committee, are to ensure overall efficient management, coordination, implementation and monitoring of the project through the effective implementation of the annual work plans and budgets (AWP/Bs). The PMU will be composed of a National Project Coordinator (NPC) who will work full-time for the project lifetime. In addition, the PMU will include a National Knowledge Management and M&E Specialist, a National Safeguards and Gender Specialist, and a Project/ Finance Assistant.

The National Project Coordinator and Technical Lead (NPC) will oversee daily implementation, management, administration and technical lead and supervision of the project, under the supervision of the NPD. S/he will be responsible, among others, for:

- i) Overall technical lead for the implementation of all project outputs and activities and ensure technical soundness of project implementation;
- ii) Technical lead for the implementation of Outputs 1.1 (Mechanisms for improved cross-sectorial coordination), 1.3 (Climate change adaptation priorities incorporated into policies), 2.1 (Targeted capacity building for local public and private institutions), and 3.1 (Value chain network established).
- iii) Coordination with relevant initiatives;
- iv) Ensuring a high level of collaboration among participating institutions and organizations at the national and local levels;
- v) Ensuring compliance with all Operational Partners Agreement (OPA) provisions during the implementation, including on timely reporting and financial management;
- vi) Coordination and close monitoring of the implementation of project activities;
- vii) Lead and supervise the preparation of various technical outputs, e.g. knowledge products, reports and case studies;
- viii) Ensure meaningful engagement of stakeholders as per the Stakeholder Engagement Plan;
- ix) Ensure that all the project resources are used solely to achieve project objectives as per the approved work plan and budget as per the government financial policies and FAO/GEF requirements;
- x) Tracking the project's progress and ensuring timely delivery of inputs and outputs;
- xi) Providing technical support and assessing the outputs of the project national consultants hired with GEF funds, as well as the products generated in the implementation of the project;
- xii) Approving and managing requests for provision of financial resources using provided format in OPA annexes;
- xiii) Monitoring financial resources and accounting to ensure accuracy and reliability of financial reports;

- xiv) Ensuring timely preparation and submission of requests for funds, financial and progress reports to FAO as per OPA reporting requirements;
- xv) Maintaining documentation and evidence that describes the proper and prudent use of project resources as per OPA provisions, including making available this supporting documentation to FAO and designated auditors when requested;
- xvi) Implementing and managing the project's monitoring and communications plans;
- xvii) Organizing project workshops and meetings to monitor progress and preparing the Annual Budget and Work Plan;
- xviii) Submitting the six-monthly Project Progress Reports (PPRs) with the AWP/B, and the quarterly financial reports, to the PSC and FAO;
- xix) With support from the Knowledge Management and M&E Specialist, preparing the first draft of the Project Implementation Review (PIR);
- xx) Supporting the organization of the mid-term review and terminal evaluation in close coordination with the FAO Budget Holder and the FAO Independent Office of Evaluation (OED);
- xxi) Submitting the OP six-monthly technical and financial reports to FAO and facilitate the information exchange between the OP and FAO, if needed;
- xxii) Informing the PSC and FAO of any delays and difficulties as they arise during the implementation to ensure timely corrective measure and support;
- xxiii) Prepare terminal report draft to FAO six months before the completion date of the Operational Partners Agreement (OPA).

The Food and Agriculture Organization (FAO) will be the GEF Implementing Agency (IA) for the Project, providing project cycle management and support services as established in the GEF Policy. As the GEF IA, FAO holds overall accountability and responsibility to the GEF for delivery of the results. FAO Project Task Force (PTF) is a management and consultative body established for the FAO project activities, that consists of designated FAO staff possessing the appropriate authority and skills mix to ensure effective technical, operational and administrative project management throughout the project cycle (see Annex J for details):

- ? The Budget Holder, is accountable for managing to achieve project goals and proper use of resources. Usually the most decentralized FAO office, the BH will provide oversight of day to day project execution;
- ? The Lead Technical Officer(s), drawn from across FAO will provide oversight/support to the projects technical work in coordination with government representatives participating in the Project Steering Committee;
- ? The Funding Liaison Officer(s) within FAO will monitor and support the project cycle to ensure that the project is being carried out and reporting done in accordance with agreed standards and requirements;

? The HQ Technical Officer is accountable for advising and supporting the LTO in ensuring project formulation, appraisal and implementation adhere to FAO corporate technical standards and policies.

FAO responsibilities, as GEF agency, will include:

- ? Administrate funds from GEF in accordance with the rules and procedures of FAO;
- ? Oversee project implementation in accordance with the project document, work plans, budgets, agreements with co-financiers, Operational Partners Agreement(s) and other rules and procedures of FAO;
- ? Provide technical guidance to ensure that appropriate technical quality is applied to all activities concerned;
- ? Conduct at least one supervision mission per year; and
- ? Reporting to the GEF Secretariat and Evaluation Office, through the annual Project Implementation Review, the Mid Term Review, the Terminal Evaluation and the Terminal Report on project progress;
- ? Financial reporting to the GEF Trustee.

6.b Coordination with other relevant GEF-financed projects and other initiatives.

In addition to the projects and programmes described in the baseline section, the RiceAdapt project will build on and scale up best practices of GEF projects and adaptation initiatives in the country. Further to that, the proposed project will draw on the existing and planned investment in the agriculture and water sectors in the targeted areas. Close coordination with these initiatives will ensure the projects' impact at scale while avoiding potential duplication of effort.

Project/programme	Links with GEF-7 LDCF project
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1) FAO GEF-5
?Sustainable
cropland and
forest
management in
priority agro-
ecosystems of
Myanmar? project
(SLM Project)

2016-2021, USD
6.2 million

This GEF-funded project supports and promotes climate smart agriculture (CSA), sustainable land management (SLM) and sustainable forest management (SFM) policies, techniques and practices in three agroecological zones of Myanmar (one site being Labutta township in the Delta). The RiceAdapt project draws directly from several outputs of this project. Firstly, a Farmer Field School (FFS) programme has been implemented in 20 villages of Labutta to promote CSA techniques on rice and green gram cultivation. A CSA Centre has been established at Yezin Agricultural University (YAU) in close collaboration with MOALI. A CSA Handbook, FFS Curriculum and FFS Handbook[1] have been developed. A Township Agriculture Extension Plan for Labutta has also been drafted. Simple market and needs assessments and a value chain analysis were conducted through discussion with relevant stakeholders for the target crops.

The value chain analysis identified the following strategies for developing improved business models in Labutta township:

- a. ?Firm-level upgrading?: Upgrading an existing business model making it more profitable for enterprises and improving its economic viability;
- b. Supporting start-ups: Creation of new types of (SME) business models;
- c. Generating and promoting new business ideas; and
- d. Preparation of business plans.

The Mid-Term Review (2019) conducted for this project highlighted several lessons learned that have been taken into account in the RiceAdapt project design. Among others, these include:

- ? A major assumption of the project design was that conducting training/capacity building with improved knowledge management will automatically lead to broad scale implementation and the achievement of large emissions targets. However, this assumption has not been fully realized. Consequently, the direct land and emissions targets were reduced to a more realistic level. Also, the FFS approach is seldom replicable or upscalable by government extension services working on their own.
- ? The CSA Centre has been well-established at YAU and shows signs of potentially becoming a ?Centre of Excellence? for CSA in Myanmar after project support ends.
- ? The MTR identified the following barriers and challenges in Myanmar?s extension services: There is insufficient staffing at township level. In several townships, the total number of trained extension staff is less than 20. Staff rotations are sometimes quite short; officers receiving capacity building may be transferred to another post where they cannot apply what they have learned. Furthermore, budgets are insufficient to cover extension activities, and transportation costs are seldom covered ? one staff will have to cover large areas and/or a large number of households.
- ? Monitoring, except for production estimates and production estimates/area, is not an integral part of planning and budgeting cycles.

? SBL in its currently promoted form in Myanmar is not easily applicable in

<p>2) FAO GEF-5 LDCF ?FishAdapt: Strengthening the Adaptive Capacity and Resilience of Fisheries and Aquaculture-dependent Livelihoods in Myanmar? project</p> <p>2017-2022, USD 6 million</p>	<p>The FishAdapt project is implemented in three pilot sites in Yangon (Kyauktan Township), Rakhine (Myebon Township) and Ayeyarwady (Ah Mar of Pyapon Township). Its objective is to assist government to enable inland and coastal fishery and aquaculture stakeholders to adapt to climate change by understanding and reducing vulnerabilities, piloting new practices and technologies, and sharing information. The project promotes the Ecosystem Approach to Fisheries Management and Aquaculture. Rapid vulnerability assessments (VAs) were conducted in 49 fishery communities. As part of this process, unmanned aerial vehicle (UAV) aerial mapping was conducted at the community level.</p> <p>The RiceAdapt project will incorporate lessons learned from the FishAdapt project in relation to adaptation planning and implementation, integrating them into a multi-sector, landscape and livelihoods approach.</p> <p>The Mid-Term Review (2020) of the project included the following recommendations and lessons learned of relevance to the RiceAdapt project:</p> <ul style="list-style-type: none"> ? The project document is an ambitious and unwieldy effort at encompassing a vast area and a huge number of issues. By the time the remaining CC VA assessments are completed, the project will still have achieved only 20% of its outputs under the two outcomes. ? The project document was also ambitious in terms of setting the quantitative targets. The geographical spread of 120 villages (which itself is an overwhelming number which affects the quality of delivery for a project like this) over three large areas, with access to many villages constrained by long distances and poor transport services, has seriously upset the project workplans. This is particularly aggravated during the monsoon months when several villages in the Ayeyarwady Delta become extremely difficult to reach. ? The current system of working with LOAs ? though logistically convenient in ensuring faster administrative clearances ? may not be strategically appropriate. The NGOs strengths lie in community engagement and continued hand-holding until new initiatives like the ecosystem approach to fisheries management could take root, but their involvement only at the level of implementation of some field-level tasks overlooks their strengths. ? The division of labour between DOF and NGOs in the village-level assessments and training could have been better organised. Currently, the DOF staff who have the technical expertise to undertake training are only employed as community facilitators, which is frequently an uneasy role for them. The NGOs, who have good experience of community engagement and mobilisation, are given the responsibility to implement technical training for which they may not always be well suited. ? The need for the PMU to seek prior clearance from the NPD/DOF for all its activities is often a time-consuming process, affecting the performance of an already-delayed project. ? The issue of translation ? and lack of budgetary provision ? remains an important bone of contention for the project, as a constraint for effective and timely actions in project implementation and also possibly in the uptake of its results.
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<p>3) FAO GEF-6 LDCF MyCoast: Ecosystem-Based Conservation of Myanmar's Southern Coastal Zone? project</p> <p>Expected 2021-2025, USD 3 million</p>	<p>The MyCoast project, pending approval by GEF, is expected to start in 2021. The project aims to improve marine and coastal zone management in southern Tanintharyi Region to benefit marine biodiversity, climate change mitigation, and food security. Under Component 1, national and region/state capacities will be developed to plan and implement strategic coastal conservation management based on integrated coastal zone management principles. Under Component 2, equivalent local capacities will be built and integrated coastal zone management (ICZM) will be demonstrated in practice in one or more selected geographic areas of southern Tanintharyi Region, with a focus on the Myeik Archipelago.</p> <p>There will be opportunity for the exchange of lessons learned between the two projects, but no geographical overlap.</p>
<p>4) ADB & Global Agriculture and Food Security Program (GAFSP): Climate-Friendly Agribusiness Value Chain Sector Project</p> <p>2018-2025, USD 40.5 million (loan) and 27 million (grant)</p>	<p>The Climate-Friendly Agribusiness Value Chain Sector Project provides support to improve access to land, water, finance and skills necessary for the rural poor in the Central Dry Zone (CDZ) to engage in productive livelihoods activities. This includes supporting services that reduce malnutrition among children, increase households access to financial services, and create opportunities for the rural poor to engage in the non-farm economy. The project will increase competitiveness in value chains for rice, beans, pulses, and oilseeds in the Magway, Mandalay, and Sagaing regions in the CDZ. The project will also improve climate resilience for critical rural infrastructure, promote quality and safety testing capacity, strengthen technical and institutional capacity for climate-smart agriculture (CSA), and create an enabling policy environment for climate-friendly agribusinesses. The project will reduce food insecurity and rural poverty, increase smallholders' incomes and access to markets, and improve resource efficiency and environmental sustainability for agribusinesses. The project will target women and households who are landless or are farming less than two hectares.</p> <p>Although located in different geographic/agroecological regions, exchange with this project will be sought when improving national and regional level capacities in promoting CSA and climate-smart value chain development.</p>

<p>5) FAO-GCF ?Climate-resilient Agriculture, Forestry and Land-use in Chindwin River Basin? (CAFOLU- Chindwin) project</p> <p>Expected 2021- 2027, USD 31 million</p>	<p>FAO is supporting the Government of Myanmar in implementing a GCF Readiness project ?NDA Strengthening & Strategic Frameworks?. Among others, the project is supporting the development of a full-scale project proposal on ?Climate-resilient Agriculture, Forestry and Land-use in Chindwin River Basin?, which will demonstrate an ecosystem-based approach, using the Decision Support System (DSS).</p> <p>The overall goal of the CAFOLU-Chindwin project is to transform the Chindwin River Basin (CRB) into a climate-resilient and low-emission region of Myanmar. The project objective is to develop the enabling conditions for increased public and private investments in low-emission and climate-resilient agriculture, forestry, and land-use in the CRB, moving the region towards the status of an ?investment ready jurisdiction?. Among others, the project aims to strategically increase the number of agro-meteorological stations, and strengthen data, information analysis by the DMH to improve the existing agro-meteorological bulletins. It will also raise awareness of climate and disaster risks, use of agromet information, forecasts and early warning and improve advisory services for adapting crop planning and farming practices. The project will scale up the adoption of climate-resilient and low-emission farming practices. It will develop at least two climate-resilient and/or low-emission value chains for sustainably produced rice and other staple crops through public-private partnerships (PPPs). The project will also promote knowledge sharing and dissemination within the Ayeyarwady River Basin, with other river basin organizations, and at the Union level for institutionalization and scaling up in other river basins.</p> <p>While not implemented in the same geographic region, the RiceAdapt project will exchange closely with the GCF Chindwin River Basin project, in particular for national policy, value chain development, agro-meteorological services, and integrated water resources/river basin management.</p>
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6) Sustainable Rice Landscapes Initiative (SRLI)

The Sustainable Rice Landscapes Initiative (SRLI) is a partnership of FAO, SRP, the WBCSD (World Business Council for Sustainable Development), GIZ, IRRI and UN Environment. Launched in 2018, during the 6th GEF Assembly meeting in Danang, Viet Nam, the SRLI has created a unique consortium of public, private and civil society partners, bringing together technological, ecological, policy and market-led approaches to the challenges of rice sustainability. The main objective of the SRLI partners in this initiative is to harness multiple opportunities to meet the growing global demand for sustainable rice and associated benefits, using a public-private partnership approach towards achieving the UN Sustainable Development Goals (SDGs).

The inclusion of the RiceAdapt project in the regional framework offered by the SRLI will significantly increase its potential to contribute to achieving transformative impact both nationally and across the Southeast Asia region as a whole, for example as follows:

- Links to the SRLI will increase access by producers in the target area to regional and global value chains, including 'green' value chains that reward environmental sustainability: inter-country collaboration will also allow countries to achieve a critical mass of influence on markets.
- SRLI members have the potential to act as catalysts and conduits for knowledge management spanning the region on the integrated management of rice-based landscapes, allowing to lessons learned through this project and others in the region to be communicated widely and effectively and thereby to guide good practice.
- Regional coordination on M&E, for example through the SRLI and the KMS tool being developed by ICRISAT, will allow the impacts of the GEF-7 Food Systems, Land Use and Restoration Impact Program (FOLUR IP) to be monitored at sub-programmatic (regional) level, thereby allowing synergies among FOLUR/SRLI countries in SE Asia to be captured and collaborative responses to be agreed among participating countries.
- The establishment of an action group with SRLI and other partners will facilitate engagement with finance providers regarding the development of blended finance products with potential for application across the region, linked to the provision of technical assistance on sustainable rice production.

The table below shows the scale of the reach of the SRLI throughout the region, and therefore the extent of its potential impact as a regional catalyst for identifying and channelling resources and opportunities, and for managing and exchanging knowledge.

Country	Funding Source	Project Name	IA
Vietnam	FOLUR	Food System, Land Use and Restoration Impact Program in Vietnam	FAO

<p>7) UN Environment GEF-5 LDCF ?Adapting Community Forestry landscapes and associated community livelihoods to a changing climate, in particular an increase in the frequency and intensity of extreme weather events?</p> <p>2020-2024, USD 5 million</p>	<p>The objective of the project is to reduce the vulnerability of local communities in Myanmar to climate change through implementation of Ecosystem-based Adaptation (EbA) and improvement of early warning systems (EWS). This objective will be achieved by enhancing knowledge on EbA and integrating this approach into Community Forestry and planning for associated livelihoods in Chauk township (Central Dry Zone), Hinthada township (Ayeyarwady Region) and Myebon township (Rakhine Coastal State).</p> <p>Among others, the project will establish Local Adaptation Planning Committees (LAPCs) in the target townships to improve cross-sectoral planning and preparedness that supports appropriate response to early warnings received. The project will also install automatic weather/water level stations for monitoring and forecasting extreme weather events.</p> <p>The RiceAdapt project will build on methodologies and approaches for vulnerability assessment and EWS developed by this project and integrate the lessons learned through the community forestry landscapes project into a multi-sector resilient landscape management framework.</p>
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<p>8) UNDP GEF-6 LDCF ?Reducing Climate Vulnerability of Coastal Communities of Myanmar through an Ecosystem-based approach? project</p> <p>Planned 2020-2024, USD 7 million, pending CEO endorsement</p>	<p>The objective of this project is to strengthen the protection of vulnerable coastal areas and communities against the adverse impacts of climate change and climate variability by adopting an ecosystem based adaptation approach in the Rakhine State of Myanmar. The project is executed by MONREC. Among others, the project will promote climate resilient agricultural practices and sustainable alternative livelihoods including: climate resilient crops, agronomic practices to reduce crop failures (e.g. saline resilient rice varieties, crop rotations); alternative livelihoods and employment that diversify farm income and reduce risks (e.g. integrated fish fruit and forest farming; improved livestock rearing; engagement in eco-tourism activities). The project will also support the establishment of cross-sectoral institutional coordination mechanism for planning, budgeting implementation, monitoring and enforcement of coastal adaptation plans.</p> <p>The project will develop a methodology for participatory community-level assessment and planning (e.g. community-based climate, environmental management and disaster vulnerability/risk assessment and community adaptation planning process). Community-level activities will be initiated with the formation of a Livelihood Forum in each target village tract, an inclusive multi-stakeholder platform following the approach taken in the Rakhine Area Based Programme. The project also aims to strengthen the resilience of mangrove ecosystems in four townships of Rakhine State.</p> <p>There will be opportunities for exchanges of lessons learned, especially with regard to community-based vulnerability assessments and planning, nature-based solutions, and climate-resilient agriculture, but there is no geographical overlap.</p>
<p>9) WWF-US GEF-7 Mainstreaming biodiversity conservation and restoring forest landscape connectivity in Bago Region, Myanmar (under development)</p>	<p>The objective of this project is to improve landscape-level land-use planning and promote community land management for conservation of globally significant biodiversity, including Asian elephants, in Myanmar. The project will mainstream biodiversity conservation approaches in land use and development planning. It will initiate landscape connectivity improvement across an area of at least 367,000 ha within Bago Yoma landscape through forest restoration and re-wilding of 10,000 ha of degraded areas, 50,000 ha of Community Forests, to be anchored by the North Zamari Wildlife Sanctuary (NZWS) protected area of 98,000 ha with improved management. While this project will be implemented further north of the RiceAdapt project sites in Bago Region, upstream-downstream linkages between the two projects will be taken into consideration and exchange fostered during implementation.</p>

<p>10) Flood Mitigation Work for Sittaung Valley (Pyuntasa Plain) and Bago, Waw, Thanatpin, Kawa Townships (IWUMD, 2012-2023, USD 110 million)</p>	<p>The project involves construction of the 29-miles Taroo-Sinywa embankment together with 27 appurtenant hydraulic structures and a 20-miles irrigation drainage to help prevent flooding in the Townships of Pyuntasa, Bago, Waw, Thanatpin and Kawa. Since Sittaung River Basin and the Bago-Waw-Thanatpin-Kawa area are flood prone regions, crops cannot be grown in approximately 90,000 acres of farmlands in these areas during rainy season. With the flood mitigation works, local farmers will be able to cultivate rice and other crops even during the rainy season. The project is expected to reduce occurrence of floods in Sittaung Valley, thereby improving the socio-economic condition of farmers and supporting development of the country's agriculture sector.</p>
<p>11) UN Environment GCF readiness projects</p>	<p>1) GCF Strategic Frameworks support for Myanmar: This GCF readiness project, implemented by UN Environment and the Climate Technology Centre and Network (CTCN), was aimed at strengthening water management and increasing adaptation to climate variability and climate change with specific focus on these areas, through the use of a web-based portal. The drought and flood management portal (www.flooddroughtmonitor.com) will allow rapid access and use of freely available, reliable, near real time satellite data and information that can strengthen the basis for informed planning, decision-making and management action.</p> <p>2) Adaptation planning support for Myanmar (approved in 2020): The objective of this project is to enhance institutional and technical capacity of the Government of Myanmar to undertake the process of formulation and implementation National Adaptation Plan (NAP) including the mechanism of updating the NAP on a regular basis and, compile and communicate aggregated results of reduction of vulnerability, increase adaptive capacity, and status of integration of climate change into development planning. At the state and region level, the General Administration Department (under the Ministry of Home Affairs) will be instrumental in the NAP process as well, as it administers the country's state and region level activities at district and township level.</p> <p>Among others, the project aims to enhance capacity to use climate information for adaptation planning. Downscaled climate scenarios will be produced for three states and regions representing the three main agro-ecological zones of Myanmar with technical support, and in close collaboration with the government. Associated training and capacity-building tools on the process will be developed in a manner that will help enable a cadre of national experts to understand the process and assess how this can be scaled up to provide an indicative assessment covering the whole country.</p> <p>The RiceAdapt project will benefit from the outcomes of this project in particular with regard to climate scenarios and national capacity building.</p>

<p>12) World Bank Agricultural Development Support Project (ADSP)</p> <p>2015-2022, USD 100 million</p>	<p>The objective of the ADSP project for Myanmar is to increase crop yields and cropping intensity in selected existing irrigation sites in Bago East, Nay Pyi Taw, Mandalay, and Sagaing regions. The project consists of four components. The first component, irrigation and drainage management aims to support more responsive and reliable provision of irrigation and drainage services in the project irrigation sites to enable an increase in irrigation area coverage, and to result in better farm productivity and distribution of benefits between upstream and downstream users. Water User Groups (WUGs) have been established. The second component, farm advisory and technical services seeks to enhance MOALI technology development and farm advisory services in target townships which host project irrigation sites to increase farm productivity. The third component, project coordination and management will finance establishment of the monitoring and evaluation (M&E) and management information systems and associated technical advisory (TA) services. The fourth component, contingent emergency response will allow a rapid reallocation of credit proceeds from other components to provide emergency recovery and reconstruction support following an eligible crisis or emergency.</p> <p>Although there is no direct geographic overlap, the RiceAdapt project will build on this initiative's efforts in promoting sustainable agricultural value chains as well as improved irrigation and drainage management.</p>
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13) World Bank
National Food
and Agriculture
Systems project

2020-2025, USD
200 million

The objective of this project is to increase agricultural productivity and diversification and to enhance market access for selected value chains in the project area (Mandalay, Magway, **Bago**, **Ayeyarwady**, and Sagaing), and respond to an eligible crisis or emergency. The project has been designed as an immediate response to the COVID-19 pandemic. It supports the restoration of the agriculture supply chain by supporting farmers timely access to inputs, which has been disrupted by the global and local lock down and limited movement. At the recovery stage, the project will support the strengthening of the agriculture sector by: developing digital extension services to raise awareness on COVID-19 and food safety; strengthening digital agriculture technology; developing online transaction platforms for inputs; and supporting value chain development such as by linking farmers with markets.

Among others, the project supports the development of Myanmar's area-specific fertilizer recommendation system. The current nation-wide single standard for fertilizer applications will be replaced by area, soil, and crop specific fertilization recommendations, which will result in more tailored fertilizer recommendations to be specifically adapted to the respective areas, reducing fertilizer use and GHG emissions. In situations where there is shortage of chemical fertilizers due to COVID-19 related disruptions, the area specific fertilizer recommendation application which provide alternative fertilizers, such as organic compost. The app will support farmers in deciding about the balance between animal manure, other organic manure (e.g. compost), and/or chemical fertilizer and recommend amounts to be applied. This activity will be implemented in the selected districts in five regions (Mandalay, Magway, Bago, Ayeyarwady, and Sagaing) and will specifically target women, smallholder farmers, marginal and landless farmers, and ethnic minorities.

While it is not yet clear whether there will be direct geographic overlap (at the township/village level), the RiceAdapt project will closely collaborate and exchange with this project with regard to extension services, climate-resilient agriculture, and COVID-19 response in Ayeyarwady and Bago regions.

<p>14) IFAD Eastern States Agribusiness Project</p> <p>2018-2024: USD 56.7 million</p>	<p>The Eastern States Agribusiness Project (ESAP) aims to develop an inclusive, sustainable and scalable model for smallholder agriculture and community agroforestry in the eastern states of Kayin and Shan (South). The project will promote commercialized smallholder agriculture linked to agribusiness; improve living standards in forest communities; reverse environmental degradation in sloping areas; and generate substantial benefits for households belonging to the Karen, Shan, Paoh, Intha and Mon ethnic groups. The target group consists of poor rural women and men in the project areas. These include farmers in irrigated lowlands, farmers in the rainfed uplands, and agroforestry households in mountainous areas of northern Kayin.</p> <p>The RiceAdapt project will build on the practices supported by ESAP, with emphasis on mainstreaming climate resilience into agribusinesses, and facilitating market linkages.</p>
<p>15) GCF-WMO Enhancing Climate Resilience in the Third Pole Concept stage</p>	<p>The proposed Enhancing Climate Resilience in the Third Pole seeks to strengthen the use of weather, water and climate services in the LDCs across the Third Pole region (the Hindu Kush-Himalayan ecoregion) including Myanmar to adapt to climate variability and change and to apply well-informed risk management approaches and will be implemented under the umbrella of the Global Framework for Climate Services (GFCS). The programme's objectives will be achieved by strengthening regional support networks and institutional capacities, developing tools and products that are needed for anticipating climate variability and change. The programme's direct and indirect beneficiaries from the region will gain access to critical weather and climate information, which will result in reduced disaster risk, improved water resources management and improved agricultural productivity.</p> <p>This GCF project is currently on hold. If confirmed, the RiceAdapt project will coordinate closely with the GCF Third Pole project and will complement and build on the activities implemented in Myanmar. In particular, the project will ensure close coordination with WMO on project activities related to risk assessments and climate information services to address gaps, enhance synergies and avoid duplication of efforts.</p>

<p>16) SDC Gulf of Mottama Project (GoMP)</p> <p>2015-2021, CHF 12 million</p> <p>Implemented by a consortium of Helvetas, IUCN, Network Activities Group (NAG), and Biodiversity and Nature Conservation Association (BANCA)</p>	<p>The Gulf of Mottama project aims to strengthen the capacities of government and communities to effectively manage, govern and value its coastal natural resources to sustainably improve livelihoods of people depending on them, while reducing the pressure on natural resources and conserving its unique environment and threatened biodiversity. The GoMP project is implemented in coastal townships of Mon State (Kyaikto, Bilin and Thaton) and Bago Regions (Kawa and Thanatpin). In Bago, the project works in 24 villages (14 in Kawa, 8 in Thanatpin and 2 in Waw) within a radius of 10 miles from the coast. The project has supported the development of a Management Plan for the Gulf of Mottama Ramsar Site[3] (which includes, among others, community-based disaster risk management (CBDRM) planning and adaptation, improving fisheries and on-farm livelihoods) and is supporting its implementation.</p> <p>The RiceAdapt project will complement and build upon lessons learnt for improving livelihood security for vulnerable women and men in targeted coastal areas of the Gulf of Mottama, through sustainable and equitable use of natural resources and diversification of livelihoods. It will also coordinate with this project for the implementation of nature-based solutions (NBS).</p>
<p>17) Myanmar Climate Change Alliance (MCCA) programme, Phase-2</p> <p>2020-2025, USD 8.1 million as part of the Global Climate Change Alliance (GCCA)</p>	<p>The MCCA programme, implemented by the United Nations Human Settlements Programme (UN-Habitat) and UN Environment, in collaboration with ECD, supports the Government of Myanmar in addressing the challenges posed by climate change. The primary objective of Phase-1 was to mainstream climate change into the Myanmar policy development and reform agenda, and the Myanmar Climate Change Policy, and accompanying Myanmar Climate Change Strategy and Master Plan, was a direct result of these efforts. MCCA-2 will support the Government of Myanmar to deepen integration of climate change adaptation and mitigation into Myanmar's national priorities toward becoming a climate resilient, low-carbon society that is sustainable, prosperous and inclusive.[4]</p> <p>Under the MCCA Phase-1, a Climate Change Vulnerability Assessment Manual[5] and a Handbook for Local Climate Resilience Planning[6] were developed. Based on this, the project conducted detailed vulnerability assessments for Labutta (Ayeyarwady region)[7], Pakokku (Magway Division) and Hakha (Chin State). The RiceAdapt project will benefit from these handbooks and assessments.</p>

18) USAID projects

In 2013, USAID published a "Background Paper on Rice Productivity Improvement in Myanmar"[8]. The paper identified nine intervention areas in the rice production cycle where improvements in productivity and profitability can be achieved, as follows.

1. Seed selection
2. Land preparation
3. Crop establishment
4. Water management
5. Soil fertility management
6. Pest management
7. Harvesting and threshing
8. Drying and storage
9. Crop rotation

With the support of USAID and national partners in Myanmar, IRRI through the Stress-Tolerant Rice in Vulnerable Environments (STRIVE) project (completed), improved the ability of vulnerable smallholder farms to recover from natural disasters. Through the projects participatory varietal selection, five farmer-selected lines were released as commercial varieties. Together with best management practices, these varieties were able to produce a 12-30% increase in farm yield from 2014 to 2017.

Furthermore, under the USAID SERVIR-Mekong project, USAID is supporting the Government of Myanmar in improving early flood preparedness in collaboration with Myanmar's Department of Disaster Management under the Ministry of Social Welfare Relief and Resettlement. SERVIR-Mekong works closely with OneMap Myanmar and the Myanmar Information Management Unit (MIMU) to support Myanmar's progress in ensuring open access to spatial data. SERVIR-Mekong is using satellite-based monitoring tools to support Myanmar state agencies and communities to manage the risks better. The tool is helping the Myanmar government to monitor the changes in the river course at different locations from space and help communities on the ground to deal with riverbank erosion.

Fertilizer Sector Improvement (FSI) was a three-year project funded by the United States Agency for International Development (USAID) to improve food security and increase profitability for smallholder farmers by sustainably increasing agricultural productivity. The project was implemented by the International Fertilizer Development Center (IFDC) with collaborating partners in the targeted geographic focal areas of Ayeyarwady, Bago and Yangon. Under this project, a Gender Assessment was conducted in 2015, which has been used as a reference in the gender analysis conducted for the RiceAdapt project development.[9]

<p>19) International Water Management Institute (IWMI)</p>	<p>IWMI is implementing several programmes in Myanmar. In collaboration with IRRI and other partners, it is implementing a project on 'Transformation of rural landscapes for sustainable and nutritious food' under the Water, Land and Ecosystems (WLE) Program.</p>
<p>20) Climate and Nutrition Smart Villages (CSV)</p>	<p>The International Institute of Rural Reconstruction (IIRR), with support from the CGIAR Research Program on Climate Change, Agriculture and Food Security in Southeast Asia (CCAFS SEA), has worked for the establishment of Climate-Smart and Nutrition-Smart Villages (CSVs) to serve as platforms for scaling out Climate Smart Agriculture in the country. In the Delta, this includes Ma Sein village of Bogale Township.</p>
<p>21) JICA Project for Profitable Irrigated Agriculture in Western Bago Region</p> <p>2017-2022, USD 5.5 million</p>	<p>The project aims to increase agricultural production by developing irrigation systems in Western Bago Region, thereby contributing to improve living standards of farmers in the region and economic development of Myanmar.</p>
<p>22) Microfinance Facility Agreement for Myanmar Rural Development</p> <p>2014-2024, The Export-Import Bank of China, USD 400 million</p>	<p>The project is aiming to increase smallholders' access to finance in rural communities by providing micro-loans through agricultural cooperatives.</p>
<p>23) ACIAR Plant Health Myanmar research project[11]</p>	<p>Funded by the Australian Centre for International Agricultural Research (ACIAR) and led by the Centre for Agriculture and Bioscience International (CABI), the 'Plant Health Myanmar' research project, launched in 2019, is working with scientists of Myanmar to understand farmers' reliance on pesticides to fight a range of crop pests and diseases. Under the project, a 'Toxicology training' was conducted at Yezin Agricultural University, which covered the basics of insecticide resistance monitoring, principles of toxicological research, modes of action of insecticides, genetics of resistance development and general lab techniques.</p> <p>The RiceAdapt project will benefit from the outcomes of this project with regard to the developed capacity and awareness on integrated pest management and pesticide risk reduction.</p>

<p>24) Youth in Agribusiness Forum</p>	<p>The first Myanmar Youth in Agribusiness Forum was organized in collaboration with INGOs, NGOs, private companies, Yangon Regional Department of Agriculture, Yangon Regional livestock breeding and veterinary Department, Agriculture University Alumni Association (AUAA), University of Veterinary Science in May 2019 at the Central Agriculture Research and Training Center (CARTC) in Hlegu (Yangon). The forum was organized by AgriProFocus Myanmar, a Netherlands based non-profit agribusiness network organization, and was aimed at providing opportunities to youth to tap into the existing and emerging agribusiness opportunities and play meaningful leadership roles.</p> <p>The RiceAdapt project aims to build on this forum in order to engage youth in agribusiness as a means to support rural livelihoods and resilient agricultural production.</p>
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[1] FAO/AVSI (2019). Handbook on Climate Smart Agriculture.

<http://www.fao.org/3/ca3662en/ca3662en.pdf>

Farmer Field School Curriculum on Climate Smart Agriculture in Coastal/Delta Zone, Ayeyarwady Region.

<http://www.fao.org/3/ca3654en/ca3654en.pdf>

Handbook for Farmer Field School on Climate Smart Agriculture.

<http://www.fao.org/3/ca3815en/CA3815EN.pdf>

[2] See Pierre Ferrand and Hla Min (2013), ?SRI in Myanmar: Adoption and adaptation.?

www.ileia.org/2013/03/25/sri-myanmar-adoption-adaptation/

[3] Gulf of Mottama Management Plan (2019).

https://rsis.ramsar.org/RISapp/files/39465170/documents/MM2299_mgt191206.pdf

[4] <https://unhabitat.org/myanmar-climate-change-alliance-programme-enters-second-phase>

[5] https://www.burmalibrary.org/sites/burmalibrary.org/files/obl/VA-Manual_ENG_Full-Version_resized-red.pdf

[6] https://myanmar.un.org/sites/default/files/2019-11/Handbook_ENG_resized_0.pdf

[7] https://unhabitat.org/sites/default/files/2019/11/labutta-scenarios-for-resilience-building_compressed.pdf

[8]

https://www.themimu.info/sites/themimu.info/files/documents/Ref_Doc_Background_Paper_2_Rice_Productivity_Improvement_Mar2013.pdf

[9] <https://culturalpractice.com/wp-content/uploads/2-fsi-burma-gender-assessment-1.pdf>

[10] <https://www.winrock.org/wp-content/uploads/2019/12/VCRD-Soy-Value-Chain-20191024.pdf>

[11] <http://www.planthealthmyanmar.org/objectives.aspx>

7. Consistency with National Priorities

Describe the consistency of the project with national strategies and plans or reports and assessments under relevant conventions from below:

NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, INDCs, etc.

Myanmar's development agenda is guided by the **2011-2030 National Comprehensive Development Plan** and **2018-2030 Myanmar Sustainable Development Plan (MSDP)**[1], which provides a long-term vision for achieving inclusive and transformational economic growth. Recognizing the increasing threat from climate change, the MSDP underscores the need for a climate resilient development trajectory and outlines a strategy to 'increase climate change resilience, reduce exposure to disasters and shocks while protecting livelihoods', as part of delivering the goals of the MSDP. The MSDP also emphasizes SME development as a key driver of private sector-led economic growth and essential for sustained, broad-based job creation. The proposed LDCF project is fully aligned with those priority actions and strategies outlined in the MSDP and is expected to accelerate implementation progress for achieving the strategic goals related to natural resources and private sector growth.

The project is fully aligned with the **2016 - 2030 Myanmar Climate Change Strategy and Action Plan (MCCSAP)**, which spells out the overarching vision for a climate-resilient, inclusive development pathway and presents a roadmap to guide Myanmar's strategic responses and actions to climate-related risks and opportunities. At the higher level, the proposed project responds directly to first of MCCAAP's two main objectives, namely 'to increase the adaptive capacity of vulnerable communities and sectors so they are resilient to the impacts of climate change'. Doing so, the project activities cut across MCCSAP's six action areas, while making significant contributions towards achieving target sectoral outcomes, particularly those on 'Climate-smart agriculture, fisheries and livestock for food security' and 'Sustainable management of natural resources for healthy eco-system' along with their outlined responses. The implementation of the project will directly contribute to the delivery of the three expected results for achieving the sectoral outcomes: 1) climate change integration in relevant policies, planning and budgeting procedures, including gender considerations; 2) adoption of adaptation technologies and resilient management practices; and 3) establishment of institutional coordination and multi-stakeholder engagement framework to support the implementation in the agriculture sectors, including innovative business models and gender-sensitive approaches. The project will also contribute to priority areas for

?Education, science and technology for a resilient society? by strengthening information and education systems at various levels related to the project?s sectoral scope.

Following the MCCSAP, the government has recently (June 2019) adopted the **Myanmar Climate Change Policy**, and the project activities are aligned with the policy recommendations and measures within its six sectoral clusters, namely those related to a) food and water security; b) healthy ecosystems; f) knowledge, awareness and research. Furthermore, the project is directly aligned with the **Myanmar Climate Change Strategy (2018-2030)** and **Myanmar Climate Change Master Plan (2018-2030)**, which builds on the MCCSAP, including its strategic focus areas and high priority activities related to climate resilient agriculture for food security, sustainable management of natural resources for healthy ecosystems as well as building a resilient society through education, science and technology. In particular, the MCCMP presents a roadmap to transform Myanmar into a climate-resilient and carbon-efficient nation that is capable of harnessing the benefits of low-carbon, resilient development for present and future generations in a sustainable and inclusive manner.

At the sectoral level, the project responds to the **Myanmar Rice Sector Development Strategy**, by contributing to the resilience and sustainability of rice production, which is key to ensuring achievement of the goals for boosting rice production and ensuring food self-sufficiency. The project will also address barriers identified in the **National Export Strategy for Rice (2015-2019)** and contribute to objectives in relation to strengthening the rice sector to promote ?health, equitable growth and environmental sustainability.? The project is also in alignment with Myanmar?s **Climate Smart Agriculture Strategy** which is primarily focused on rice-based farming systems and outlines the priority programmes for adaptation in the targeted regions. Furthermore, the project is aligned with the **Myanmar Agriculture Development Strategy and Investment Plan (2018-2023)** including in terms of outputs such as ?improved resilience of farmers to climate change and disasters?.

Moreover, the proposed project is in alignment with Myanmar?s submissions under the UNFCCC. Its **Nationally Determined Contribution (NDC)** prioritizes the adaptation actions established by the NAPA, highlighting efforts to strengthen resilience in the agriculture sector, develop early warning systems along with forest preservation measures as top priorities. The NDC also outlines adaptation initiatives by the Government of Myanmar where the proposed project will contribute to the implementation including: *sectoral actions* on mainstreaming adaptation into planning, research to reduce vulnerability in subsistence farmers, etc.; *policy and legal instruments* such as assistance entitlements of farmers affected by disasters; and *capacity-building, education, awareness and communication* to provide technical support on disaster management.

The project responds directly to Myanmar?s **National Adaptation Programme of Action (NAPA) (2012)**, which prioritizes adaptation projects in the agriculture sector, giving first priority to reduced climate change vulnerability of rural and subsistence farmers through locally relevant technologies. The NAPA-proposed priority projects include the use of climate-resilient rice varieties, crop diversification,

and adaptation approaches to reduce climate change vulnerability and increase resilience of subsistence farmers, all of which are covered by the project's activities.

Myanmar submitted its **Initial National Communication (INC)** under the UNFCCC in 2012, which highlighted agriculture, water resources and biodiversity sectors as some of the most vulnerable areas to climate change in the country. The INC's vulnerability assessment for the agriculture sector indicates the Ayeyarwady Delta (the country's rice bowl) as being the most vulnerable region, followed by Bago and other regions. Ayeyarwady region is highlighted as a priority for crop yield and production changes and crop pattern change, while Bago region is highlighted as a priority for addressing plant pests and diseases. The project is in line with the strategies outlined in the INC for the agriculture sector, including the need to (i) improve rice cropping systems and water management, (ii) promote organic farming, (iii) do research and development on crop varieties adaptable to climate change. The project will contribute to both the mitigation measures and specifically adaptation actions on: adjusting cropping systems, improving farm management including post-harvest technology; use of stress-resistant plant varieties and ensure climate-resilient agriculture; promote water use conservation and efficiency; promote organic farming and use of bio-fertilizers, etc.

As highlighted above, the RiceAdapt project also contributes to Myanmar's COVID-19 Economic Relief Plan, in particular Goal 4 on "Easing the impact on households" and Goal 7 on "Increasing access to COVID-19 response financing".

Finally, the LDCF project is aligned with the prioritized sectors and adaptation technologies highlighted in Myanmar's **Technology Needs Assessment (TNA) (2020)**. The TNA highlighted the following priority technologies in the agriculture and water sectors.

Agriculture:

- Priority 1: Solar powered drip irrigation technologies in cash crop production and plantation
- Priority 2: Conservation Agriculture (CA) technology for sustainable agriculture lands in Myanmar
- Priority 3: Improvement of salinity tolerant rice varieties in coastal and inland salinity areas

Water Resource Management:

- Priority 1: Renovation and improvement in village ponds and tube wells for better livelihoods in the Dry Zone
- Priority 2: Technology for flood disaster risk reduction in Ayeyarwady delta of Myanmar
- Priority 3: Water purifying technology in remote villages of Myanmar

The table below shows the relevant themes, interventions and indicators of the Myanmar Rice Sector Development Strategy (MRSDS), the Myanmar CSA Strategy and the AAPDRR, to which the RiceAdapt project contributes to.

#	MRSDS - Key themes	MRSDS - Interventions	Myanmar CSA Strategy / AAPDRR
1	Sustainable increase in rice productivity	1.1 Accelerate expansion of irrigated rice areas, land development and levelling, improvement of services and water management by user groups.	
		1.2 Breed and promote higher-yielding and stress-tolerant rice varieties appropriate to farmer and market preferences, and suited to different rice environments.	
		1.3 Provide adequate supply of breeder and foundation seeds to support the proliferation of private suppliers of certified and good-quality rice seed.	
		1.4 Ensure supply and adoption of	New varieties and improved farming systems resilient to drought and water stress (CSA Strategy)

#	MRSDS - Key themes	MRSDS - Interventions	Myanmar CSA Strategy / AAPDRR
		<p>good-quality seeds, appropriate fertilizer formulations, pest management alternatives, and other integrated crop management practices (Good Agriculture Practice).</p>	<p>Reduced land degradation and soil erosion</p>
		<p>1.5 Strengthen delivery extension services.</p>	
<p>2</p>	<p>Increased utilization of farm mechanization</p>	<p>2.4 Implement policies that encourage the private sector to provide farmers custom service at affordable rates for operations, such as land preparation, transplanting and harvesting, threshing, drying, and storage.</p>	

#	MRSDS - Key themes	MRSDS - Interventions	Myanmar CSA Strategy / AAPDRR
3	Adaptation to, and mitigation of, the effects of climate change and capability improvement to cope with risks	3.1 Develop and promote high-yielding and stress-tolerant varieties.	
		3.2 Develop and promote climate-smart management options for stress-prone environments.	Promote and disseminate stress tolerant agricultural crop varieties, and other indigenous and innovative technologies to reduce risk to production, processing and marketing (AAPDRR) Reduced CH4 emissions
		3.3 Promote cultivation of special traditional rice varieties with natural tolerance to deep water, prolonged flooding, salinity, or drought.	
		3.4 Promote diversified farming systems.	Diversified rural income and improved household economic resilience
		3.6 Conduct awareness campaigns and education programs and strengthen weather information delivery and early warning systems.	Enhanced use of ICT tools to communicate multi hazard early warnings (EW) & agriculture specific technical guidance to local/regional levels (AAPDRR)

#	MRSDS - Key themes	MRSDS - Interventions	Myanmar CSA Strategy / AAPDRR
			Replicate climate smart agriculture practices through CBDRR approaches and capacity building and educational training of local authorities, government, organizations and local communities on agriculture related DRR, CSA and risk forecasting (AAPDRR)
		3.7 Map areas vulnerable to floods, salinity, and drought to identify and plan adaptation measures.	Increased prevention and protection against disasters
4	Efficient utilization and sustainable management of natural resources	4.3 Maximize utilization of farm wastes and locally available biomass.	
		4.4 Promote efficient nutrient management through proper application and timing of appropriately formulated fertilizers.	

#	MRSDS - Key themes	MRSDS - Interventions	Myanmar CSA Strategy / AAPDRR
		4.5 Promote integrated pest management practices and develop a framework on appropriate use of pesticides.	
5	Postharvest loss reduction and value chain improvement	5.1 Upgrade existing mills or acquire new units to bolster efficiency, lower unit costs, and improve milled rice output and packaging capacity.	
6	Improve credit schemes for farm investment	6.1 Improve current credit schemes for smallholder farmers.	Improve access to micro capital loans and establish an emergency credit system for cooperative members in vulnerable areas (AAPDRR)
7	Capacity building	7.4 Train farmers on rice and rice-based farming systems.	
		7.5 Empower women and youth in rice farming.	

#	MRSDS - Key themes	MRSDS - Interventions	Myanmar CSA Strategy / AAPDRR
8	Quality control and safety	9.2 Develop GAP to ensure quality and compliance with the certification standards in the domestic and export markets.	

[1]

https://themimu.info/sites/themimu.info/files/documents/Core_Doc_Myanmar_Sustainable_Development_Plan_2018_-_2030_Aug2018.pdf

8. Knowledge Management

Elaborate the "Knowledge Management Approach" for the project, including a budget, key deliverables and a timeline, and explain how it will contribute to the project's overall impact.

As part of Output 4.2, the project will develop a communication and knowledge management (KM) strategy for sharing lessons learned, so that they can be shared with stakeholders to ensure effective dissemination of project findings and promote the uptake of successful practices by the government and other projects. The project will also work to ensure that project outcomes influence future public and private investments in the agriculture sector by establishing methods, processes and guidance to allow for mainstreaming of climate-resilient production systems and value chains into policy planning and master planning processes.

The project will produce semi-annual, mid-term and terminal reports which will be shared with stakeholders to disseminate lessons learned. The project will also deliver knowledge products and events on its activities and results, thus showcasing and promoting the uptake of its methodology.

The climate-proofing techniques and technologies applied by the project will be documented in project reports, facilitating their take-up in similar projects. The project will also produce training materials that will incorporate climate change adaptation elements; these will be disseminated among various Myanmar

government agencies and development partners. Furthermore, the project will utilize the Climate Change Education Center as well as the CSA Centre established at YAU under the GEF-5 SLM Project for dissemination of project results and for sharing lessons learned and best practices in the rice-based farming sector identified from the project's work in the target areas, and include of mechanisms for peer-to-peer learning. This will be done in close collaboration with the ADB-financed RCDP project.

The project will use additional means of knowledge sharing to ensure wider dissemination of knowledge created by the project to various stakeholders. This includes the use of electronic and print media, TV/radio (including the Farmer Channel based at DAR/YAU), as well the use of ICT such as mobile phone applications/text and voice messaging etc. Although mobile phone/internet coverage has increased drastically over the last few years, it is recognized that many of the targeted rice-based communities lack access to internet as well as web-based approaches and smartphones. Thus, more traditional communication means/channels such as TV and radio will also be used by the project.

Finally, the project will foster international knowledge sharing, including through the Sustainable Rice Platform (SRP) and other GEF projects working on sustainable rice landscapes in the region, such as in Cambodia and Vietnam. As highlighted above, the RiceAdapt project builds on knowledge developed under previous projects, including the successive LIFT-funded projects in the Ayeyarwady Delta, the SRP pilots by the Climate Smart Rice Project in Bago and by WCS in Ayeyarwady, etc. Exchange visits will be organized to visit farmers involved in these projects, in order to exchange knowledge and learn from their experience. Outcomes and lessons learned will also be shared through events such as rice fairs, farmer-to-farmer exchange, and farmer field days. Farmer organizations such as seed grower associations, will also be engaged in knowledge exchange.

9. Monitoring and Evaluation

Describe the budgeted M and E plan

The monitoring and evaluation of progress in achieving the results and objectives of the project will be based on targets and indicators in the Project Results Framework ([Annex A1](#)). Project monitoring and evaluation activities are budgeted at USD 213,217 (see sub-section 9.4). Monitoring and evaluation activities will follow FAO and GEF policies and guidelines for monitoring and evaluation. The monitoring and evaluation system will also facilitate learning and replication of project outcomes and lessons with regard to the incorporation and consolidation of good practices in sustainable rangeland management and biodiversity conservation.

9.1 Oversight and monitoring responsibilities

The monitoring and evaluation roles and responsibilities specifically described in the Monitoring and Evaluation table will be undertaken through: (i) day-to-day monitoring and project progress supervision

missions; (ii) technical monitoring of indicators to measure a reduction in land degradation; (iii) terminal evaluation; and (v) monitoring and supervision missions.

At the beginning of the implementation of the GEF project, the PMU will establish a system to monitor the project's progress. Participatory mechanisms and methodologies to support the monitoring and evaluation of performance indicators and outputs will be developed. During the project inception workshop, the tasks of monitoring and evaluation will include: (i) presentation of the project's Results Framework with all project stakeholders; (ii) review of monitoring and evaluation indicators and their baselines; and (iii) clarification of the division of monitoring and evaluation tasks among the different stakeholders in the project. Based on the results indicator matrix developed during PPG, the National Knowledge Management and M&E Specialist will prepare a draft monitoring and evaluation matrix that will be discussed and agreed upon by relevant stakeholders during the project inception phase. The monitoring and evaluation matrix will be a management tool for the National Project Coordinator and the project partners to: i) six-monthly monitor the achievement of output indicators; ii) annually monitor the achievement of outcome indicators; iii) clearly define responsibilities and verification means; iv) select a method to process the indicators and data. As described under Output 4.3, the project will use an M&E/Knowledge Management System (KMS) system that builds on the ICRISAT MEASURE platform and will be used for project M&E and data collection. Baseline and annual M&E household surveys will be carried out to measure/assess the project's impact.

The day-to-day monitoring of the project's implementation will be the responsibility of the PMU and will be driven by the preparation and implementation of an Annual Work Plan and Budget followed up through six-monthly Project Progress Reports. The preparation of the Annual Work Plan and Budget and six-monthly PPRs will represent the product of a unified planning process between main project stakeholders. As tools for results-based-management (RBM), the Annual Work Plan and Budget will identify the actions proposed for the coming project year and provide the necessary details on output and outcome targets to be achieved, and the Project Progress Report will report on the monitoring of the implementation of actions and the achievement of output and outcome targets.

9.2 Indicators and sources of information

In order to monitor project outputs and outcomes, a set of indicators have been set forth in the Results Framework ([Annex A1](#)). The indicators and means of verification of the Results Framework will be applied to the monitoring of project performance and its impact. Following the FAO monitoring procedures and progress report formats, the data collected will have a sufficient level of detail so as to allow follow-up of specific outputs and outcomes, and early detection of project risks. Output target indicators will be monitored every six months and outcome indicators will be monitored on an annual basis, if possible, or at least during mid-term review and terminal evaluation.

The main sources of information to support the monitoring and evaluation programme will be the following: (i) participatory workshops and visits to intervention areas; (ii) project progress reports; (iii)

consulting service reports; (iv) training workshop evaluations; (v) impact assessments at mid-term review and terminal evaluation carried out by independent consultants; (vi) financial reports and budget revisions; (vii) Annual Project Implementation Reviews prepared by FAO/Lead Technical Officer, with the support of the FAO Project Task Force and the PMU; and (viii) FAO supervisory mission reports.

9.3 Reporting schedule

Specific reports that will be prepared under the monitoring and evaluation program are: (i) Project inception report; (ii) Annual Work Plan and Budget (AWPB); (iii) Project Progress Reports (PPRs); (iv) Annual Project Implementation Review (PIR); (v) Technical reports; (vi) Co-financing reports; and (vii) Terminal report.

Project Inception Report. After project approval by FAO, a project inception workshop will be held. Following the workshop, the PMU will prepare a project inception report, in consultation with the Project Task Force of the FAO Office in Myanmar and other project actors. The report will include a description of institutional functions and responsibilities, and the coordination of project actors, progress made in setting up the project and inception activities, as well as an update on any change in the external conditions that may affect the project's execution. It will also include a detailed Annual Work Plan and Budget for the first year, a detailed monitoring plan based on the monitoring and evaluation plan presented in the following section. The draft Inception Report will be sent to FAO and the PSC, for their no-objection before its finalization, within three months after project start-up. The report must be approved by the Budget Holder, Lead Technical Officer and FAO-GEF Coordination Unit that will enter the report into the Field Programme Management Information System (FPMIS).

Annual Work Plans and Budget (AWPB). The PMU will submit a draft Annual Work Plans and Budget to the PSC before January 10th every year. The Annual Work Plans and Budget should include detailed activities for implementing each project output and outcome on a monthly basis, and the dates on which output and outcome indicator milestones and goals will be achieved throughout the year. A detailed budget of the project activities throughout the year will also be included, together with all necessary monitoring and supervisory activities to be carried out during the year. The Project Task Force will send out the Annual Work Plans and Budget to the FAO multidisciplinary project team for its review and shall consolidate and send FAO's comments to the PMU that will be in charge of including the comments. The final Annual Work Plans and Budget will be forwarded to the Project Steering Committee for its approval and to FAO for the final authorization and entry by the Project Task Force into the FPMIS.

Project Progress Reports (PPRs). Every six months, and before 10 June (for the period January-June) and before 10 December (for the period July-December), the PMU shall submit Project Progress Reports to the Project Steering Committee and to the FAO Representative in Myanmar. The first semi-annual Project Progress Reports must be submitted together with an Annual Work Plans and Budget updated if necessary for FAO's review and approval. Project Progress Reports will be useful for identifying limitations, problems or bottlenecks hindering the timely implementation of project activities, and for

taking the appropriate corrective measures. Project Progress Reports will be prepared on the basis of the systematic monitoring of outcome and output indicators identified in the project Results Framework (Annex 1). Every six months, the Project Task Force will examine the Project Progress Reports, gather and consolidate any comments by FAO (Lead Technical Officer, FAO-GEF Coordination Unit, and Budget Holder) and send them to the PMU. Once the comments have been duly included, the Lead Technical Officer will provide the final approval and send the final Project Progress Reports to the FAO-GEF Coordination Unit for its final approval and entry into the FPMIS.

Annual Project Implementation Review reports (PIRs). The PMU (in collaboration with the BH and the LTO) will prepare an annual PIR covering the period July (the previous year) through June (current year) to be submitted to the FAO GEF Coordination Unit Funding Liaison Officer (FLO) for review and approval no later than (check each year with GEF Unit but roughly end June/early July each year). The FAO-GEF Coordination Unit will enter the Annual Project Implementation Review Report into the Field Programme Management Information System, and will send it to the GEF Secretariat and Evaluation Office as part of the annual follow-up review of the FAO-GEF portfolio. Likewise, the Annual Project Implementation Review Report must be sent to the GEF Focal Point within the Government of Myanmar. The FAO-GEF Coordination Unit will provide the Lead Technical Officer with the updated Project Implementation Review Report format when required. The Project Implementation Review Report will be uploaded to FPMIS by the FAO-GEF Coordination Unit.

Technical reports. The technical reports will be one of the project's outputs and will document and disseminate lessons learnt. Draft technical reports shall be submitted by the PMU to the FAO Representative's Office in Myanmar that will share them with the Lead Technical Officer for their review and approval, and with the FAO-GEF Coordination Unit for its information and comments, before they are published. Copies of the technical reports will be sent to the Project Steering Committee and other project actors, as appropriate. The Project Task Force will post these reports on FAO's FPMIS.

Co-financing Reports. The National Project Coordinator will be in charge of gathering the necessary information on co-financing in kind and in cash, provided by all project co-financers; those included in this project document as well as unforeseen future co-financing. Every year, the PMU will submit these reports to the FAO Representative's Office in Myanmar before July 10th, covering the period of July of the previous year thru June of the year the report is issued.

Terminal Report. Within a term of six months before project completion, the PMU will submit to the Project Steering Committee and to the FAO Representative's Office in Myanmar, a draft Terminal Report. The main purpose of the Terminal Report is to offer guidance to the Minister or high officials on the necessary policy decisions needed for project follow-up, and submit to the donor, information on the use of funds. Therefore, the Terminal Report will consist of a brief summary of the main project outputs, outcomes, conclusions and recommendations, without unnecessary background information, descriptions or technical details. The report will be addressed to people who are not necessarily technical experts and who must understand the policy implications of the technical conclusions and needs, to ensure the

sustainability of project outcomes. The Terminal Report will assess activities, summarize lessons learned and set forth recommendations in terms of their application. A project evaluation meeting must be held to discuss the draft Terminal Report with the PSC before its finalization by the PMU, and its approval by the Budget Holder, the Lead Technical Officer and the FAO-GEF Coordination Unit.

9.4 Monitoring and Evaluation summary

The following table summarizes the main monitoring and evaluation reports, parties responsible for their publication and time frames.

M&E Activity	Responsible Parties	Timeframe	GEF Budget (USD)
Inception workshop	PMU, Lead Technical Officer, and FAO-GEF Coordination Unit	Within two months of project start up	7,000
Annual national PSC meetings and stakeholder consultation workshops	PMU, FAO	Annually	25,000
Community-based planning, monitoring and evaluation meetings	National Project Coordinator; National Safeguards and Gender Specialist, project partners, local organizations	Continuous	No extra costs, budgeted under Outputs
Development of M&E/ KMS system (Output 4.3)	PMU	Year 1	Budgeted under Output 4.3
Project Progress Reports (PPRs)	PMU	No later than one month after each biannual reporting period (Jan-Jun and Jul-Dec)	74,667 KM and M&E Specialist
Project Implementation Review (PIR)	FAO, in its role as implementation agency	1 August of each reporting year	KM and M&E Specialist listed above
Financial reports	Finance Officer	Quarterly	No extra costs
Co-financing reports	PMU, FAO	Annually	No extra costs

M&E Activity	Responsible Parties	Timeframe	GEF Budget (USD)
Technical reports	PMU (staff or letters of agreement); reviewed by Lead Technical Officer	As needed	KM and M&E Specialist listed above
Mid-term review	PMU, FAO	During the 2 nd year of the project	50,000
Terminal evaluation (including terminal report)	External consultant, FAO Independent PMU, FAO Office of Evaluation	To be launched within six months prior to the actual project completion date	56,550
Total Budget			USD 213,217

9.5 Evaluation Provisions

At the end of the first 24 months, the project will undergo an independent Mid-Term Review headed by the FAO Evaluation Office. The purpose of the Mid-Term Review is to review project implementation progress and effectiveness in terms of achievement of objectives, outcomes and outputs. The conclusions and recommendations will be crucial for improving the overall design of the project and its implementation strategy, if necessary, during the remaining period of project execution. FAO will put in place the necessary arrangements for the Mid-Term Review, in consultation with the executing partner.

The Mid-Term Review will include, the following elements:

- a) An analysis of the effectiveness, efficiency and compliance with the time-frame established for the project's implementation;
- b) An analysis of the project management structure's effectiveness and efficiency;
- c) An analysis of the effectiveness of the collaboration mechanisms between the parties;
- d) Identification of the aspects requiring corrective actions and decisions;
- e) A proposal for mid-term corrections and/or adjustments to the implementation strategy, as necessary;
- f) A description of technical achievements and lessons learned from project design, implementation and management.

The GEF evaluation policy foresees that all medium and large size projects require a separate terminal evaluation. Such evaluation provides: i) accountability on results, processes, and performance; ii) recommendations to improve the sustainability of the results achieved and iii) lessons learned as an evidence-base for decision-making to be shared with all stakeholders (government, execution agency, other national partners, the GEF and FAO) to improve the performance of future projects.

The Budget Holder will be responsible to contact the Regional Evaluation Specialist (RES) six months prior to the actual completion date (NTE date). The RES will manage the decentralized independent terminal evaluation of this project under the guidance and support of OED and will be responsible for quality assurance. Independent external evaluators will conduct the terminal evaluation of the project taking into account the "GEF Guidelines for GEF Agencies in Conducting Terminal Evaluation for Full-sized Projects". FAO Office of Evaluation (OED) will provide technical assistance throughout the evaluation process, via the OED Decentralized Evaluation Support team. In particular, it will also give quality assurance feedback on: selection of the external evaluators, Terms of Reference of the evaluation, draft and final report. OED will be responsible for the quality assessment of the terminal evaluation report, including the GEF ratings.

After the completion of the terminal evaluation, the BH will be responsible to prepare the management response to the evaluation within four weeks and share it with national partners, GEF OFP, OED and the FAO-GEF Coordination Unit.

9.6 Disclosure

The project will ensure transparency in the preparation, conduct, reporting and evaluation of its activities. This includes full disclosure of all non-confidential information, and consultation with major groups and representatives of local communities. The disclosure of information shall be ensured through posting on websites and dissemination of findings through knowledge products and events. Project reports will be broadly and freely shared, and findings and lessons learned made available.

10. Benefits

Describe the socioeconomic benefits to be delivered by the project at the national and local levels, as appropriate. How do these benefits translate in supporting the achievement of global environment benefits (GEF Trust Fund) or adaptation benefits (LDCE/SCCF)?

The project will generate socio-economic benefits for an estimated 90,000 people (women and men, with a target of 50% women) in the target townships by increasing the resilience and reduce the vulnerability of Myanmar's rice-farming communities and delta ecosystems to the adverse impacts of climate change.

The project will support farmers and landless people in the target townships, including women and ethnic minorities, to enhance productivity and generate income from improved value chains. Furthermore, it will assist them in diversifying their livelihoods in the agriculture sector to increase resilience in the face of future shocks. Socio-economic benefits will also be generated by promoting the use of contract farming and associated Participatory Guarantee Systems (PGS). Through advanced levels of compliance with SRP Standard requirements, farmers can claim to produce *SRP Verified* rice which will facilitate access to novel markets, both domestic and export, for premium quality rice. The project will seek to improve a number of enabling conditions for climate change adaptation in the rice sector and in agriculture more generally,

including through improved access to credit and quality inputs such as seeds, promotion of nature-based solutions, and national and sub-national capacities in weather forecasting, agromet services and early warning systems, as well as through diversification strategies.

As part of Output 2.4, the project will support alternative income sources through diversified farming system development, including promotion of dry season crops, crop rotation/intercropping, livestock raising, small-scale aquaculture ponds and rice-fish farming, vegetable gardening, etc. These efforts aim to enhance resilience as well as food security and nutrition and increase household incomes, in particular for landless and female-headed households. As noted in Annex A1 (Results Framework), the increase in income and yield will be monitored through the project's M&E system. The target in increase in income is at least 10% above baseline, for an estimated 22,500 beneficiaries (50% women).

Under Component 3, at least 12 women and youth enterprises will be established or strengthened. Additional targets to ensure socio-economic benefits for women and strengthen women's participation and empowerment are included in the Gender Analysis and Action Plan in [Annex O](#).

By strengthening the capacity of national institutions to integrate climate change adaptation into their programming, the project will also ultimately aim to create socio-economic benefits beyond the target regions.

Finally, through these interventions, the project also works towards achieving full and productive employment and decent work in rural areas, including women and men.^[1]

[1] See also <http://www.fao.org/rural-employment/en/>.

11. Environmental and Social Safeguard (ESS) Risks

Provide information on the identified environmental and social risks and potential impacts associated with the project/program based on your organization's ESS systems and procedures

Overall Project/Program Risk Classification *

**CEO
Endorsement/Approval**

PIF **MTR** **TE**

Medium/Moderate

Measures to address identified risks and impacts

Elaborate on the types and risk classifications/ratings of any identified environmental and social risks and impacts (considering the GEF ESS Minimum Standards) and any measures undertaken as well as planned management measures to address these risks during implementation.

A summary of the environmental and social risk identified, associated impacts and mitigation measures to address during project implementation, is provided below.

Social & Environmental Risks and Impacts	Mitigation measures	Responsible party	Cost	Timeline
ESS 1: Natural Resource Management				

<p>1) The project may aim at improving an irrigation scheme (without expansion).</p>	<p>The project will not develop any new irrigation systems, but may involve improvement or rehabilitation of existing irrigation schemes/drainage canals or other water infrastructure. This will be determined during the community-based vulnerability assessment and planning process. It is likely, though, that most of these interventions will be implemented through co-financing, i.e. not directly from the GEF funds.</p> <p>In case GEF funding is used for improving an existing irrigation scheme, the ICID-checklist[1] will be followed, and appropriate actions will be taken to identify and mitigate potential negative impacts. A budget provision for such assessments and mitigation actions has been included under the water management activities.</p> <p>Additionally, according to FAO's Environmental and Social Management Guidelines, projects aiming at improving water use efficiency will carry out thorough water accounting in order to avoid possible negative impacts such as waterlogging, salinity or reduction of water availability downstream. Water management and efficiency under the RiceAdapt project will be addressed as part of the SRP Standard (Performance Indicator 4 on Water productivity and quality). Water accounting may be implemented building on recent capacity development activities organized by FAO and partners in Myanmar (see <i>Section 2) Baseline scenario</i>).</p>	<p>PMU</p>	<p>USD 20,000</p>	<p><i>Year 2-4</i></p>
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ESS 2: Biodiversity, Ecosystems and Natural Habitats

<p>2) The project interventions may lead to changes in farming practices that potentially pose risks to ecosystem sustainability, biodiversity, and may lead to alteration of current landscapes.</p> <p><i>(Note: This risk was identified based on US comment during GEF Council review.)</i></p>	<p>The project interventions are based on the principles of agroecology and nature-based solutions (NBS) and aligned with the SRP Standard. The SRP Standard includes a specific requirement dealing with land conversion and biodiversity under the 'Pre-Planting' theme aimed avoiding land conversion to rice production in protected areas. Thus, in principle, the impacts to natural ecosystems and biodiversity are expected to be positive. Nevertheless, some unintended negative impacts may occur, such as the expansion of agriculture after successful increase in yields/incomes. It has also been highlighted in the stakeholder consultations that the development of salt-tolerant varieties may potentially lead to further conversion of mangrove areas into rice paddies.</p> <p>To address this risk, as part of the local planning process, awareness will be raised on the importance of ecosystem integrity and of conserving natural ecosystems in the landscape. Local awareness will be further developed when planning and implementing NBS in the landscape. The project will support the continuation of the ongoing policy work to support protection/reduce conversion of mangrove forests. Moreover, as explained elsewhere, it is not anticipated that there will be significant pressures from population increase in the target regions.</p> <p>The project will continuously monitor this risk and implement any mitigation measures in collaboration with local stakeholders, where required.</p>	<p>PMU</p>	<p>No extra cost</p>	<p><i>Periodic monitoring (twice a year)</i></p>
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ESS 3: Plant Genetic Resources for Food and Agriculture

<p>3) The project will provide seeds/planting material for cultivation.</p>	<p>The project will use the local seed supply systems and will work closely with DOA and DAR to enhance local capacity for quality seed production. In all cases of seed procurement appropriate technical clearances will be sought. For hybrid rice in particular, clearance will be sought of relevant technical experts at FAO's Regional Office for Asia and the Pacific (RAP) and/or HQ Technical Officers, in order to ensure that their use is technically, environmentally and socially sound.</p> <p>For the quality seed/pure seed production, the project will collaborate with Myaungmya Seed farm and DAR in Nay Pyi Taw to get the Registered Seeds (RS) for seed growers. Farmers grow and produce the Certified Seeds (CS), which they distribute/sell to the rice farmers. Seed producers must follow the methods set by Seed division (timely rouging^[2], row spacing, etc.). DOA extension workers or staff from the Seed Division provide trainings to the seed growers. Experts from the Seed Division conduct field inspections at least once during the crop season; the seed samples (CS) harvested are sent to the Seed Laboratory to get the certification for pure seed production. The project will support these processes.</p> <p>For growing of improved salinity tolerant rice varieties, the project will use improved salt tolerant varieties produced from DAR, Nay Pyi Taw or Myaungmya Seed farm. This is mainly relevant for Wakema and Kawa/Thanatpin/Waw townships, as Maubin and Kyaiklat do not have serious salt-affected areas.</p>	<p>PMU, FAO</p>	<p>No extra cost (budgeted through project activities)</p>	<p><i>Ongoing</i></p>
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4) The project may involve the importing or transfer of seeds and/or planting materials for research and development	The project will support DAR in conducting trials of rice varieties with tolerance to climatic and biotic stresses. This will be done in close collaboration with and under the supervision of IRRI, and will duly respect any international agreements with regard to sharing of genetic resources, including the International Treaty on Plant Genetic Resources for Food and Agriculture and the Nagoya Protocol of the Convention on Biodiversity. Where relevant, Standard Material Transfer Agreements (SMTAs) will be signed as per standard IRRI practice.	PMU, IRRI, DAR	No extra cost	<i>Throughout project implementation</i>
ESS 4: Animal - Livestock and Aquatic - Genetic Resources for Food and Agriculture				
n/a				
ESS 5: Pest And Pesticide Management				

<p>5) The project may procure, supply and/or result in the use of pesticides on crops, livestock, aquaculture or forestry.</p>	<p>While project funds will not be used to procure pesticides, the project will assist farmers in enhancing their pest management practices. This will largely consist in alternative and integrated pest control measures in line with FAO's good IPM advice and guided by the principles of agroecology and NBS. The project will support capacity building for pesticide risk reduction, including for enhanced application of chemical pesticides, <i>as a last resort</i> where/whenever relevant. The project will also support capacity building for compliance with IPM requirements in the SRP Standard. This also includes good measures for reducing health and safety risks associated with use, storage and disposal of pesticides and empty containers.</p> <p>An Integrated Pest Management Plan (IPMP) has been developed by the project and its implementation will be an integral part of the Climate Farmer Field Schools and other interventions supported by the project.</p>	<p>PMU</p>	<p>USD 102,000 for IPMP, USD 60,000 for Agro-ecology and FFS Expert</p>	<p><i>Throughout project implementation</i></p>
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<p>6) The project may provide seeds or other materials treated with pesticides (in the field and/or in storage).</p>	<p>The project may involve handling of seeds treated with pesticides. However, use of pesticide-coated seeds in rice production is not common in Myanmar and also not recommended given potential food safety and environmental impacts. As mentioned above, an Integrated Pest Management Plan (IPMP) has been developed by the project and its implementation will be an integral part of the Climate Farmer Field Schools.</p> <p>In any case, the use of chemical pesticides for seed treatment or storage of harvested produce is subject to an internal clearance procedure.[3]</p>	<p>PMU</p>	<p>No extra cost</p>	<p><i>Throughout project implementation</i></p>
<p>ESS 6: Involuntary Resettlement and Displacement</p>				
<p>n/a</p>				
<p>ESS 7: Decent Work</p>				

7) The project involves sub-contracting.	<p>The project will have an Operational Partners Agreement with the Government or another designated partner, and will have several LOAs with NGOs for local implementation. FAO procedures will be followed.</p> <p>The project will ensure that contractors fulfil the standards of performance and quality, taking into account national and international social and labour standards. Also, activities implemented under contracts will promote local entrepreneurs ? particularly rural women and youth ? to maximize employment creation under decent working conditions. This has been incorporated as integral part of the project design. Additionally, the project is committed to assist value chain stakeholders to comply with the SRP Standard and its Social/Labor requirements.</p>	FAO	No extra cost	<i>Throughout project implementation</i>
ESS 8: Gender Equality				
n/a				
ESS 9: Indigenous Peoples and Cultural Heritage				
8) Ethnic minorities live outside (in proximity of) the project area where activities will take place.	<p>In the Sittaung areas, specifically in Bago Region, there are large Kayin (Karen) populations. However, based on the detailed project design elaborated during PPG, it is unlikely that project activities would affect communities outside the project area.</p> <p>This will be monitored during project implementation.</p>	PMU	No extra cost	<i>Periodic monitoring (twice a year)</i>

<p>9) Ethnic minorities live in the project area where activities will take place.</p>	<p>The areas targeted by the project comprise of at least seven ethnic groups, with Bamar and Kayin being the majority. The majority of the people in targeted areas are Buddhist, with small minorities of Christians, Muslims and Hindu. A Free, Prior and Informed Consent (FPIC) process has been initiated during PPG and will be continued during implementation, as per the project's FPIC plan (Annex J). The defined FPIC process ensures that all ethnic groups within the project sites are consulted, participate in and equally benefit from the project interventions. The project also utilizes Conflict Sensitive Principles in its design and implementation, following guidance by LIFT's Conflict-Sensitive Programming (see above).</p> <p>The ethnic minorities in the target areas live in mixed communities with the majority Bamar and represent a small percentage of the project's beneficiaries. An Indigenous Peoples' Plan is, therefore, not required.</p> <p>No negative impacts on ethnic minorities are expected by the project.</p>	<p>PMU</p>	<p>USD 96,000 for Safeguards and Gender Specialist, meeting costs covered through other budget lines</p>	<p><i>Throughout project implementation</i></p>
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<p>10) The project is located in an area where cultural resources exist.</p>	<p>A socio-economic analysis was conducted during PPG and consultations were held with local communities, in particular ethnic minorities, to identify cultural resources. Tangible cultural heritage identified include pagodas, temples, mosques and other religious buildings. In terms of intangible cultural heritage, the stakeholders primarily identified various religious and cultural festivals. It is not anticipated that the project will have any negative impacts on tangible or intangible cultural heritage.</p> <p>ESS9 on indigenous peoples and cultural rights will be followed.</p>	<p>PMU</p>	<p>No extra cost</p>	<p><i>Periodic monitoring (twice a year)</i></p>
<p>Other social and environmental risks as identified in the Socio-economic analysis</p>				
<p>11) Women may be discriminated against in terms of employment opportunities, salary, and contracting of labour with respect to gender and physical strength</p>	<p>Non-discrimination and fair treatment policy will be applied in the project for all beneficiaries. Partners, subcontractors and workers will be informed and made aware of that policy.</p>	<p>PMU</p>	<p>No extra cost</p>	<p><i>Periodic monitoring (twice a year)</i></p>
<p>12) Certain agroecological/ NBS management practices, if not chosen/promoted wisely, could increase the need for labour inputs and drudgery, for women in particular.</p>	<p>The need for labour inputs and drudgery will be taken into consideration when selection/promoting adaptation options. Priorities of women will also be taken into account when prioritizing adaptation measures.</p>	<p>PMU</p>	<p>No extra cost</p>	<p><i>Periodic monitoring (twice a year)</i></p>

<p>13) Health and safety impacts to construction workers and to nearby communities in case of rehabilitation of irrigation or drainage infrastructure.</p>	<p>Any contractors will be required to follow the highest health and safety standards, such as:</p> <ul style="list-style-type: none"> - Watering of the site, access roads for dust suppression - Restricted working hours - Systematic waste disposal - Provide Personal Protective Equipment (PPE) to the workers - Covering transport trucks with covers - Providing safety working guidelines - Providing first aid kits - Preparation of Emergency Preparedness Plans (incorporate relevant clauses/Code of Practice into contracts) - Recruitment of workers should require proof of age to avoid employing those under age of 18 - General awareness raising of health and safety risks of child labour in line with FAO Framework^[4] and SRP Performance Indicator 11 	<p>PMU</p>	<p>No extra cost</p>	<p><i>Periodic monitoring (twice a year)</i></p>
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<p>14) Potential risk of access restrictions if storage facilities are developed on farmers' land without their consent.</p>	<p>The project will not implement any storage facilities on farmers' or communities' land without their consent. In addition, these land areas will be relatively small. In case of voluntary agreement by a farmer or community to build storage facilities on their land, the project will ensure that any land owners and customary users, in particular vulnerable groups, benefit from the facilities in a fair and clearly agreed way. Consultations and agreement with the affected persons will be required if such land requirement is unavoidable.</p> <p>Places in close proximity of cultural heritage buildings will be avoided.</p>	<p>PMU</p>	<p>No extra cost</p>	<p><i>Periodic monitoring (twice a year)</i></p>
<p>15) Farmers under contract farming may face losses if there is no fair agreement on the volume to be purchased, the quality standard, the negotiations how to pay back the advanced money taken for cultivating the crops, in particular in case of adverse weather events.</p>	<p>Terms and conditions to be followed by the private sector millers and the farmers required to be set out clearly and discussed well and make agreement since before the implementation starts. Best practices from recent implementation of contract farming in the project area will be taken into account.</p>	<p>PMU</p>	<p>No extra costs</p>	<p><i>Periodic monitoring (twice a year)</i></p>

[1] https://www.icid.org/res_drg_envimp.html

[2] Selective removal of undesirable plants from a seed crop.

[3]

http://www.fao.org/fileadmin/templates/agphome/documents/Pests_Pesticides/Code/E_SS5_pesticide_checklist.pdf

[4] FAO (2020). FAO Framework on Ending Child Labour in Agriculture.

<http://www.fao.org/3/ca9502en/CA9502EN.pdf>

Supporting Documents

Upload available ESS supporting documents.

Title	Module	Submitted
Section B ESS Risks	CEO Endorsement ESS	
Annex P Rice-Adapt IPM report	CEO Endorsement ESS	
Annex J RiceAdapt Report on Ethnic Minorities and FPIC	CEO Endorsement ESS	

ANNEX A: PROJECT RESULTS FRAMEWORK (either copy and paste here the framework from the Agency document, or provide reference to the page in the project document where the framework could be found).

<p>Development Objective: 90,000 women and men with increased resilience and adaptive capacity; 57,000 ha of agricultural landscapes under climate-resilient management; ecosystem services are maintained or enhanced.</p> <p>Project Objective: To enhance the resilience and adaptive capacities of vulnerable rice-producing communities in the Ayeyarwady Delta and Bago-Sittaung River Basin in Myanmar through an ecosystem based and market driven approach.</p>
<p>Responsible for data collection: Knowledge Management and M&E Specialist, in close collaboration with the PMU staff, MOALI (in particular, DOP and DOA) and MONREC.</p>

Results chain	Indicators	Baseline	Mid-term target	Final target	Means of verification	Assumptions	Links with LDCF indicators
Objective-level indicators/Adaptation benefits							
LDCF Core Indicator 1	<p>1) Total no. of direct beneficiaries (disaggregated by sex m/f)</p> <p>Composed of:</p> <p>a) No. of direct beneficiaries from the new/improved climate information systems (m/f) >> See Outcome Indicator 2.d) below. Target: 67,470 (50% women) (90,000 minus the 22,530 below to avoid double-counting)</p> <p>b) No. of direct beneficiaries from more resilient physical and natural assets (m/f) >> Expected to mostly overlap with a) and c), thus no separate indicator</p> <p>c) No. of direct beneficiaries with diversified and strengthened livelihoods and sources of income (m/f) >> See Outcome Indicator 2.e) below. Target: 22,500 (50% women)</p> <p>d) No. of entrepreneurs supported (m/f) >> See Outcome Indicator 3.a) and b) below. Target: 18 + 12 = 30 (50% women)</p> <p>Grand total beneficiaries: 90,000 (50% women)</p> <p style="color: green;">Note: Need to avoid double-counting between the sub-categories.</p>						

Results chain	Indicators	Baseline	Mid-term target	Final target	Means of verification	Assumptions	Links with LDCF indicators
LDCF Core Indicator 2	2) Area of land managed for climate resilience (ha) Composed of: a) ha of agricultural land managed for climate resilience >> See Outcome Indicator 2.g) below. Target: 9,000 ha b) ha of rural landscape managed for climate resilience >> See Outcome Indicator 2.h) below. Target: 48,000 ha <i>Avoid double-counting.</i>						
LDCF Core Indicator 3	3) Total no. of policies/ plans that will mainstream climate resilience Composed of: a) No. of policies/plans that will mainstream climate resilience (of which national/ subnational) >> See Outcome indicator 1.d) below. Target: 7						
LDCF Core Indicator 4	4) Total no. of people trained (m/f) Composed of: a) No. of people trained (m/f)[1] >> See Outcome indicators 1.b), 2.a), 2.c) below. Target: 150 + 120 + 4,500 = 4,770 (40% women) <i>Avoid double-counting.</i>						
Component 1: Enhancing the enabling environment for climate change adaptation mainstreaming in the agriculture sector through integrated policies and planning							

Results chain	Indicators	Baseline	Mid-term target	Final target	Means of verification	Assumptions	Links with LDCF indicators
<p>Outcome 1:</p> <p>Strengthened policy and planning frameworks for climate change adaptation and governance at national and/or subnational/ local level</p>	<p>a) # of national and/or subnational cross-sectoral coordination mechanisms in place</p>	<p>Some cross-sectoral collaboration under existing government plans and UNFCCC reporting, but no formal coordination mechanism for adaptation in the agriculture sector.</p>	<p>At least 1</p>	<p>At least 1 (depending on the outcomes of the consultations)</p>	<p>Project implementation review (PIR) reports and reports of meetings</p> <p>M&E survey</p>		<p>- No. of institutional partnerships established or strengthened (LDCF Output 2.1.2)</p>
	<p>b) Climate Change Education [and Policy] Center established and operationalized</p>	<p>No cross-sectoral CC education centre in place (only sectoral centres such as the CSA Centre at YAU, DRD training unit, regional agricultural and DRD training centres)</p>	<p>Center is established</p>	<p>Center is operational and providing training to a range of stakeholders from different sectors</p>	<p>Project reports on the implementation of the Center</p>	<p>There are sufficient human and financial resources and continued commitment in MONRE C to continue operation of the Center after the project ends.</p>	

Results chain	Indicators	Baseline	Mid-term target	Final target	Means of verification	Assumptions	Links with LDCF indicators
	<p>c) # of agency staff and other stakeholders trained on climate change adaptation planning and implementation, including on producing and using climate data and information for agricultural decision making (m/f)</p> <p>(through the Climate Change Education Center)</p>	0	75 (at least 40% women)	150 (at least 40% women)	Capacity building/ training reports	<p>Government will assign qualified/ dedicated staff to be trained by the project.</p> <p>Trainees are able to apply knowledge gained as part of project activities or other duties.</p>	<p>- No. of people trained (m/f) (LDCF Output 2.3.1)</p> <p>Total no. of people trained (m/f) (Core Indicator 4)</p>

Results chain	Indicators	Baseline	Mid-term target	Final target	Means of verification	Assumptions	Links with LDCF indicators
	d) Climate change adaptation or related resilience-building measures[2] mainstreamed into # of policies, plans or development frameworks	0	3 at region/township level	1 national and 6 region/township level	Evidence of policies/plans/strategies	Policies/plans can be endorsed within the project period.	<p>- No. of policies/plans that will mainstream climate resilience (of which national/subnational) (LDCF Output 2.1.1)</p> <p>Total no. of policies/plans that will mainstream climate resilience (Core Indicator 3)</p>
Component 2: Promoting resilience and adaptation in rice-based farming systems, communities and landscapes							

Results chain	Indicators	Baseline	Mid-term target	Final target	Means of verification	Assumptions	Links with LDCF indicators
<p>Outcome 2:</p> <p>Increased resilience and adaptation of rice-based farming systems, communities and landscapes</p>	<p>a) # of local public and private institutions staff trained on facilitating local adaptation planning and implementation, including provision of agromet services/agro-climatic information (m/f)</p>	0	<p>64 (at least 40% women)</p> <p>across the 6 townships</p> <p>Of which estimated:</p> <p>? 36 local administrators</p> <p>? 6 extension officers</p> <p>? 2 private extension workers</p> <p>? 6 lead farmers in agricultural cooperatives</p> <p>? 2 SME (or MSME) representatives</p> <p>? 6 NGO representatives</p> <p>? 6 students</p>	<p>120 (at least 40% women)</p> <p>across the 6 townships</p> <p>Of which estimated:</p> <p>? 66 local administrators</p> <p>? 12 extension officers[3]</p> <p>? 6 private extension workers</p> <p>? 12 lead farmers in agricultural cooperatives</p> <p>? 6 SME (or MSME) representatives</p> <p>? 6 NGO representatives</p> <p>? 12 students</p>	Training reports	Trainees are able to apply knowledge gained/skills acquired as part of project activities or other duties.	<p>- No. of people trained (m/f) (LDCF Output 2.3.1)</p> <p>Total no. of people trained (m/f) (Core Indicator 4)</p>

Results chain	Indicators	Baseline	Mid-term target	Final target	Means of verification	Assumptions	Links with LDCF indicators
	<p>b) # of participatory climate risk and vulnerability assessments conducted, with adaptation measures prioritized</p> <p>? Of which measures that are a priority to women.</p>	<p>0</p> <p>No RVAs conducted in the target townships.</p>	<p>12 (2 per township)</p> <p>? At least 50% of adaptation measures are a priority to women.</p>	<p>24 (4 per township)</p> <p>? At least 50% of adaptation measures are a priority to women.</p>	RVA reports with prioritized adaptation measures	Simplified, community-based rapid assessments can be conducted in a relatively short period of time.	- No. of climate risk and vulnerability assessments conducted (LDCF Output 2.1.4)

Results chain	Indicators	Baseline	Mid-term target	Final target	Means of verification	Assumptions	Links with LDCF indicators
	<p>c) # of women and men participating in Climate Farmer Field Schools and/or field demonstrations</p> <p>? Of which # of landless</p> <p>? Of which women heads of household</p> <p>? Of which # of women and men applying SRP Standard</p>	0	<p>720 (120 per township, approx. 30-40% women)</p> <p>i.e., 24 villages * 30 participants * 1 year.</p> <p>? Of which at least 72 (10%) landless</p> <p>? Of which at least 72 (10%) women heads of household</p>	<p>4,500 (750 per township, approx. 30-40% women)</p> <p>i.e., 50 villages * 30 participants * 3 years.</p> <p>? Of which at least 450 (10%) landless</p> <p>? Of which at least 450 (10%) women heads of household</p> <p>? Of which 1,890[4] can claim to work towards sustainable rice production as per required SRP Standard compliance levels (verified through SRP Assurance Level 1-2)</p> <p>? Of which 567 will be certified as <i>SRP Verified</i> sustainable rice</p>	PIR reports, M&E survey	<p>Farmers participating in CFFS will be able to apply and sustain improved practices.</p> <p>Improved practices will result in improved quality/productivity.</p> <p>Domestic and international buyers will (continue to) be interested to source <i>SRP Verified</i> rice.</p>	<p>- No. of people trained (m/f) (LDCF Output 2.3.1)</p> <p>Total no. of people trained (m/f) (Core Indicator 4)</p>

Results chain	Indicators	Baseline	Mid-term target	Final target	Means of verification	Assumptions	Links with LDCF indicators
	d) # of women and men with access to improved climate information systems[5] (such as DOA/DMH bulletins, mobile apps, radio etc.)	0 <i>Note: Population is around 1,000 per village, 2,700 per village tract.</i>	24,000 (4,000 per township, approx. 50% women) 24 villages * 1,000 people	90,000 (15,000 per township, approx. 50% women) <i>90 villages * 1,000 people</i>	PIR reports, M&E survey	As above.	- No. of direct beneficiaries from the new/improved climate information systems (m/f) (LDCF Output 1.1.3) Total no. of direct beneficiaries (m/f) (Core Indicator 1)

Results chain	Indicators	Baseline	Mid-term target	Final target	Means of verification	Assumptions	Links with LDCF indicators
	<p>e) # of women and men adopting climate-resilient/agroecological practices, including through diversification and options/livelihood improvement for landless households</p> <p>? % increase in income</p> <p>? % increase in yield</p>	<p>0</p> <p>Includes all members of household (HH)</p>	<p>7,200 (1,200 per township, approx. 50% women)</p> <p>(FFS participants * 5 HH members)</p> <p>Increase in income and yield monitored through M&E system</p>	<p>22,500 (3,750 per township, approx. 50% women)</p> <p>(FFS participants * 5 HH members)</p> <p>Increase in income and yield monitored through M&E system. Target at least 10% above baseline.</p>	PIR reports, M&E survey	As above.	<p>- No. of direct beneficiaries with diversified and strengthened livelihoods and sources of income (m/f) (LDCF Output 1.1.2)</p> <p>Total no. of direct beneficiaries (m/f) (Core Indicator 1)</p>
	f) # of new stress-tolerant varieties tested	0	5	5	PIR reports		

Results chain	Indicators	Baseline	Mid-term target	Final target	Means of verification	Assumptions	Links with LDCF indicators
	<p>g) ha of agricultural land under climate-resilient management as a result of the project (including agroecological practices)</p> <p>? Of which ha of paddy fields cultivated with stress-tolerant seed varieties</p>	<p>0</p> <p>Average of 5 acres or 2 hectares of agricultural land/HH. If 4,500 HHs = 9,000 ha.</p>	4,000	9,000	PIR reports, M&E survey	Climate-resilient varieties are available for adoption by farmers in target areas.	<p>- ha of agricultural land managed for climate resilience (LDCF Output 1.1.1)</p> <p>Area of land managed for climate resilience (ha) (Core Indicator 2)</p>

Results chain	Indicators	Baseline	Mid-term target	Final target	Means of verification	Assumptions	Links with LDCF indicators
	h) ha of rural landscape managed for climate resilience (as a result of nature-based solutions and/or improved water management implemented by the project).	0	10,000	48,000 To be reassessed after NBS analysis. Note: ? Maletto Inn KBA is 38,563 ha. Yelegale KBA is 8,284 ha. ? Kawa mangrove conservation project 2 x 10,000 acres (= 8,000 ha) ? May also count area under improved embankments/irrigation.	PIR reports, M&E survey		- ha of rural landscape managed for climate resilience (LDCF Output 1.1.1) - Types of natural ecosystem strengthened in response to climate change impacts (LDCF Output 1.1.4) Area of land managed for climate resilience (ha) (Core Indicator 2)
Component 3: Scaling up adaptation technologies and innovations in selected value chains, and improving market access							

Results chain	Indicators	Baseline	Mid-term target	Final target	Means of verification	Assumptions	Links with LDCF indicators
Outcome 3: Resilient livelihoods through innovations and improved access to technologies and markets	a) # of cooperatives, SMEs and farmer organizations/ groups trained in identified priority areas (such as quality seed production, IMS[6], SRP Assurance Scheme) ? Of which women-led or with at least 40% female members. ? Of which incubators and accelerators[7] ? # of adaptation technologies supported (linked to incubators/ accelerators)	0	6 (1 per township) ? Of which at least 2 women-led or with at least 40% female members. ? Monitored (no target) ? Monitored (no target)	18 (3 per township)[8] ? Of which at least 6 women-led or with at least 40% female members. ? Monitored (no target) ? Monitored (no target)	PIR reports, M&E survey		- No. of incubators and accelerators supported - No. of adaptation technologies supported (LDCF Output 1.2.1)
	b) # of women and youth enterprises established or strengthened ? Of which incubators and accelerators ? # of adaptation technologies supported (linked to incubators/ accelerators)	0	6 (1 per township) ? Monitored (no target) ? Monitored (no target)	12 (2 per township) ? Monitored (no target) ? Monitored (no target)	PIR reports, M&E survey		- No. of incubators and accelerators supported - No. of adaptation technologies supported (LDCF Output 1.2.1)

Results chain	Indicators	Baseline	Mid-term target	Final target	Means of verification	Assumptions	Links with LDCF indicators
	c) # of grain storage facilities and/or technologies[9] introduced/improved that are climate-resilient (for both rice and grain legumes/pulses)	0	3	Estimated 6 (1 per township), depending on prioritization during implementation	PIR reports, M&E survey		
	d) # of planting/harvesting/ processing technologies introduced/improved to enhance climate resilience (including land preparation and levelling, transplanting, weeding, harvesting, threshing, drying, milling) ? Of which particularly benefiting women (e.g., lightweight threshers)	0	2 ? 1	5 (Note: this represents the number of technologies, not machines) ? 2	PIR reports, M&E survey		
	e) # of contracts / partnerships established that improve access of small-scale producers to markets, credit, technologies, certified seeds and services	0	6 (1 per township)	12 (2 per township)	PIR reports, M&E survey		- Financial instruments or models to enhance climate resilience developed (LDCF Output 1.2.2)
Component 4: Monitoring & Evaluation, communication and knowledge transfer							

Results chain	Indicators	Baseline	Mid-term target	Final target	Means of verification	Assumptions	Links with LDCF indicators
Outcome 4: Project monitored and evaluated, lessons learnt and knowledge of adaptation innovations disseminated	a) # of people reached by awareness campaign/ knowledge products/ events[10]	-	As per communication and knowledge management strategy	As per communication and knowledge management strategy	PIR reports, M&E survey/awareness survey		- No. of people made aware of climate change impacts and appropriate adaptation responses (LDCF Output 2.3.2)
	b) # of national and international knowledge sharing events conducted	0	1	3	PIR reports		
	c) Cross-sectoral national/ subnational M&E system to monitor implementation of Rice Sector Development Strategy, CSA Strategy and related policies in place[11]	0	0	1	PIR reports	National stakeholders have the capacity to sustain and continue to develop M&E system beyond the project period.	- No. of systems and frameworks established for continuous monitoring, reporting and review of adaptation (LDCF Output 2.1.3)

[1] Of which line ministries/ community or association members/ extension service officers/ hydromet and disaster risk management authority staff/ small private business owners/ schoolchildren, university students or teachers.

[2] Such as land use/crop diversification/land tenure/cross-sectoral land use planning, as well as rice-related policies and access to credit.

[3] Note: There are about 15-24 DOA staff/extension officers at the township level. In addition, district officers may also be trained.

[4] Note: Not all beneficiaries will participate in the *season-long* CFFS. Some (in particular, the landless) will participate in tailor-made short-duration educational interventions based on FFS-based experiential learning processes, including through field demonstrations such as for livestock raising, small fish ponds, home gardening, etc. It is assumed that approximately 60% (2,700) beneficiaries will participate in a total of 90 CFFSs, of which 70% (1,890) will be able to claim to work towards sustainable rice production, of which 30% (567) will be *SRP Verified* rice producers and thus authorized to stake the claim of sustainable rice cultivation.

[5] As per LDCF Tracking Tool, 'Climate information system?', in this context, is understood broadly as tools including both hardware and software that reduce the vulnerability of people, livelihoods, physical assets and natural systems to the adverse effects of climate change.

[6] Internal Management System (IMS). In producer groups, the implementation of the SRP Standard needs to be managed by an IMS. An effective IMS needs to be in place as per SRP Assurance Scheme published rules and regulations and be aligned with IMS Standard requirements and compliance levels.

[7] 'Incubators and accelerators?' refers to entities that enhance the impact and speed up the technology innovation process by building the capacity of entrepreneurs and connecting them to markets, finance and other key innovation actors, in this context. If incubators and accelerators are supported under the project, please indicate: (i) how the incubators and accelerators foster innovation; and, (ii) their potential to enhance climate resilience.

[8] Calculated as 567 SRP verified farmers / 30 farmers per farmer group = approx. 18.

[9] Such as on-farm drying and storage system, including vacuum/hermetically sealed bags such as those introduced by IRRI.

[10] Population reached through public awareness activities is captured. These people are not necessarily included among the direct beneficiaries (Core Indicator 1) or the total number of people trained (Core Indicator 4), given that activities to promote people's awareness are not always associated with more in-depth training or measures directly seeking to reduce their vulnerability.

[11] As per LDCF Tracking Tool, systems and frameworks should have clear mandates, roles and responsibilities for monitoring, evaluation, reporting, learning and review associated with climate change adaptation and informing decision-making in climate-sensitive sectors.

ANNEX B: RESPONSES TO PROJECT REVIEWS (from GEF Secretariat and GEF Agencies, and Responses to Comments from Council at work program inclusion and the Convention Secretariat and STAP at PIF).

GEF Council comments	Response
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1) US Comments: As FAO prepares the draft final project document for CEO endorsement, we urge FAO to:

? Please consider the success and lessons learned from previous USAID programs in addressing gender barriers, such as their focus on seed production for women farmers in creating market opportunities;

? Please provide additional information that takes into account the risks to ecosystem sustainability, biodiversity, and potential changes in farming practice leading to alteration of current landscapes;

? Consider the implications of the ability of agricultural systems to mitigate GHG emissions and provide secondary income streams combined with the potential introduction of secondary farming activities (i.e., alternative livelihoods) related to potential aquaculture; and

? Consider the possibility of exporting the adaptive capacity of this project to other regions with similar linkages in the political and economic mapping of those regions.

The project preparation team has duly taken into account the comments raised by the United States. Firstly, it has analysed lessons learned and achievements of previous and ongoing USAID-funded projects, including the USAID STRIVE project implemented by IRRI, USAID SERVIR and the Fertilizer Sector Improvement (FSI) project (please refer to *Section 6.b Coordination with other relevant GEF-financed projects and other initiatives*). Building on the experience from the USAID STRIVE project[1], the RiceAdapt project aims to engage women farmers in activities such as seed production, as explained in *Section 1.a.3) Alternative Scenario*. The gender assessment conducted under the FSI project was also taken into account by the project team when elaborating the Gender Analysis and Action Plan.

The comment regarding risks to ecosystem sustainability has been included in *Section 5. Risks, Section B: Environmental and Social risks from the project*, under ESS 2: Biodiversity, Ecosystems and Natural Habitats.

The potential of the project activities to mitigate GHG emissions has been taken into consideration in the project design (such as through the inclusion of climate-smart agriculture activities that also generate GHG mitigation benefits), and will continue to be taken into account during implementation. Notably, GHG emissions will be measured under the SRP Performance Indicator 8 (methane and nitrous oxide). Under Component 3, technology innovations that integrate renewable energy/energy efficient measures, including off-grid solutions, will be sought where possible to reduce the carbon footprint of mechanization.

The potential to provide secondary income streams has also been incorporated, in particular through the element of diversification which is considered an important aspect of the project's strategy to support resilient livelihoods. As part of Output 2.4, in particular for landless and female-headed households, the project will support livestock raising, small-scale aquaculture ponds, vegetable gardening, etc. to enhance food security and nutrition and increase household incomes. Dry season crops (such as pulses/legume crops) will also

<p>2) US Comments: In addition, we expect that FAO in the development of its full proposal will:</p> <p>? Provide more information on <u>how beneficiaries, including women, have been involved</u> in the development of the project proposal and will benefit from this project;</p> <p>? <u>Engage local stakeholders, including community-based organizations</u>, environmental non-governmental organizations and the private sector in both the development and implementation of the program; and,</p> <p>? Provide more information on <u>how the implementing agency and its partners will communicate results</u>, lessons learned and best practices identified throughout the project to the various stakeholders both during and after the project.</p>	<p>Detailed stakeholder consultations were held during the project preparation phase, as described in <i>Section 2. Stakeholders</i> and <i>Annex I2: Stakeholder Engagement Matrix</i>, including with beneficiaries at the local level in the six target townships (despite the limitations of the COVID-19 restrictions). A detailed Gender Analysis was undertaken during PPG, including consultation with women at the community level (see <i>Annex O</i>).</p> <p>Community-based organizations, NGOs and the private sector were also consulted. As explained in the Stakeholder Engagement Matrix, local stakeholders will be closely engaged in the project implementation and will shape the detailed project activities, in particular through the vulnerability assessments and participatory planning implemented under Output 2.2.</p> <p>More information on the communication of project results, lessons learned and best practices has been included in <i>Section 1.a.3) Alternative Scenario</i> and <i>Section 8. Knowledge Management</i>. A detailed communication and knowledge management strategy will be elaborated and implemented as part of Output 4.2.</p>
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GEF Scientific and Technical Advisory Panel (STAP) comment	Response
<p>1) The intervention components would benefit from a <u>more formal Theory of Change exercise</u> which could test whether this proposal coupled with baseline activities are truly necessary and sufficient to achieve the objectives.</p>	<p>A detailed Theory of Change was elaborated during project design and discussed with project stakeholders; the results framework and intervention strategy were revised based on the detailed baseline analysis and consultations with stakeholders. Links with baseline projects were made clearer and are incorporated into the project design.</p>

2) STAP notes three other key issues for further consideration as the proposal is developed. First, the proposal clearly articulates future climate change and population change as key long-term drivers. However, it does not address the uncertainty in the rate with which either may unfold. Consequently there is no analysis of whether the proposed interventions will remain viable under all plausible scenarios of change; hence, whether a consideration of robust rather than optimal options would result in changing the proposal. STAP recommends that the next phase of project development considers the implications of a small number of alternative simple future scenario trajectories (e.g. low/high rates of climate change, levels of population change and demand) to develop possible adaptation pathways for local communities in a participatory fashion, and then assess current plans against these to ensure the intervention is not inadvertently encouraging maladaptation.

An analysis of climate scenarios was conducted during PPG and is included in *Section 1.a.1) Global environmental and/or adaptation problems*. Also, initial crop suitability maps have been prepared to understand future crop suitability, for rice, pulses and other crops. Under Component 1, the project will develop the capacity of national stakeholders to conduct this type of analyses more in detail. The project interventions have been, and will continue to be assessed against these scenarios, to ensure climate-proofing of interventions. As described in the CEO ER, the project will ensure that its interventions are durable and robust in the face of uncertain rates of change. Interventions will be based on 'no regrets' options, i.e. options that will be beneficial irrespective of the climate scenario. An important focus of the project will be on developing capacities among stakeholders and institutions for adaptive planning and management, and for continuous and incremental learning.

Due to outmigration trends and demographic transition, it is not anticipated that there will be significant pressures from population increase in the target regions. Nevertheless, socio-economic/demographic changes will continue to be monitored during project implementation.

3) Second, the proposal firmly asserts that it is to be participatory in nature (e.g. p.33 ?participatory approaches will be a key tool...?) yet the language of most of the text is top-down, technocratic delivery of information or options, even where there are many opportunities to use language like ?co-designed with communities?. We recommend this is addressed systemically in the next project development phase since, as p.33 rightly says, this is vital for durability.

The participatory approach has been made clearer throughout the document, in particular in *Section 1.a.3) Alternative Scenario* and in the output wording. A greater emphasis is being placed on participatory assessment and co-design of adaptation measures. As described in *Section 1.a.3) Alternative scenario* of this CEO endorsement request, the planned activities under Components 2 and 3 will be adjusted for each village based on the adaptation measures prioritized by the communities.

Also, local stakeholders (local communities, government, NGOs and private sector) were consulted in detail on the project design during PPG and their inputs have been incorporated.

Finally, Farmer Field Schools (FFS) will be used as a key capacity building tool, a fundamentally participatory and bottom-up approach.

4) Third, the huge diversity of baseline investments usefully documented here (at least \$800m in total) raises the question of why some of these at least have not already successfully scaled similar activities into the target regions for this proposal; accepting they have not, it would be good to have a very clear analysis of the lessons those other programs provide for how GEF's relatively small (\$9m) leverage in this project could really make an innovative difference in project design processes. Section 6 provides a useful indication of some possible lessons, but these need to be extracted and embedded in the basic design of the new proposal, perhaps partly by analysing them against the issues for durability raised in the STAP paper referenced above, or a similar framework.

An in-depth analysis of baseline investments and lessons learned of past investments has been conducted during PPG, and is included in *Section 1.a.2) Baseline scenario* and *Section 6.b Coordination with other relevant GEF-financed projects and other initiatives*.

As explained in these sections, there is a large number of relevant baseline initiatives and investments in the target regions, in particular the Ayeyarwady Delta. However, due to the limited number of government staff, limited resources, and the large number of villages and village tracts in each township with sometimes difficult access/long distances, only a limited number of townships, villages and village tracts (and farmers within these villages) have been reached by these initiatives. A large portion of donor funding has been focused on the coastal townships that were most affected by cyclone Nargis, such as Labutta, Bogale and Pyapon, while the RiceAdapt project will focus on townships in the mid-Delta (as well as coastal townships in Bago region). The RiceAdapt project will help to scale out successful approaches of the baseline projects, in particular LIFT-funded projects, the RCDP and the Climate Smart Rice Project.

[1] <http://news.irri.org/2016/03/women-rice-farmers-myanmars-next-seed.html>

**ANNEX C: Status of Utilization of Project Preparation Grant (PPG).
(Provide detailed funding amount of the PPG activities financing status
in the table below:**

PPG Grant Approved at PIF:			
<i>Project Preparation Activities Implemented</i>	<i>GETF/LDCF/SCCF Amount (\$)</i>		
	<i>Budgeted Amount</i>	<i>Amount Spent to date</i>	<i>Amount Committed</i>

the Project and Program Cycle Policy. Partner Agencies will be required to comply with the reflows procedures established in their respective Financial Procedures Agreement with the GEF Trustee. Agencies are welcomed to provide assumptions that explain expected financial reflow schedules.

ANNEX H: (For NGI only) Agency Capacity to generate reflows

Instructions. The GEF Agency submitting the CEO endorsement request is required to respond to any questions raised as part of the PIF review process that required clarifications on the Agency Capacity to manage reflows. This Annex seeks to demonstrate Agencies' capacity and eligibility to administer NGI resources as established in the Guidelines on the Project and Program Cycle Policy, GEF/C.52/Inf.06/Rev.01, June 9, 2017 (Annex 5).