CONCEPT NOTE FOR REGIONAL PROJECT/PROGRAMME

PART I: PROJECT/PROGRAMME INFORMATION

Title of Project/Programme:	**Strengthening Climate Resilience and food security through South-South Cooperation in adaptive rice production in Malaysia and the Philippines**
Countries:	Malaysia, The Philippines
Thematic Focal Area[1]:	Food security
Type of Implementing Entity:	Multilateral Implementing Entity
Implementing Entity:	**United Nations Industrial Development Organization (UNIDO)**
Executing Entities:	UNIDO; Malaysian Bioeconomy Development Corporation, Asian Disaster Preparedness Center (ADPC)

Amount of Financing Requested: 13,651,000 (in U.S Dollars Equivalent)

Project Formulation Grant Request: Yes ☒ No ☐

Amount of Requested financing for PFG: 130,000 (in U.S Dollars Equivalent)

Letters of Endorsement (LOE) signed for all countries: Yes ☒ No ☐

NOTE: LOEs should be signed by the Designated Authority (DA). The signatory DA must be on file with the Adaptation Fund. To find the DA currently on file check this page: https://www.adaptation-fund.org/apply-funding/designated-authorities

Stage of Submission:

☒This proposal has been submitted before, including at a different stage (pre-concept)

☐ This is the first submission ever of the proposal at any stage

In case of a resubmission, please indicate the last submission date: Click or tap to enter a date.

Please note that the Concept note proposal document should not exceed 50 pages, including annexes.

[1] Thematic areas are: Food security; Disaster risk reduction and early warning systems; Transboundary water management; Innovation in adaptation finance.

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PART I: PROJECT / PROGRAMME INFORMATION

Project Background and Context:

A. Background on Climate Vulnerability

1. The Philippines ranks 10th in the Long-Term CRI Index[2] as of 2025, mainly because of its relative number of people affected, accompanied by relative fatalities and economic losses. By contrast, Malaysia's Long-Term CRI Index rank is 116th with a score of 105.67. Although Malaysia is not a highly disaster-prone country compared to the Philippines, studies have shown that rice farmers have a limited perception of climate change and variability and they require water management innovation, moisture deficiency protection, plantation innovations, and finding varieties that are climate tolerant as well as understanding of integrated soil and pest management. The Climate Change Adaptation Framework (CCAF) for Water Sectors, 20213 acknowledges that climate change is now a fundamental threat in Malaysia. The three most significant climate-related hazards are sea level rise, flood & drought, and storm surge. The Philippines is also highly vulnerable to the impacts of climate change, including sea level rise, increased frequency of extreme weather events (typhoons and storm surges), rising temperatures, and extreme rainfall. Both Malaysia and the Philippines, key rice producers in Southeast Asia, are experiencing significant climate change impacts on their agricultural sectors. Rising temperatures and altered precipitation patterns threaten rice yields, critical for food security in both nations. These shared challenges provide a strong rationale for their selection in a project aimed at strengthening climate resilience through South-South Cooperation. Research indicates that Malaysia's rice sector is highly vulnerable to climate change. A study by Vaghefi et al. (2013)[4] used the DSSAT Crop Simulation Model to project rice yield reductions in eight granary areas of Peninsular Malaysia until 2030. The study found that rising temperatures and variations in rainfall patterns could decrease yields by 8.4% to 18.6% in the main season and 7.5% to 47.8% in the off-season across different regions. Another study by Vaghefi et al. (2015)[5] reported average yield reductions of 12% and 31.3% for the main and off-seasons, respectively, due to increased temperatures and erratic rainfall. Excessive rainfall during the main season can lead to flooding, further damaging crops, while droughts in the off-season exacerbate water scarcity. A study by Tan. Et. al. (2021)[6] evaluated the impact of climate change on rice yields in Malaysia using a panel data approach. They used data from 1987 to 2017 on eight granary areas in Peninsular Malaysia and found that climate variables significantly affect rice yield, and concluded that farm-level adaptations will be crucial, particularly for small-scale farmers in the "off-season", and to achieve long-term agricultural sustainability. Similarly, in the Philippines, rice production is affected by climate variability. A comprehensive study by Stuecker et al. (2018)[7] analyzed data from 1987 to 2016, finding that variations in soil moisture, largely driven by ENSO, account for about 10% of the variance in rice production anomalies. Rainfed upland rice systems are particularly sensitive to these changes compared to irrigated paddy systems. Moreover, rising temperatures and changes in precipitation patterns reduce crop yields, while extreme weather events such as typhoons, floods, and droughts cause significant crop losses. For instance, super typhoon Noru in 2022 reduced the country's rice production forecast by approximately 430,000 metric tons. The impacts of climate change on rice production in the Philippines have been well researched and analysis of weather and rice yield data suggest warming temperatures

[2] https://www.germanwatch.org/sites/default/files/2025-02/Climate%20Risk%20Index%202025.pdf
[3] https://www.kasa.gov.my/resources/Climate-Change-Adaptation-Framework-for-Water-Sectors.pdf
[4] Negin Vaghefi, Mad Nasir Shamsudin, Alias Radam and Khalid Abdul Rahim, 2013. Impact of Climate Change on Rice Yield in the Main Rice Growing Areas of Peninsular Malaysia. Research Journal of Environmental Sciences, 7: 59-67. DOI: 10.3923/rjes.2013.59.67
[5] Vaghefi, N., Shamsudin, M. N., Radam, A., & Rahim, K. A. (2015). Impact of climate change on food security in Malaysia: economic and policy adjustments for rice industry. *Journal of Integrative Environmental Sciences*, *13*(1), 19–35. https://doi.org/10.1080/1943815X.2015.1112292
[6] Tan, B.T.; Fam, P.S.; Firdaus, R.B.R.; Tan, M.L.; Gunaratne, M.S. *Impact of Climate Change on Rice Yield in Malaysia: A Panel Data Analysis.* Agriculture 2021, 11, 569. https://doi.org/10.3390/agriculture11060569
[7] Stuecker MF, Tigchelaar M, Kantar MB (2018) Climate variability impacts on rice production in the Philippines. PLoS ONE 13(8): e0201426. https://doi.org/10.1371/journal.pone.0201426

negatively impact rice yield with a 10% decline in yield with every 1-degree C rise over 30° C temperature[8]. Climate change induced drought especially during the El Nino years also has a compound effect[9]. The potential impact of climate change in the Malaysian context includes reduced crop yield, sea level rise, and biodiversity loss[10]. Therefore, in terms of data availability to justify impact of climate change on rice yields in both countries, comparable data exists providing a strong foundation for the project. As mentioned above, in Malaysia, studies such as those by Vaghefi et al. (2013) and Tan et al., (2021)[11] use panel data and crop simulation models to quantify yield reductions. Modelling also suggests that the occurrence of droughts and floods early in the rice-growing season could reduce yields by up to 60%[12]. In the Philippines, research by Stuecker et al. (2018) and others provides detailed analyses of climate variability's effects on rice production. These studies enable the identification of specific climate variables (e.g., temperature, precipitation) and their impacts, facilitating the design of targeted adaptation strategies. The identified and measurable impacts of climate change mentioned earlier are expected to worsen and intensify vulnerability factors contributing to food insecurity. The effects of climate change will lead to increasingly negative variability in crop yields throughout the region, causing ripple effects from the climate to the environment, productivity, and economic and social dimensions. To safeguard food systems, it is crucial to undertake significantly expanded efforts to respond to climate change immediately. Unfortunately, the lack of funding for research and development, particularly in Malaysia, hinders the enhancement of agricultural productivity (especially of rice) to build climate resilience and adaptive capacity against foreseeable climate change impacts[13]. Without adequate financial support, the ability of food systems to safeguard food security is at risk. The Philippines also recorded the greatest number of food-insecure people in Southeast Asia[14]. The impacts of climate change have exacerbated the above.

2. Rice cultivation is the primary temporary crop in the two countries in terms of land parcels, and the agriculture sector lies at the cornerstone of the economies of both countries, being the third most important economic sector after the manufacturing and service sectors. Over 50% of the 3.2 million holdings/farms in the Philippines are less than one hectare. The Philippines reported a total of 5.4 million households, with at least one member identified as a farm holder had an average earning of PhP 8,000 per month[15] which is below national poverty threshold. In Malaysia, rice is also produced in small holdings (2 hectares per family) and rice farmers make up almost 40% of the food subsector. The average monthly income from paddy cultivation is around RM 1,000 which is less than 50% of the national poverty line of RM 2,208 per month in 2020[16]. These low incomes limit farmers' access to resources, technologies, and training needed to adopt climate-resilient practices, exacerbating vulnerabilities to climate impacts like rising temperatures and erratic rainfall. Therefore, through this project it is expected to address these constraints by facilitating knowledge exchange and capacity building to enhance adaptive rice production, thereby strengthening climate resilience and food security in both countries.

3.In the Philippines, particularly in Nueva Ecija[17], the shift in planting and growing seasons has significantly impacted rice cultivation. The traditional planting calendar has been greatly impacted, with the onset of the rainy season moving from June to August. This shift has reduced water availability for early planting and increased vulnerability to stronger typhoons during harvest months, leading to substantial crop losses. Irregular weather patterns, characterized by intense heat during the summer and severe flooding in the rainy season, have further impacted the production. These changes in climate have resulted in reduced yields, increased pest prevalence, and exacerbated water scarcity, especially in areas lacking sufficient

[8] Cuaton, G.P., Delina, L.L. Two decades of rice research in Indonesia and the Philippines: A systematic review and research agenda for the social sciences. *Humanit Soc Sci Commun* **9**, 372 (2022). https://doi.org/10.1057/s41599-022-01394-z (URL: https://www.nature.com/articles/s41599-022-01394-z)
[9] (Stueckar et al., 2018). doi: 10.1371/journal.pone.0201426
[10] Rahman 2018. Climate Change Scenarios in Malaysia: Engaging The Public International Journal of Malay-Nusantara Studies 1(2) https://journal.unhas.ac.id/index.php/IJoM-NS/article/view/5518/3051
[11] Tan, B. T., Fam, P. S., Firdaus, R. B. R., Tan, M. L., & Gunaratne, M. S. (2021). Impact of Climate Change on Rice Yield in Malaysia: A Panel Data Analysis. Agriculture, 11(6), 569. https://doi.org/10.3390/agriculture11060569
[12] https://climateknowledgeportal.worldbank.org/sites/default/files/2021-08/15868-WB_Malaysia%20Country%20Profile-WEB.pdf
[13] https://www.worldbank.org/en/country/malaysia/publication/assessing-the-effectiveness-of-public-research-institutions-in-fostering-knowledge-linkages-and-transferring-technology-
[14] 2020 State of Food Security and Nutrition in the World
[15] https://psa.gov.ph/content/family-income-and-expenditure-survey-fies-0
[16] Household Income Estimates and Incidence of Poverty Report, Department of Statistics Malaysia, 2020
[17] Key findings from the Consultation workshop held in the Philippines in August 2024

irrigation. As a consequence, farmers face greater financial burdens, often resorting to high-interest loans to sustain their farming activities. Similarly, rice cultivation in Malaysia[18] has been adversely affected by shifting seasons and inconsistent weather patterns. In regions like Kedah, Palau Pinang, and Sarawak, prolonged wet conditions during harvest and droughts during planting have disrupted the cultivation cycle. The soft soil phenomenon has hindered machinery operations, causing partial harvest losses and field abandonment. Moreover, the rise in pest attacks and uncontrollable weed growth, exacerbated by hot and humid conditions, has increased production costs. Some farmers have abandoned their fields due to the escalating expenses linked to herbicides, pesticides, and machinery operations. The Malaysian government has introduced mitigation strategies, such as installing submersible pumps and promoting new rice varieties, but challenges in infrastructure and climate unpredictability continue to affect rice productivity and sustainability.

4.Both the Philippines and Malaysia are impacted by climate change but with different severity. Both countries face climate-induced hazards of flood, drought and sea-level rise. Studies have shown that Malaysia, Sabah, and Sarawak regions will experience a surface mean temperature increase of 0.14°C–0.25°C per decade. An increase in rainfall is projected and is expected to be larger in Sabah and Sarawak than in Peninsular Malaysia while the frequency and intensity of heat waves experienced in Malaysia is projected to increase significantly due to a warming climate. Malaysia will experience a decrease in monsoon precipitation in the southeast and an increase in the northwest during the southwest monsoon season[19]. Similarly, climate change impacts will be felt significantly in the Philippines, leading to increased temperatures, extreme weather events like typhoons, altered rainfall patterns leading to water scarcity and so on. The country is already frequented by more than 20 typhoons annually while there are concerns of sea level rise up to 60 cm which is three times the global average of 19 cm (National Integrated Climate Change Database, Information Exchange, and Sharing System (NICCDIES)[20]. Erratic rainfall is another area of concern driven by climate variability such as the El Niño Southern Oscillation (ENSO), leading to droughts and floods, as analysed by the Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA)[21] using the PRECIS model.

B. Historical Climate Trends

B 1. Historical Climate Trends in Malaysia

5. Through the year, Malaysia experiences hot and humid climate due to its equatorial location. However, climatic conditions vary across the country, with Peninsular Malaysia to that in the East experiencing varying climates (where maritime weather has more effect). Mountain ranges also influences local climatic conditions, that can be categorized as highlands (cooler and wetter, with high cloud cover), lowlands (temperatures between 23°C and 32°C and high humidity) and coastal (similar temperatures to lowlands, sunny and less rainfall). The country experiences two monsoon seasons, the Southwest Monsoon from April–September and the Northeast Monsoon from October–March[22]. Malaysia's mean annual temperature is 25.4°C and mean annual precipitation is 3,085.5 mm. There is relatively little seasonal variability in average monthly temperature, ranging one degree Celsius between a minimum of 24.9°C in January and maximum of 25.9°C in May (Figure 1). April, May and June are the hottest months of the year, based on the latest climatology from 1991–2020. Over the past several decades, Malaysia has experienced significant changes in its climate, characterized by increasing temperatures, variable rainfall patterns, and rising sea levels. Observations from 1951 to 2021 indicate that the country's average surface temperature has risen by approximately 0.2°C per decade, with maximum temperatures increasing by 0.3°C and minimum temperatures by 0.1°C per decade[23]. Similarly, data from 1969 to 2019 show regional variations: mean surface temperatures rose between 0.13°C and 0.24°C per decade across Peninsular Malaysia,

[18] Key findings from the Consultation workshop held in Malaysia in August 2024
[19] Projected near-term changes in monsoon precipitation over Peninsular Malaysia in the HighResMIP multi-model ensembles (2022). https://doi.org/10.1007/s00382-022-06363-5
[20] https://niccdies.climate.gov.ph/climate-change-impacts
[21] https://www.pagasa.dost.gov.ph/information/climate-change-in-the-philippines
[22] Malaysia (2015). First Biennial Update Report to the UNFCC. Ministry of Natural Resources and Environment Malaysia. URL: https://unfccc.int/sites/default/files/resource/MALBUR1.pdf
[23] Malaysia. 2024 Biennial Transparency Report (BTR). BTR1. URL: https://unfccc.int/documents/645171

Sabah, and Sarawak[24]. Rainfall trends over the same period reveal considerable variability influenced by monsoons and climatic phenomena such as El Niño and the Indian Ocean Dipole, with average annual precipitation ranging from 2,400 mm to 3,700 mm. While no strong long-term trend was detected in rainfall volume, significant year-to-year fluctuations are evident[23]. Furthermore, Malaysia's coastal zones are witnessing sea level rise at an average rate of 3.2 mm/year in Peninsular Malaysia and 2.9 mm/year in Sabah and Sarawak between 1986 and 2021[24]. These historical trends underscore the growing vulnerability of Malaysia's natural and human systems to climate change, necessitating proactive adaptation and resilience-building strategies.

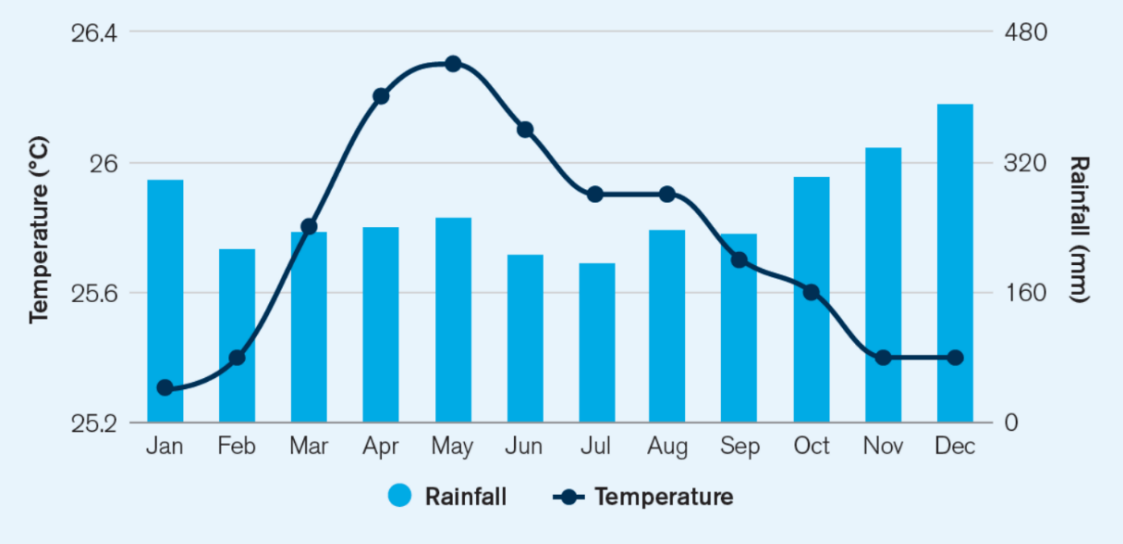

Figure 1: Average monthly temperature and rainfall in Malaysia (1991–2020)
Source: WBG Climate Change Knowledge Portal

6. The average monthly precipitation remains relatively constant throughout the year, ranging between approximately 200 mm during June and July and 350 mm in November and December. Figure 2 also shows the spatial variation of the average annual precipitation and temperature across Malaysia.

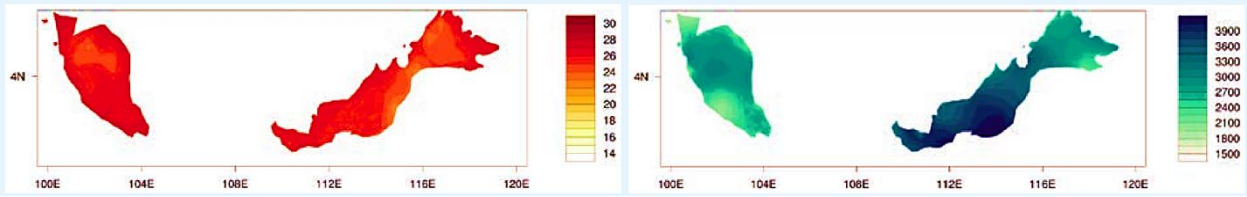

Figure 2: (Left) annual mean temperature (°C), and (right) annual mean rainfall (mm) in Malaysia over the period 1991–2020. (Source: WBG Climate Change Knowledge Portal (CCKP, 2021).

7. The variations in the interannual temperature in Malaysia is greatly influenced by El Niño-Southern Oscillation (ENSO), with ENSO periods associated with warmed weather across all of Malaysia's regions. Malaysia's Second Biennial Update Report[25] suggest that the historical trends in temperature is directly associated with climate change. Between 1970–2013, Peninsular Malaysia, Sabah and Sarawak regions experienced an increase in surface mean temperature of 0.14°C–0.25°C per decade while surface maximum temperatures increased by 0.17°C–0.22°C per decade during the same period. At the same time,

[24] https://unfccc.int/sites/default/files/resource/NRES_NC4_To%20UNFCCC_2024%20v1.0.pdf
[25] Malaysia (2018). Third National Communication and Second Biennial Update Report to the UNFCCC. URL: https://unfccc.int/sites/default/files/resource/Malaysia%20NC3%20BUR2_final%20high%20res.pdf

surface minimum temperatures increased by 0.20°C–0.32°C per decade. According to the Climate Change Knowledge Portal of the World Bank, the First Biennial Update Report published in 2016 shows the highest and lowest daily maximum temperatures from 19 meteorological stations across the Peninsular, Sabah and Sarawak regions that indicates an increase in daily maximum temperatures across the three regions and an increase in daily minimum temperatures in Peninsular Malaysia and Sarawak but a decreasing trend in Sabah. According to the Fourth National Communication (NC4), temperature anomalies in Malaysia are strongly correlated with large-scale climatic phenomena such as the El Niño–Southern Oscillation (ENSO). During El Niño years, Malaysia tends to experience higher than average temperatures, whereas La Niña years often bring cooler conditions. Historical data from 1969 to 2019 show that these variations can result in significant year-to-year fluctuations in mean, maximum, and minimum temperatures, particularly in regions such as Sabah and Sarawak[24].Similarly, the First Biennial Transparency Report (BTR1) also highlights that maximum temperatures increased at a faster rate than minimum temperatures between 1951 and 2021 by approximately 0.3°C per decade compared to 0.1°C resulting in a wider range of temperature extremes over the years[23]. These interannual variations are not uniform across the country; regional differences are apparent, with certain areas showing more pronounced fluctuations due to topography and localized climate influences.

8 Although the El Niño–Southern Oscillation (ENSO) does influence rainfall patterns in Malaysia, its effects are generally limited and vary by region. Historical records from 1951 to 2019 indicate mixed trends in annual rainfall across the country. Peninsular Malaysia and Sarawak have shown a very slight increasing trend in annual rainfall, while Sabah exhibits a slight decreasing trend. Notably, from the 1990s onward, there has been a more consistent increase in rainfall across all three regions. A study by Mayowa et al. (2015), which analysed rainfall data from 54 stations along the east coast of Peninsular Malaysia between 1970 and 2010, reported a significant upward trend in annual rainfall, especially during the monsoon season, along with an increase in the frequency of heavy rainfall days (defined as days with more than 20 mm of precipitation)[24].

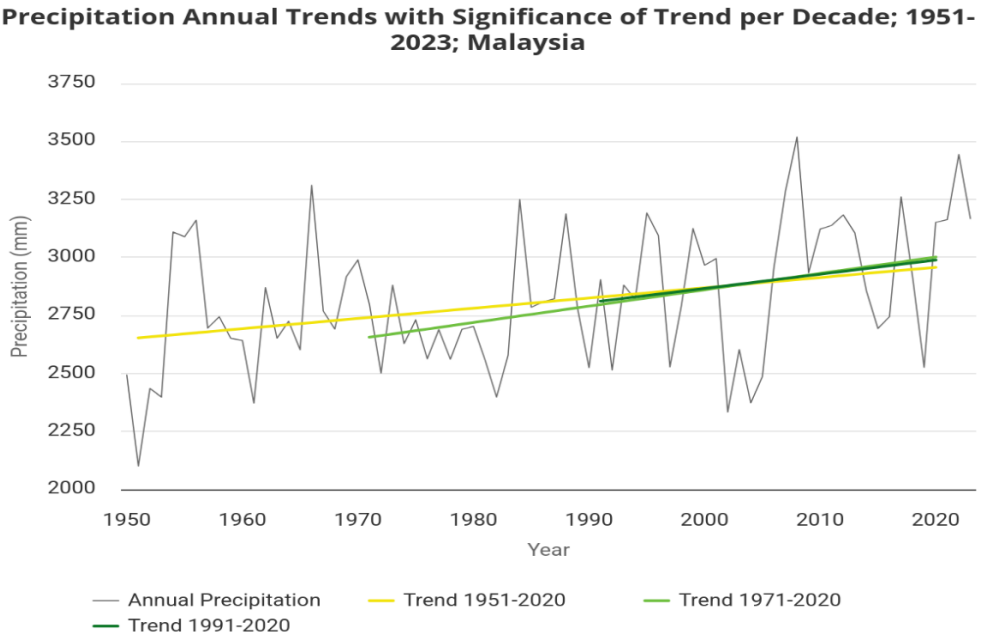

Figure 3: Precipitation Annual Trends with Significance of Trend per Decade (1951-2020) for Malaysia. Source: WBG Climate Change Knowledge Portal.

9. In the Figure 3, the annual precipitation trends from 1951 to 2023, shown with three distinct trend lines representing different periods suggest the yearly fluctuations in precipitation levels shown by the grey line, indicating considerable variability over the decades. The yellow trend line which represents the overall trend

from 1951 to 2020, shows a gradual increase in annual precipitation while the light green line indicates the trend from 1971 to 2020, showing an upward trend but slightly steeper, suggesting an acceleration in rainfall increase during this period. The dark green line, covering 1991 to 2020, shows an increase in precipitation, therefore implying a more recent intensification in rainfall levels. Overall, Figure 3 highlights a consistent long-term increase in Malaysia's annual precipitation which could contribute to the wetter conditions affecting rice cultivation cycles in the country.

B2. Historical Climate Trends in The Philippines

10. The Philippines has a humid climate characterized by high temperatures and heavy rainfall. Average annual rainfall is approximately 2,348 mm, but it varies geographically, from 960 mm in southeast Mindanao to over 4,050 mm in central Luzon. Temperatures are generally high, in the valleys and plains with an average temperature of about 27°C throughout the year. Similarly, humidity levels reach on an average of about 82% due to the warm moist trade winds that flow through the archipelago, as well as sea surface temperatures, a rich and vibrant vegetative cover and abundant rainfall. Rainfall is normally governed by the southwest monsoons in the summer months, and by the northeast monsoon and tropical cyclones in the winter. Convective rainfall is common in the mountainous terrain, interspersed with narrow coastal plains. Strong periodic droughts in the country are linked to the El Niño Southern Oscillation (ENSO)[26].

11. The Philippines' experiences its hottest months during April and May while the coldest months are during December, January and February, as per its climatology from 1991–2020 (Figure 4). The mean annual temperature is around 27.1°C which is accompanied by a relatively low seasonal temperature variation of approximately 3°C.

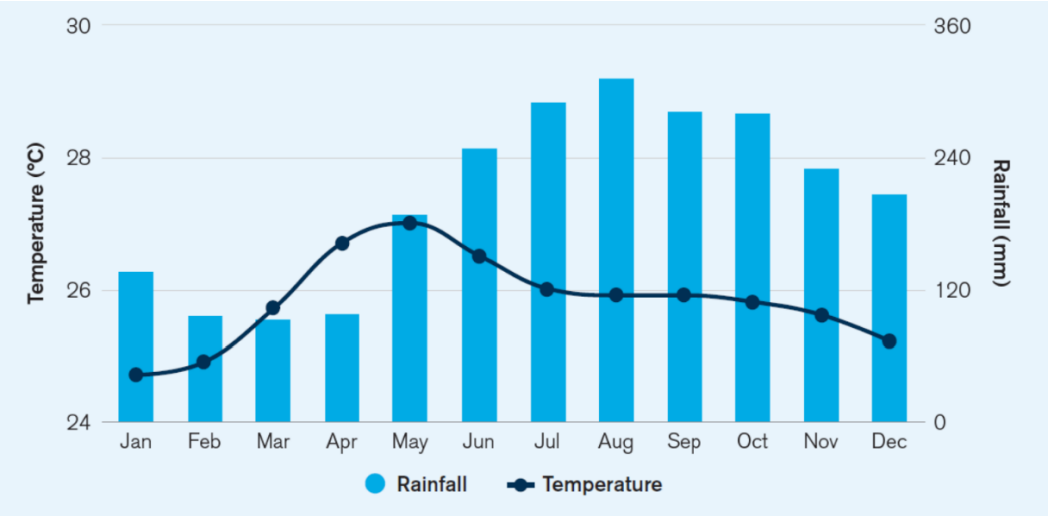

Figure 4: Average monthly temperature and rainfall in the Philippines (1991–2020) (Source: WBG Climate Change Knowledge Portal (CCKP, 2021).

12. Spatial temperature variations are minimal across the country. The distribution of precipitation is geographically varied with June to September accompanied by heavy rainfall that is concentrated to the west of the country, while between October and March, heavy rainfall is predominantly found in the country's eastern regions.

13. The Philippines historical temperature trends reported a rise of 0.62°C in annual average mean temperature between 1958–2014 while a significant increase in the number of hot days and warm nights

[26] https://climateknowledgeportal.worldbank.org/sites/default/files/2021-08/15852-WB_Philippines%20Country%20Profile-WEB.pdf

was observed between 1960–2003 throughout the country[27]. A study carried out by Salvacion et al. (2018), using Climate Research Unit time series data found that an average increase per year for maximum temperature is at 0.008°C and minimum temperature at 0.019°C[28]. Another study carried out by Cinco et al. (2014) reported a warming trend between 1951–2010 with an increase in annual mean temperatures, daily minimum mean temperatures and daily maximum mean temperatures[29]. These trends exhibit similar characteristics to those observed across the Pacific region in general[30]. Similarly, estimated historical temperature data from Berkeley Earth Dataset also showed that Manila experienced increased warming of 0.75°C between 1900–2017 and 2000–2017 on an average[31].

14. In terms of precipitation, Philippines observes a sharp increase in the amount and intensity of rainfall as a result of climate change, with more rainy days observed since the 1990s. Wetter conditions were also observed during the dry season with a five-year running average showing that more tropical cyclones of typhoon intensity are happening during El Niño events. The study by Salvacion et al., (2018) showed significant trends in monthly rainfall, with an increase of 0.34 mm/year.

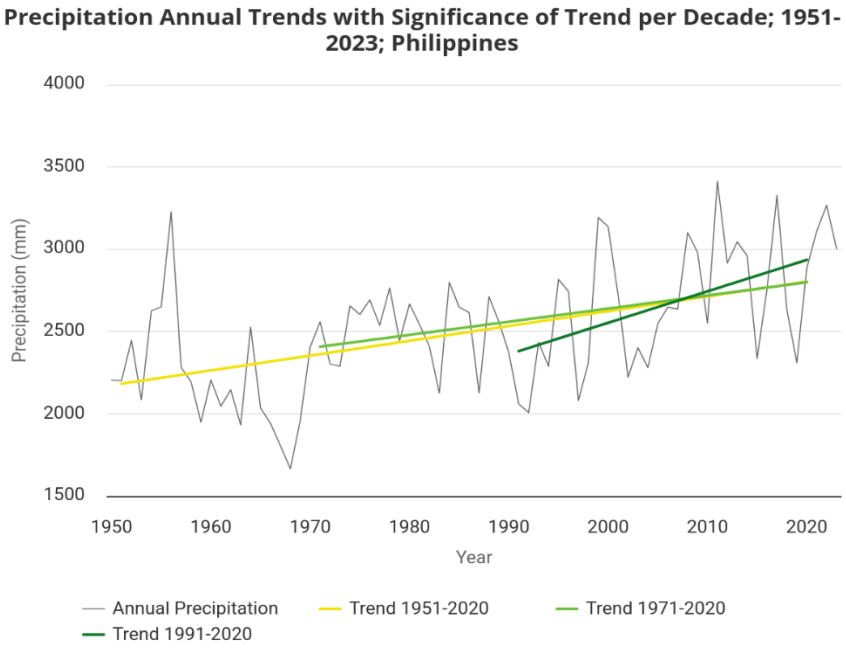

Figure 5: Precipitation Annual Trends with Significance of Trend per Decade (1951-2020) for the Philippines. Source: WBG Climate Change Knowledge Portal

15. Figure 5 above shows the annual precipitation trends in the Philippines from 1951 to 2023, highlighting variations and long-term patterns. The grey line illustrates year-to-year fluctuations, showing periods of both

[27] Philippines (2014). Second National Communication to the UNFCCC. URL: https://unfccc.int/sites/default/files/resource/phlnc2.pdf
[28] Salvacion, A.R., Magcale-Macandog, D.B., Sta. Cruz, P.C. et al. (2018). Exploring spatial patterns of trends in monthly rainfall and temperature in the Philippines based on Climate Research Unit grid. Spat. Inf. Res. 26: 471. URL https://link.springer.com/article/10.1007%2Fs41324-018-0189-8
[29] Cinco, T.G. de Guzman, R., Hilario, F and Wilson, D. (2014). Long-term trends and extremes in observed daily precipitation and near surface air temperature in the Philippines for the period 1951–2010. Atmospheric Research. 145–146. 12–26. URL: https://www. sciencedirect.com/science/article/pii/S0169809514001495?via%3Dihub
[30] Griffiths, G & Chambers, Lynda & R. Haylock, M & J. Manton, M & Nicholls, Neville & Baek, H.-J & Choi, Youngeun & Della-Marta, Paul & Gosai, A & Iga, N & Lata, R & Laurent, Victoire & Maitrepierre, Luc & Nakamigawa, H & Ouprasitwong, N & Solofa, D & Tahani, L
& T. Thuy, D & Tibig, L & Zhai, Panmao. (2005). Change in mean temperature as a predictor of extreme temperature change in the Asia–Pacific region. International Journal of Climatology. 25. 1301 - 1330. URL: https://rmets.onlinelibrary.wiley.com/doi/pdf/10.1002/joc.1194
[31] Carbon Brief (2018). Mapped: How every part of the world has warmed - and could continue to. Infographics, Berkeley Dataset. 26 September 2018]. URL: https://www.carbonbrief.org/mapped-how-every-part-of-the-world-has-warmed-and-could-continue-to-warm

high and low rainfall while the yellow trend line, for the period 1951 to 2020, indicates a gradual increase in annual precipitation over the decades. The light green trend line, during the period 1971 to 2020, shows a slightly upward trend, suggesting an accelerated increase in rainfall during this period. The dark green trend line, from 1991 to 2020, shows a more pronounced increase, indicating an increase in precipitation in the recent years. This pattern suggests that the Philippines has been experiencing more wetter conditions, during the last few decades. Such an increase in precipitation could be contributing to the shifting planting seasons, heightened flood risks, and greater unpredictability in agricultural cycles, affecting rice cultivation in the region.

C. Future Climate Scenarios

16. The climate projection data is derived from global climate models that have been compiled under the framework of Coupled Model Intercomparison Projects (CMIP), managed by the World Climate Research Programme. The data presented here is based on CMIP6, the sixth phase of the CMIP series, which contributes to the Intergovernmental Panel on Climate Change (IPCC) Assessment Reports and supported the Sixth Assessment Report. The data is available at a spatial resolution of 0.25º x 0.25º (25 km x 25 km) while the Shared Socioeconomic Pathways (SSPs) outline the potential global socioeconomic developments projected through 2100. These pathways are closely linked to the Representative Concentration Pathways (RCPs) used in CMIP5, which focus solely on atmospheric greenhouse gas concentrations.

17. SSPs are utilized to develop emission scenarios that consider various climate policy approaches. The five key scenarios are as follows:

i. **SSP1-1.9 or 2.6** (Sustainability - Opting for an Environmental Focus) combines the 'Sustainability' pathway (SSP1) with a low radiative forcing level of 1.9 W/m² or 2.6 W/m² by the year 2100.
ii. **SSP2-4.5 (Middle-of-the-Road)** scenario combines the 'Middle of the Road' socioeconomic pathway (SSP2) with a radiative forcing level of 4.5 W/m² by the year 2100.
iii. **SSP3-7.0** (Regional Rivalry - A More Challenging Path) scenario represents a future characterized by regional rivalry and a medium-high level of greenhouse gas emissions, leading to a radiative forcing of 7.0 W/m² by 2100.
iv. **SSP4-3.4** (Inequality - A Path Marked by Divisions): This scenario highlights a future characterized by significant socioeconomic inequalities. It represents a world where mitigation efforts are limited, leading to a radiative forcing level of 3.4 W/m².
v. **SSP5-8.5** (Fossil-Fuel-Driven Development - Following the Path of Intensive Industrialization): This scenario envisions a future where development is driven by the intensive use of fossil fuels. It represents a pathway with high greenhouse gas emissions, resulting in a radiative forcing level of 8.5 W/m².

C1. Future Climate Scenarios in Malaysia

18. Projected Precipitation Percent Change Anomaly for 2040-2059 for Malaysia under SSP2-4.5: The projection data under the SSP2-4.5 scenario for Malaysia, covering the period 2040-2059 with reference to 1995-2014, suggests an overall increase in annual precipitation (Figure 6). The spatial map indicates that most regions across Malaysia are projected to experience a moderate rise in precipitation, with varying intensity across different areas. The monthly trend chart shows fluctuations throughout the year, with precipitation changes ranging from slight decreases in March and April to significant increases in the latter half of the year, particularly from June to December. The highest positive anomalies are projected during August and December, while the early months, specially March, might witness slight reductions. Despite some seasonal variations, the general trend points towards an overall wetter climate for Malaysia under the SSP2-4.5 pathway.

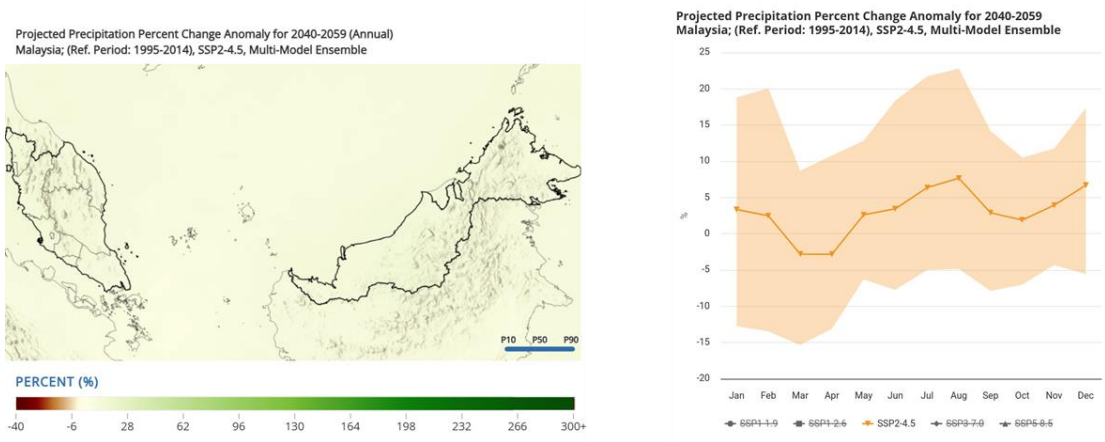

Figure 6: Percentage precipitation change under (a) SSP2-4.5 for 2060 in Malaysia
Source: WBG Climate Change Knowledge Portal

19. Projected Precipitation Percent Change Anomaly for 2040-2059 for Malaysia under SSP5-8.5: Based on the SSP5-8.5 scenario projections for Malaysia covering 2040-2059, the data indicates a general increase in annual precipitation percentages compared to the reference period (1995-2014) (Figure 7). The spatial map reveals mostly neutral to slight increases in precipitation across the region. Seasonally, the monthly trend shows a slight decrease in precipitation from January to March, followed by a gradual increase from May onwards, peaking in the later months of the year, particularly November and December. Although some variability exists, the overall trend under this high-emission scenario suggests that Malaysia may experience wetter conditions, especially towards the end of the year. The wide uncertainty range in the data highlights the complexity of future precipitation patterns under intensified climate change.

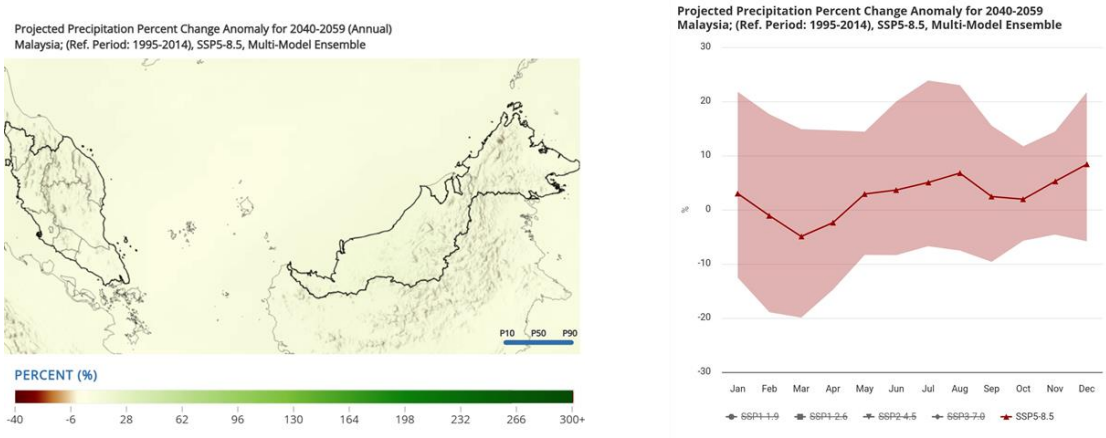

Figure 7: Percentage precipitation change under (a) SSP5-8.5 for 2060 in Malaysia
Source: WBG Climate Change Knowledge Portal

20. Projected Temperature Change Anomaly for 2040-2059 for Malaysia under SSP2-4.5: The projection data under the SSP2-4.5 scenario for Malaysia from 2040 to 2059 indicates an average annual surface air temperature anomaly of about 1.0 to 1.2°C above the reference period of 1995-2014 (Figure 8). The map highlights a relatively uniform temperature increase across the country, with slight regional variations. The monthly temperature anomaly graph also shows a consistent pattern throughout the year, with minor fluctuations, peaking slightly around May and September. Overall, the projections suggest a steady increase in temperature, reflecting the broader trends of global climate change under moderate greenhouse gas emission scenarios.

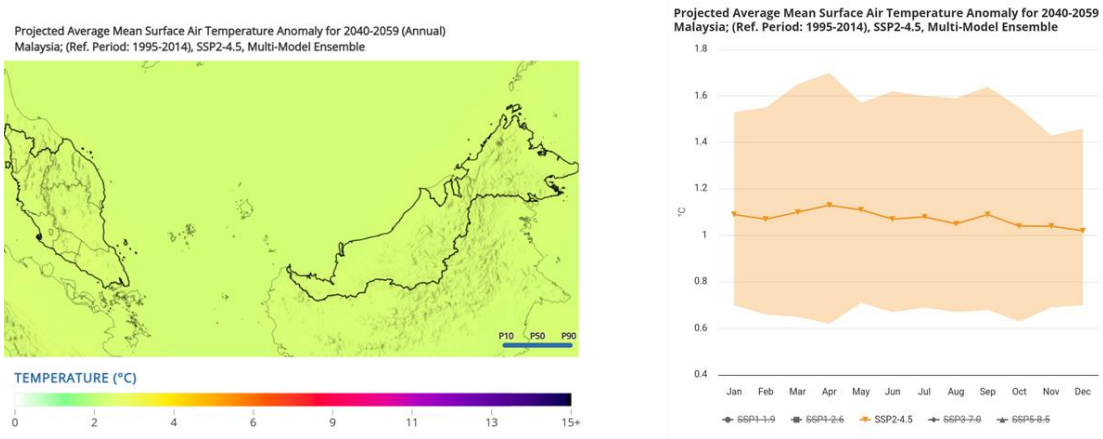

Figure 8: Projected temperature change under (a) SSP2-4.5 for 2060 in Malaysia
Source: WBG Climate Change Knowledge Portal

21. Projected Temperature Change Anomaly for 2040-2059 for Malaysia under SSP5-8.5: Under the SSP5-8.5 scenario, the projections for 2040-2059 indicate a similar range of temperature increases, with anomalies mostly between 1.5°C and 2.0°C (Figure 9). The spatial distribution is fairly uniform across the country, while the annual temperature trend shows minor fluctuations, with a slight peak in April and September. Despite SSP5-8.5 being a high-emission scenario, the projected temperature anomalies for this earlier period align closely with the SSP2-4.5 projections for the later period, highlighting the accelerating nature of climate change impacts under higher emissions pathways.

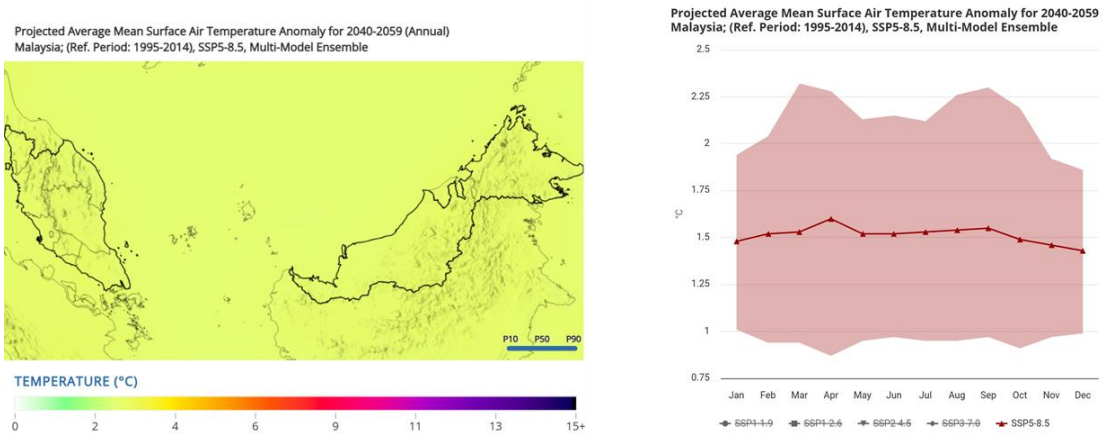

Figure 9: Projected temperature change under (a) SSP5-8.5 for 2060 in Malaysia
Source: WBG Climate Change Knowledge Portal

C2. Future Climate Scenarios in The Philippines

22. The Philippines and Malaysia will face a warmer climate by mid-century, with an average temperature rise of 1.2 to 1.9°C in most seasons. Rainfall patterns will become more intense and variable, leading to reduced yields and hence affecting food security. Analysis of historical temperature data of the Philippines indicates a warming trend since the mid-20th century, with average annual mean temperature increasing by approximately 0.6°C and a significant increase in hot days and warm nights. Northern and central Philippines will get wetter, while the south will get drier[32]. Both increased flooding and the increased

[32] https://doi.org/10.1002/joc.6301

likelihood of droughts could impact the rice cultivation land, and yield[33]. Rice farming communities need adaptation and mitigation measures to build resilience as rice yield is vulnerable to temperature increases.

23. Projected Precipitation Percent Change Anomaly for 2040-2059 for the Philippines under SSP2-4.5: The projected precipitation changes under the SSP2-4.5 scenario for the Philippines between 2040 and 2059 indicates a slight annual increase in precipitation, though the changes are spatially and seasonally variable (Figure 10). The map suggests that most regions will experience minor shifts, with some areas seeing slight increases while others may encounter reductions. The monthly chart illustrates that precipitation is projected to be relatively stable, with slight positive anomalies from June to December and minor negative deviations in the early months, particularly from March to May.

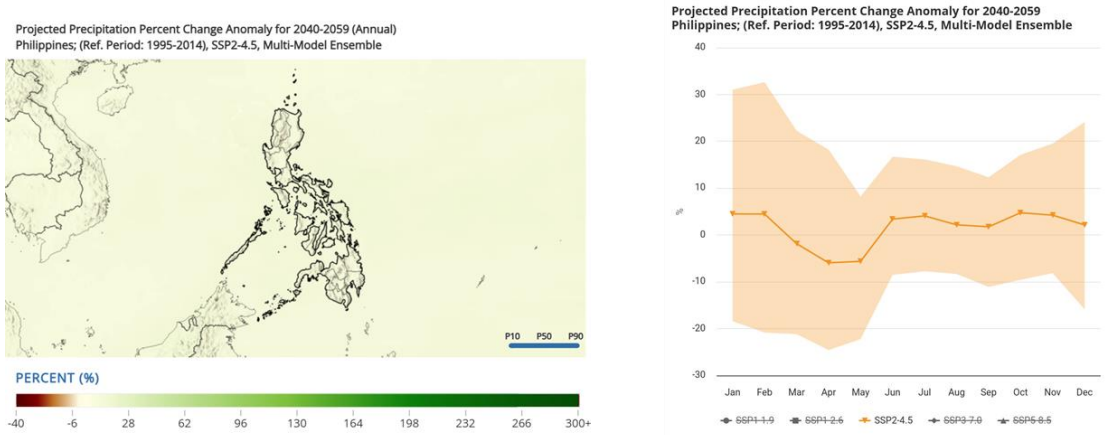

Figure 10: Percentage precipitation change under (a) SSP2-4.5 for 2060 in the Philippines
Source: WBG Climate Change Knowledge Portal

24. Projected Precipitation Percent Change Anomaly for 2040-2059 for the Philippines under SSP5-8.5: The projection data for precipitation changes in the Philippines under the SSP5-8.5 scenario for 2040-2059 indicates a varied pattern (Figure 11).

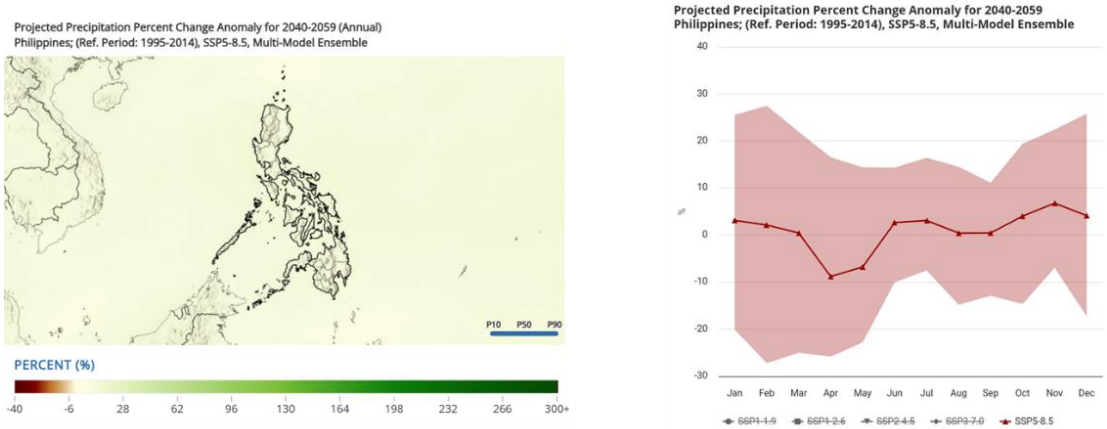

Figure 11: Percentage precipitation change under (a) SSP5-8.5 for 2060 in the Philippines
Source: WBG Climate Change Knowledge Portal

The map shows that most regions are expected to experience an increase in annual precipitation, with localized variations across the archipelago. The graph further highlights seasonal differences, with slight

[33] https://climateknowledgeportal.worldbank.org/sites/default/files/2021-08/15852-WB_Philippines%20Country%20Profile-WEB.pdf

decreases in precipitation observed around April and May, followed by increases towards the latter part of the year, particularly from October to December. The shaded area reflects the range of uncertainty, suggesting that while there is variability, the general trend leans towards increased precipitation, especially in the wet season.

25. Projected Temperature Change Anomaly for 2040-2059 for the Philippines under SSP2-4.5: The projection data for the Philippines under the SSP2-4.5 scenario, covering the period 2040-2059, indicates an average annual temperature increase compared to the 1995-2014 reference period (Figure 12). The spatial map shows a relatively uniform warming across the country, with temperature anomalies generally falling within the range of 1°C to 1.5°C. The monthly temperature anomaly graph further highlights that temperature increases will be fairly consistent throughout the year, with slight peaks around May. The shaded range in the graph indicates some uncertainty, suggesting that while the central estimate is about 1.1°C, variations could lead to slightly higher or lower warming. Overall, the data underscores a significant warming trend in the Philippines under a moderate emissions scenario, with implications for climate adaptation and resilience planning.

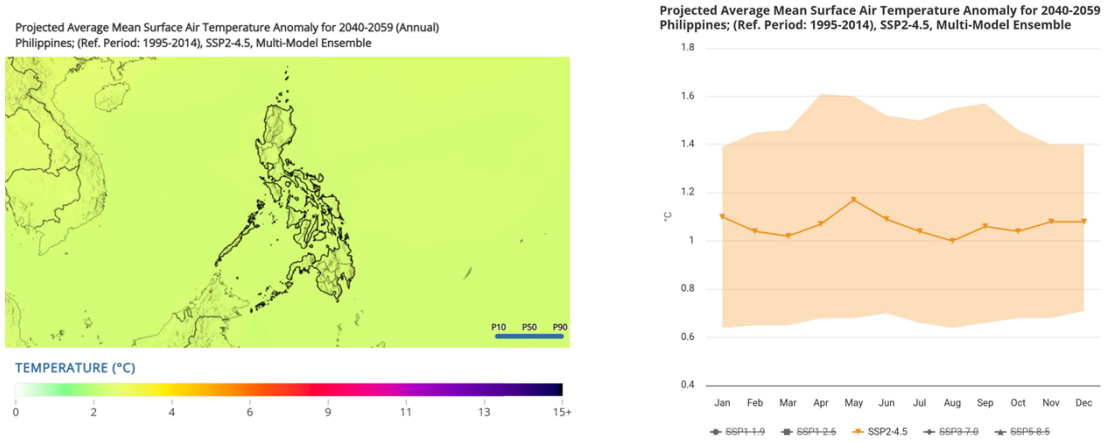

Figure 12: Projected temperature change under (a) SSP2-4.5 for 2060 in the Philippines
Source: WBG Climate Change Knowledge Portal

26. Projected Temperature Change Anomaly for 2040-2059 for the Philippines under SSP5-8.5: For the SSP5-8.5 scenario, projections for the period 2040-2059 suggest a higher level of warming in the Philippines compared to SSP2-4.5 (Figure 13). The map reveals a significant temperature increase across the country, and the graph shows annual temperature anomalies fluctuating between 1.4°C to 1.6°C, peaking during April and May. The broader range of uncertainty shown in the graph highlights potential variability in future climate conditions. This high-emission scenario underscores the critical need for significant mitigation strategies to reduce greenhouse gas emissions and limit long-term warming impacts.

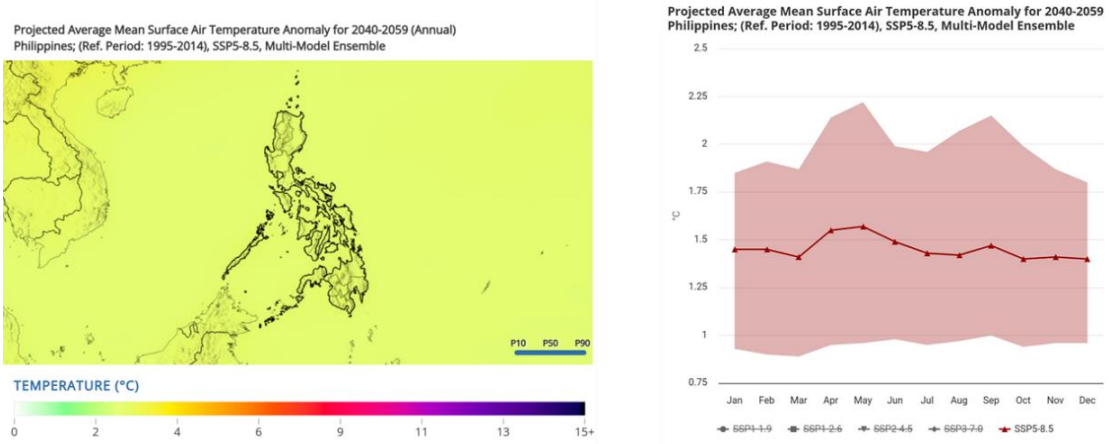

Figure 13: Projected temperature change under (a) SSP5-8.5 for 2060 in the Philippines
Source: WBG Climate Change Knowledge Portal

27. Target locations in the Philippines and Malaysia to address the climate vulnerabilities of rice farmers have been identified based on preliminary data gathered during the national level consultations. **Malaysia:** States projected to experience rice productivity loss due to climate impacts include Kedah, Pulau Pinang, and Sarawak.[34,35] In the **Philippines**, four target locations proposed are the top five rice producing regions that face the most severe natural hazards: Ilo Ilo, Bukindo, North Cotabato, and Nueva Ecija[36].

Table 1a: Climate Vulnerabilities by Province in Malaysia based on the Consultation Workshops

Province	Unique Vulnerabilities	Affected Communities	Key Impacts
Kedah	Water backflow, flooding, droughts, pests	Farmers in Pendang (MADA area)	Abandoned fields, economic losses, food insecurity
Pulau Pinang	Soft soil, droughts, water scarcity, pests	Farmers in IADA Pulau Pinang	Unharvested crops, reduced yields, financial strain
Sarawak	Droughts, pest attacks, lack of irrigation, soil issues	Iban farmers in Rh. Mancha, Daro	Crop failures, shift to other crops, loss of tradition

[34] Malaysia Third National Communication and Second Biennial Update Report to the UNFCCC (2018). “Based on model simulations for the periods of 2030 and 2050, MADA, KADA and IADA BLS may face significant reductions in average rice yield productions over all the seasons.”
[35] Kedah is known as Malaysia’s "Rice Bowl," and produces over half of the country's rice. However, rising temperatures and irregular monsoon patterns are leading to water stress and reduced yields. Increased pest outbreaks due to changing climate conditions also threaten rice productivity. Rice cultivation in Sarawak is largely subsistence-based with shifting cultivation common among indigenous communities. Increased flooding and changing rainfall patterns have shortened the growing season and led to lower yields. Although rice farming in Pulau Pinang is less extensive compared to other states, areas like Seberang Jaya rely on irrigation for paddy cultivation. However, increasing temperatures and irregular rainfall patterns are causing water shortages and yield reduction, while rising sea levels are posing a risk of saltwater intrusion into farmlands.
[36] Ilo Ilo is known as the "Rice Granary of the Visayas." It has fertile plains suitable for rice cultivation. However, rising temperatures, erratic rainfall, and saltwater intrusion from rising sea levels threaten productivity. Bukidnon is a major rice and corn producer in Mindanao that benefits from highland agro-climatic conditions. However, shifting rainfall patterns and prolonged droughts due to climate change are affecting water availability for irrigation. North Cotabato is a key agricultural hub in Mindanao that has vast rice fields but is increasingly vulnerable to flooding and drought. Climate change-induced extreme weather events pose risks to both yield stability and farmer livelihoods. Nueva Ecija is known as the "Rice Granary of the Philippines," that relies on extensive irrigation systems for high rice production. However, increasing temperatures and more frequent typhoons threaten yields, requiring climate-resilient farming practices.

Table 1b: Climate Vulnerabilities by Province in the Philippines based on the Consultation Workshops

Province	Unique Vulnerabilities	Affected Communities	Key Impacts
Iliolo	Shifted planting, increased El Niño, water scarcity, pests	Farmers in Dumangas, Banate, Oton, Dingle	Reduced yields, debt cycles, low incomes
Bukidnon	Droughts, soil erosion, pests, low adaptive capacity	Farmers in Kitaotao, Damulog	Reduced yields, economic instability
North Cotabato	Frequent flooding, El Niño, water issues, pests, soil degradation	Farmers in Kabacan, Pigcawayan	Crop failures, debt, low market prices
Neuva Ecija	Typhoon risks, erratic weather, water scarcity, pests, soil degradation	Non-irrigated farmers	Crop losses, debt traps, poverty

D. Project Objectives:

28. To enhance the climate resilience and food security of smallholder rice farmers in Malaysia and the Philippines by strengthening adaptive capacity against specific climate hazards, such as floods, droughts, rising temperatures, and pest outbreaks, through innovative agricultural technologies, improved climate intelligence, and inclusive institutional frameworks.

Specific objectives are :

i) Enhance adaptive capacity against drought and water scarcity of smallholder rice farmers in drought-prone regions of Malaysia and the Philippines by deploying climate-resilient rice varieties, biofertilizers, and precision water management technologies.
ii) Strengthen resilience to flooding and soil degradation by building resilience of rice farming communities in flood-prone regions of Malaysia and the Philippines by implementing flood-tolerant rice varieties, sustainable soil management practices, and improved drainage systems.
iii) Mitigate yield variability due to temperature rise and pest outbreaks with the aim towards reducing yield variability for smallholder farmers in Malaysia and the Philippines by introducing heat-tolerant rice varieties, integrated pest management (IPM), and impact-based forecasting systems to anticipate climate-induced pest outbreaks and extreme weather events.
iv) Improve access to climate-resilient extension services for marginalized groups by empowering small-holder farmers, particularly women and indigenous communities in Malaysia and the Philippines through gender-responsive training, climate-smart extension services, and inclusive adaptation planning to address limited access to resources and information.

29. To prevent or minimize maladaptation during project implementation, the project will proactively address maladaptation risks from the inception phase by adhering to the framework outlined in the IPCC 6th Assessment Report which are equitable, effective, and provide co-benefits for people, ecosystems, and climate mitigation. Sufficient time and resources will be allocated to identify any potential maladaptive outcomes during implementation. Any identified risks will be addressed in the final project design, aligning with the IPCC AR6 framework and criteria. The Climate Living Lab will also play a key role in minimizing maladaptation.

E. Project/Programme Components and Financing:

Table 2: Project components, expected outcomes and outputs, and its estimated financing requirements

Project/Programme Components	Expected Outcomes	Expected Outputs	Countries	Amount (US$)
1. Medium and large-scale climate-smart agriculture technologies and practices deployed through public-private partnerships to increase and diversify production, and to build the resilience of rice farming communities	1.1. Improved paddy production and resilience to climate change	1.1.1. Climate-resilient rice varieties introduced together with biofertilizer and other "Agriculture 4.0" applications and tools in Malaysia and the Philippines. 1.1.2. Deploy technologies to diversify income from biomass (e.g., rice-barn oil, compost)	Malaysia, The Philippines	5,000,000 (Malaysia: USD 3 million Philippines: USD 2 million)
	1.2. Increased adoption of climate-smart rice varieties and technologies in the Philippines	1.2.1. Establish climate-resilient farming demonstration sites and private-sector partnerships	The Philippines	
	1.3. Enhanced productivity and resilience of rice farming communities	1.3.1 Implement climate-smart agriculture techniques in key regions	Malaysia	
2. Strengthened integrated information & climate intelligence for farmers and institutions	2.1. Increased farmer capacity to adapt to climate change	2.1.1. Train farmers in CSA, GAP, water management, and digital tools via Farmer Climate Field Living Labs	Malaysia, the Philippines	3,500,000 (Malaysia USD 1.5 million: the Philippines USD 2 million)
	2.2. Improved access to data and climate information for decision-making	2.2.1. Develop impact-based forecasting, early warning systems, and localized climate-smart maps	The Philippines	
		2.2.2. Strengthen data collection and water allocation frameworks	Malaysia	
	2.3. Strengthened data-driven agricultural planning	2.3.1. Establish real-time climate intelligence platforms and decision-making tools	Malaysia	
3. Institutional capacity building for localized adaptation strategies to create enabling environment for investments in Agriculture Marketing Services	3.1. Enhanced policies, frameworks and institutional capacity to invest for better climate change adaptation	3.1.1. Train government staff and farmers (especially women) on CSA and market risk management	Malaysia, the Philippines	2,500,000 (Malaysia: USD 1.2million Philippines: USD 1.3 million)
		3.1.2. Develop climate adaptation and investment plans for Agricultural Marketing Services		
	3.2 Increased institutional support for climate-adaptive farming practices	3.2.1. Strengthen DA-AMIA and farmer organizations for resilience and market integration	The Philippines	
	3.3. Improved policy support and investment in climate-resilient agriculture	3.3.1. Conduct policy dialogues and capacity buildings with research collaboration (e.g., Malaysian Agricultural Research	Malaysia	

		and Development Institute (MARDI)		
4. Regional knowledge platform for South-South Cooperation	4.1. Established regional platform for climate information and best practices	4.1.1. Share best practices, policy recommendations, and results via a regional knowledge hub	Malaysia, the Philippines, other relevant countries	500,000
	4.2. Enhanced regional collaboration and exchange of best practices	4.2.1. Support joint demonstrations and cooperation frameworks (e.g., Brunei-Indonesia-Malaysia-Philippines East ASEAN Growth Area (BIMP-EAGA))		
5. 7. Project/Programme Execution cost				910,000
8. Total Project/Programme Cost				**12,410,000**
9. Project Cycle Management Fee				**1,241,000**
Amount of Financing Requested				**13,651,000**

Projected Calendar:

Project Duration: 4 years (48 months)

Table 3: Indicate the dates of the following milestones for the proposed project/programme

Milestones	Expected Dates
Start of Project/Programme Implementation	Q2, 2026
Mid-term Review (if planned)	Q4, 2028
Project/Programme Closing	Q2, 2030
Terminal Evaluation	Q4, 2030

PART II: PROJECT / PROGRAMME JUSTIFICATION

A. Project Components

30. Theory of Change: The Theory of Change (ToC) for the project outlines a clear pathway to enhance climate resilience and food security for smallholder rice farmers by addressing vulnerabilities to climate hazards such as flooding, droughts, rising temperatures, and pest outbreaks. The project's interventions, supported by $13.78 million in funding, are structured across four components that collectively drive a paradigm shift in rice farming productivity and resilience.

31. Interventions and Outputs: The project will deploy climate-smart agricultural technologies through Component 1, including climate-resilient rice varieties, biofertilizers, and Agriculture 4.0 tools like precision farming and drone technology (Output 1.1), alongside biomass utilization for diversified income (e.g., rice-bran oil, compost; Output 1.2) and demonstration sites with private-sector partnerships (Output 1.3). Component 2 will strengthen climate intelligence by training farmers in climate-smart agriculture (CSA), good agricultural practices (GAP), and water management through Farmer Climate Field Living Labs (Output 2.1), developing impact-based forecasting and early warning systems (Output 2.2), and establishing real-time climate data platforms (Output 2.3). Component 3 will enhance institutional capacity through training government staff and farmers, particularly women, on CSA and market risk management

(Output 3.1) and developing adaptation and investment plans for Agricultural Marketing Services (Output 3.2) while Component 4 aims to foster regional collaboration via a knowledge hub to share best practices (Output 4.1).

32. Outcomes: Component 1 will enhance paddy production and the resilience of farming communities to climate change (Outcome 1). This will generate co-benefits including the establishment of public-private partnerships and the diversification of production systems. Component 2 will strengthen farmers' capacity to obtain, use, and integrate climate information and intelligence (Outcome 2). In parallel, it will support the development of data-driven agricultural planning, enabling more informed decision-making at the farm and policy levels. Component 3 will improve policies, frameworks, and institutional capacity for climate-adaptive farming practices (Outcome 3), fostering an enabling environment for investments in agricultural marketing services and promoting integrated approaches across departments and farmer organizations. Component 4 will establish a regional knowledge platform for climate information exchange and best practices sharing (Outcome 4), thereby enhancing South-South cooperation and scaling up climate resilience efforts through collaborative learning and innovation.

33. Contribution to Climate Resilience: By equipping farmers with resilient seed varieties, real-time climate data, and diversified income sources, the project will directly mitigate yield losses from climate hazards, as evidenced by the projected 10% yield decline per 1°C temperature rise in the Philippines. Training and institutional strengthening will ensure that adaptive capacity is embedded in local governance and farmer practices, while the regional platform will scale solutions across ASEAN, leveraging frameworks like BIMP-EAGA. These efforts can collectively help achieve the long-term impact of increased, climate-resilient rice productivity, reducing food insecurity for vulnerable communities in Malaysia and the Philippines, aligning with the Adaptation Fund's goals of transformative adaptation.

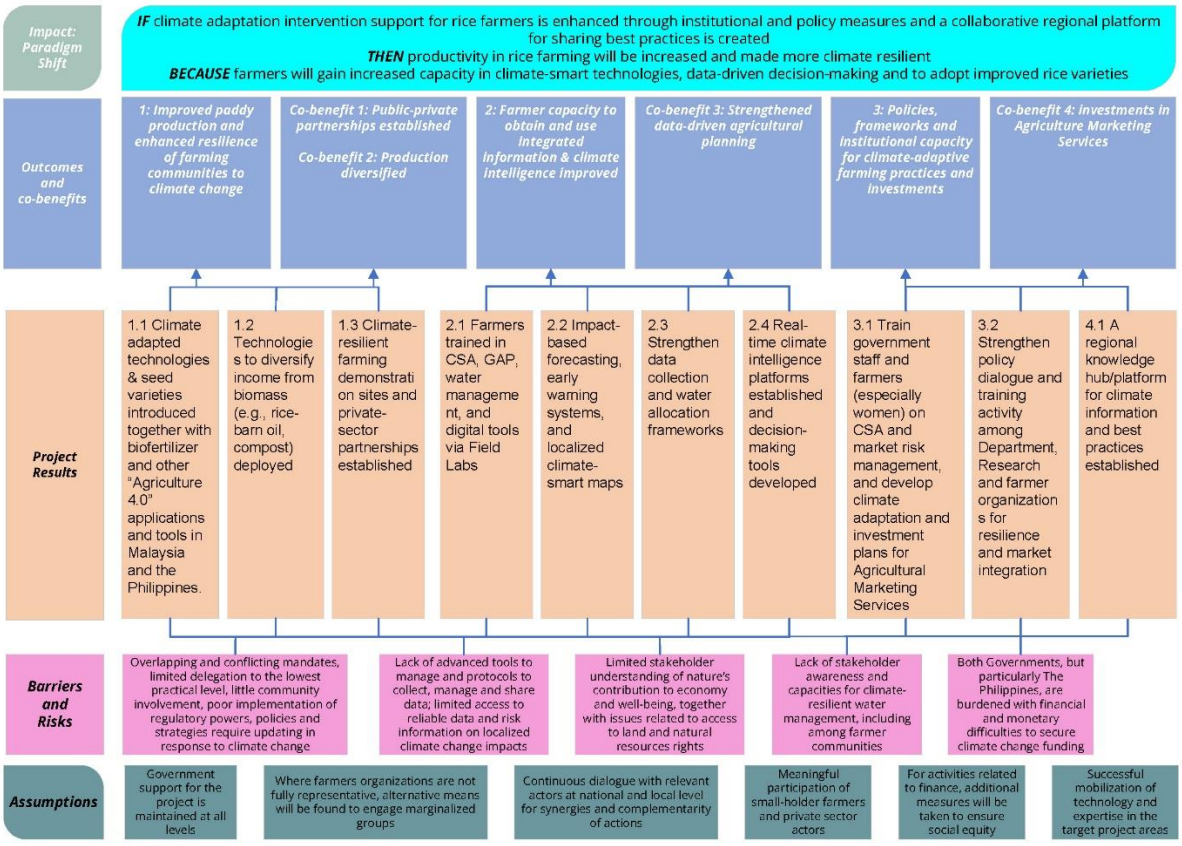

Figure 14: Project Theory of Change (ToC)

34. **Component 1.** Implementation of this component in Malaysia and the Philippines will involve a multi-stakeholder approach that includes government agencies, private sector partners, research institutions, and farming communities. In Malaysia, climate-resilient rice varieties and biofertilizers will be introduced alongside precision farming tools, drone technology, and digital monitoring systems to optimize rice production while adapting to climate risks. Technologies that enhance biomass utilization, such as rice-bran oil extraction and composting, will be deployed to create alternative income streams for farmers. In the Philippines, the focus will be on establishing climate-resilient farming demonstration sites in collaboration with the private sector to promote best practices in climate-smart agriculture. These sites will serve as training hubs for farmers, enabling them to adopt advanced techniques such as sustainable water management, integrated pest control, and soil fertility enhancement. By leveraging public-private partnerships, this component will facilitate knowledge transfer, capacity-building, and the adoption of scalable climate-resilient rice varieties in both countries.

35. This component will aim to increase and diversify rice production while enhancing resilience among farming communities by adopting climate-smart agricultural technologies. The focus will be on introducing climate-resilient rice varieties and biofertilizers, alongside Agriculture 4.0 applications, including digital farming tools, in Malaysia and the Philippines. The project will also deploy technologies to create alternative income sources through biomass utilization, such as rice-bran oil and compost production. Climate-resilient farming demonstration sites will be established in the Philippines through partnerships with the private sector, ensuring the adoption of innovative climate-smart agriculture techniques in key rice-growing regions of the Philippines.

Outcome 1.1. Improved paddy production and resilience to climate change

Output 1.1.1. Climate change resistant seed varieties introduced together with biofertilizer and other "Agriculture 4.0" applications and tools in Malaysia and the Philippines.

36. The implementation of Output 1.1.1 will begin with the identification and selection of climate change-resilient rice varieties that have been tested for suitability in the diverse agro-climatic conditions of Malaysia and the Philippines. The project will not be introducing or using potentially invasive, non-indigenous alien species. Research institutions, in collaboration with agricultural agencies and private sector partners, will play a key role in the development and distribution of these resilient seed varieties. In Malaysia, selected pilot sites will be established to conduct trials of these varieties under different agro-climatic regions, ensuring that farmers receive seeds optimized for local conditions. Alongside improved seed varieties, biofertilizers will be introduced to enhance soil health and reduce dependence on chemical fertilizers. This initiative will involve partnerships with research institutions and private sector suppliers to ensure the availability of cost-effective, high-quality biofertilizers. Training programs and workshops will be conducted to educate farmers on the benefits of biofertilizers and best practices for application, contributing to improved soil fertility and overall farm productivity.

37. To complement these efforts, Agriculture 4.0 technologies will be deployed, including precision agriculture tools such as remote sensing, drones, and digital farming platforms. In the Philippines, digital applications for farm monitoring and decision support systems will be integrated with climate information services to provide farmers with real-time guidance on planting, irrigation, and pest control. Malaysia will leverage similar applications to optimize water use and improve crop management practices, which will be introduced through capacity-building programs and farm demonstrations, enabling farmers to gain hands-on experience and adopt innovative and climate-smart agricultural technologies. These technologies will be introduced through capacity-building programs and farm demonstrations where farmers can gain hands-on experience in adopting innovative, climate-resilient farming solutions.

Output 1.1.2. Deploy technologies to diversify income from biomass (e.g., rice-barn oil, compost)

38. To maximize the utilization of rice biomass and enhance farmers' income, the project will introduce scalable technologies for processing biomass into value-added products such as rice-bran oil and organic compost.

39. In Malaysia, pilot biomass processing facilities will be established with integrated digital technologies to enhance operational efficiency. In the Philippines, community-based cooperatives will be empowered to manage localized biomass processing units, creating sustainable value chain linkages and increasing income opportunities for farmers.

40. This output will try to complement other project components by integrating climate-smart agricultural practices and digital solutions from Component 1 while leveraging climate intelligence from Component 2 to optimize production efficiency. Private sector engagement will be crucial in providing technical expertise and market access for biomass-based products, ensuring long-term sustainability. Similarly, knowledge-sharing under Component 4 will facilitate the regional exchange of best practices in biomass utilization, strengthening South-South cooperation in climate adaptation strategies.

Outcome 1.2. Increased adoption of climate-smart rice varieties and technologies in the Philippines

Output 1.2.1. Establish climate-resilient farming demonstration sites and private-sector partnerships

41. The project will establish climate-resilient farming demonstration sites in key rice-producing regions of the Philippines. These sites will showcase best practices in climate-smart agriculture, including adaptive rice varieties (excluding potentially invasive, non-indigenous alien species)., efficient irrigation methods, and integrated pest management techniques. These demonstration sites will also serve as hubs for training and capacity-building activities, equipping farmers with the skills needed to implement climate-smart technologies on their own farms. The project will leverage digital tools and climate intelligence platforms from Component 2 to provide real-time guidance on farm management, strengthening farmers' adaptive capacity.

Outcome 1.3. Enhanced productivity and resilience of rice farming communities

Output 1.3.1 Implement climate-smart cultivation techniques in key regions

42. In Malaysia, climate-smart cultivation techniques will be implemented in key rice-growing regions to enhance productivity and resilience. The project will promote sustainable water management practices, precision agriculture technologies, and soil fertility enhancement strategies tailored to local environmental conditions. Demonstration sites will be set up to showcase these techniques, providing farmers with practical exposure to climate-adaptive farming methods.

43. Similarly, digital tools and climate intelligence from Component 2 will be introduced to support real-time farm decision-making, ensuring optimized resource use and improved yields. Training programs will be conducted to equip farmers with the knowledge and skills needed to adopt these innovative practices. D

44. **Component 2**. Strengthened integrated information & climate intelligence for farmers and institutions. This component will seek to enhance farmers' adaptive capacity and institutional decision-making by improving access to climate information and early warning systems. The project will establish Farmer Climate Field Living Labs in Malaysia and the Philippines to train farmers in climate-smart agriculture (CSA), good agricultural practices (GAP), water management, and digital tools. An impact-based forecasting system and early warning mechanisms, including localized climate-smart mapping, will be developed in the Philippines while in Malaysia, the project will strengthen data collection systems and establish water allocation frameworks to enhance efficiency in agricultural water use. A real-time climate intelligence platform and decision-making tools will also be introduced to support data-driven agricultural planning in Malaysia.

2.1. Increased farmer capacity to adapt to climate change

2.1.1. Train farmers in CSA, GAP, water management, and digital tools via Field Labs

45. The project will establish Farmer Climate Field Living Labs in Malaysia and the Philippines to train farmers in climate-smart agriculture (CSA), good agricultural practices (GAP), water management, and digital tools. These labs will serve as hands-on learning centers where farmers can gain practical experience in sustainable farming techniques, efficient irrigation methods, and the use of digital technologies for climate adaptation. Training programs will be developed in collaboration with research institutions, agricultural agencies, and private sector partners to ensure the latest innovations are accessible to farming communities. By integrating real-time climate intelligence and decision-support tools from Component 2, the project will tend to enhance farmers skills and knowledge needed to build resilience, optimize resource use, and improve productivity in the face of climate change.

Outcome 2.2. Improved access to data and climate information for decision-making

46. Under this outcome, the focus will be on strengthening integrated information and climate intelligence to enhance the resilience of rice farmers and improve institutional decision-making. To build farmers' adaptive capacity, Farmer Climate Field Living Labs will be established in target areas to promote climate-smart agriculture (CSA) practices, good agricultural practices (GAP), and water management techniques. These labs will serve as interactive learning platforms where farmers can test, adopt, and scale climate-resilient technologies, including digital tools for real-time climate monitoring and precision farming.

Output 2.2.1. Develop impact-based forecasting, early warning systems, and localized climate-smart maps

47. Under this output, it will intend to develop an impact-based forecasting and early warning system (EWS) together with introducing sub-seasonal forecast availability to farmers for enhanced early warning (EW) that will be piloted in the Philippines to provide farmers with timely alerts on floods, droughts, and extreme weather events, enabling anticipatory action to mitigate climate risks.

Output 2.2.2. Strengthen data collection and water allocation frameworks

48. To support informed decision-making, the output intends to strengthen the data collection systems by enhancing local databases through integration of climate and agricultural data and improving accessibility for farmers and institutions in Malaysia. A water accounting and allocation framework will also be introduced to ensure efficient water use in agriculture as droughts are likely to be more frequent in the future in the region[37].

49. Overall, Outcome 2.2 will seek to enhance the institutional coordination by improving the flow of climate and natural resource data between regional, national, and local entities. This integrated approach will ensure that farmers and institutions have access to actionable climate intelligence, strengthening their resilience to climate change impacts.

Outcome 2.3. Strengthened data-driven agricultural planning

Output 2.3.1. Establish real-time climate intelligence platforms and decision-making tools

50. To strengthen data-driven agricultural planning in Malaysia, the project will develop and deploy real-time climate intelligence platforms that will integrate advanced data analytics, satellite observations, and on-the-ground sensors. These platforms will provide farmers and institutions with actionable insights on weather patterns, soil conditions, and crop health, enabling informed decision-making to optimize

[37] Additionally, the component will improve and coordinate information flow for climate, agricultural, water resources and land use/land cover data between regional, national and local level institutions to manage impacts of climate change and climate extremes.

agricultural productivity and resilience. Decision-support tools will be designed to facilitate adaptive planning, allowing stakeholders and farming communities to respond proactively to climate-related risks. Training programs and capacity-building initiatives (Component 3) will be implemented to ensure that farmers and policymakers can effectively utilize these digital tools, bridging the gap between climate data and on-farm applications.

51. **Component 3.** Institutional capacity building for localized adaptation strategies to create enabling environment for investments in Agriculture Marketing Services. This component will provide institutional capacity building on the interventions identified in Component 1 and 2. The successful implementation of climate and localized adaptation strategies in agriculture will require strong institutional capacity, policy support, and investment frameworks. Therefore, this component will try to enhance policies, institutional frameworks, and the technical capacity of government agencies and farmers to enable effective climate adaptation and investments in agricultural marketing services.

Outcome 3.1. Enhanced policies, frameworks and institutional capacity to invest for better climate change adaptation

Output 3.1.1. Train government staff and farmers (especially women) on CSA and market risk management

52. To achieve this output, the project will provide targeted training to district, provincial, and national government staff on climate adaptation measures, implementation procedures, and the integration of Climate Smart Agriculture (CSA) and Goods and Agricultural Practices (GAP) interventions to ensure food and water security while also training concerned policy makers and regulators on climate resilient agriculture practices to assist in food security of the project countries with social inclusion. The project will also give special emphasis on enhancing the capacity of farmers, particularly women, to plan, adapt, and manage climate and market risks, equipping them with knowledge on risk diversification, sustainable resource management, and financial planning. This enhanced capacity will help manage climate change impacts on the food systems that is likely to occur. The training programs will be aligned in a way that it will increase awareness on optimizing farm inputs to increase productivity and income, while promoting reinvestment of profits back into the farm or into higher-value secondary agricultural production.

Output 3.1.2. Develop climate adaptation and investment plans for Agricultural Marketing Services

53. Through this output, the project will strengthen farmers' resilience by supporting development and improvement of localized climate adaptation plans and investment strategies for Agricultural Marketing Services, while ensuring alignment with national policies and private sector engagement. An Agricultural Protection Scheme will also be introduced to address residual climate risks, offering risk transfer mechanisms such as insurance and contingency funds.

54. Through these interventions, the project will create an environment towards enabling policy and investment that will encourage sustainable agricultural practices, improves market access, and builds climate-resilient agricultural value chains. This in turn will enhance the capacity of farmers on available financing options to support long-term climate adaptation and resilience, giving strong focus on integrating small-scale farmers into modern agricultural value chains.

Outcome 3.2 Increased institutional support for climate-adaptive farming practices

Output 3.2.1. Strengthen DA-AMIA and farmer organizations for resilience and market integration

55. To enhance institutional support for climate-adaptive farming in the Philippines, the project will strengthen DA-AMIA (Department of Agriculture – Adaptation and Mitigation Initiative in Agriculture) and farmer organizations by building their capacity in climate resilience strategies and market integration. Training programs will be conducted to improve knowledge of climate-smart practices, risk management,

and financial literacy. Farmer cooperatives will be supported in accessing climate-resilient inputs, financial resources, and market opportunities. Efforts will be made to establish partnerships with the private sector and financial institutions to facilitate investment in climate-resilient rice farming, ensuring that smallholder farmers benefit from improved market access and sustainable income generation.

Outcome 3.3. Improved policy support and investment in climate-resilient agriculture

Output 3.3.1. Conduct policy dialogues and training with research collaboration (e.g., Malaysian Agricultural Research and Development Institute (MARDI)

56. The project will facilitate policy dialogues and research collaboration to enhance support for climate-resilient agriculture in Malaysia. Engagements with the ministries, Malaysian Agricultural Research and Development Institute (MARDI) and relevant agencies will be organized to develop evidence-based policy recommendations and investment strategies for climate-smart rice farming while dialogues will be carried out to bring policymakers, private sector representatives, and farmer organizations to align agricultural policies with climate adaptation goals.

57. Training programs and capacity-building workshops will also be conducted to enhance institutional knowledge of climate-smart practices, market-driven agricultural policies, and innovative financing mechanisms. Through collaboration with research institutions, the project will generate data-driven insights to inform policy decisions, ensuring that climate resilience is mainstreamed into national and regional agricultural strategies.

58. **Component 4:** Regional Knowledge Platform for South-South Cooperation. In order to establish collaboration and knowledge-sharing across countries, this component intends to set up a Regional Platform for Climate Information Exchange and Transfer of Best Practices that would provide insights from all the components and other similar projects in the region, therefore allowing governments, research institutions, and agricultural stakeholders to access and share critical climate resilience insights for supporting rice farming. UNIDO will collaborate with executing entities to set up the platform for climate-resilient rice plantation and enhance regional cooperation. The platform will be guided by the project steering committee and will be participated by related projects funded by GEF, GCF, and others in the region[38]. The platform will serve as a centralized hub where regional best practices, policy recommendations, and project results will be documented and shared to stakeholders showcasing how the lessons learned from adaptation initiatives can be scaled and replicated across the region. This component will also strengthen regional cooperation and facilitate joint collaborations on climate resilience for rice plantation. Under this component, regional workshops and knowledge-sharing events will be organized, bringing together policymakers, scientists, farmer organizations, and private sector entities to exchange ideas and experiences, emerging challenges, and promoting innovative solutions for climate smart agriculture.

Outcome 4.1. Established regional platform for climate information and best practices

Output 4.1.1. Share best practices, policy recommendations, and results via a regional knowledge hub

59. The project will establish a regional knowledge hub to facilitate the exchange of best practices, policy recommendations, and project results between Malaysia, the Philippines, and other ASEAN countries. This platform will serve as a repository of climate-smart agricultural innovations, including adaptive rice production techniques, resilient seed varieties, and digital farming tools.

[38] For instance, GEFID10207: Building climate resilient livelihoods in vulnerable landscapes in Bangladesh (BCRL); GEFID10177: Promoting Climate-Resilient Livelihoods in Rice-Based Communities in the Tonle Sap Region;
GEFID10187: Climate Smart Agriculture alternatives for upland production systems in Lao PDR; GEFID10929: Public-Private Blended Finance Facility for Climate-Resilient Rice Landscapes (Bangladesh, Cambodia, Vietnam).

60. In Malaysia, the hub will be integrated with existing research institutions such as MARDI, enabling policymakers and farmers to access data-driven insights and successful case studies. In the Philippines, DA-AMIA and other national institutions will contribute localized knowledge and experiences from climate-resilient farming initiatives. Regular knowledge-sharing events, webinars, and regional forums will be organized to foster South-South cooperation, ensuring that lessons learned from project interventions are widely disseminated and adopted across the region.

Outcome 4.2. Enhanced regional collaboration and exchange of best practices

Output 4.2.1. Support joint demonstrations and cooperation frameworks (e.g., Brunei-Indonesia-Malaysia-Philippines East ASEAN Growth Area (BIMP-EAGA))

61. The project will facilitate joint demonstrations and cooperation frameworks within the Brunei-Indonesia-Malaysia-Philippines East ASEAN Growth Area (BIMP-EAGA) to enhance regional collaboration in climate-smart rice production.

62. In Malaysia, research institutions like MARDI will lead field demonstrations showcasing adaptive rice varieties, precision agriculture technologies, and biomass utilization techniques. These demonstrations will be linked with regional knowledge exchange programs to share best practices with neighbouring countries. In the Philippines, DA-AMIA and farmer cooperatives will participate in cross-border learning initiatives, engaging with regional partners to adopt and scale up successful climate adaptation strategies.

63. Regular multi-stakeholder dialogues, workshops, and joint training sessions will strengthen institutional collaboration, fostering long-term partnerships for sustainable agricultural development across the region.

B. Innovations to climate change adaptation

64. The project will promote new and innovative climate adaptation solutions by integrating cutting-edge technologies, novel approaches, and improved mechanisms for climate-smart agriculture. Climate-resilient agricultural practices will be one of the key innovations that will be introduced which will be combined with biofertilizers and Agriculture 4.0 technologies such as precision farming tools, improved early warning systems integration impact-based forecasting and warnings services, and digital climate advisory services. These technologies will be tested and deployed through Farmer's Climate Field Living Labs, allowing rice farmers to experiment with and adopt innovative practices that enhances their productivity and climate resilience.

65. The project will also promote impact-based forecasting and anticipatory action mechanisms, allowing farmers to leverage improved climate data and predictive analytics for timely early warnings for floods, droughts, and extreme weather events. Similarly, the development of a water accounting and allocation system will provide a structured approach to optimal water use in agriculture, thus ensuring sustainability in the face of increasing drought risks.

66. The project will also foster institutional innovation to create an environment for adaptation investments/financing by strengthening financial mechanisms to enhance access to climate finance, particularly for smallholder farmers, and integrating climate adaptation strategies into agricultural marketing services to promote value chain resilience. It will further leverage regional cooperation through a Regional Platform for climate information exchange and transfer of best practices, allowing both Malaysia and the Philippines to exchange best practices, policy recommendations, and research findings, while fostering South-South collaboration for climate adaptation.

C. Economic, Social, and Environmental Benefits

67. The project is designed to generate economic, social, and environmental benefits, with a strong focus on supporting the most vulnerable communities and groups, including women, smallholder farmers, and marginalized populations.

68. Environmental benefit: By promoting CSA practices, the project is likely to bring environmental benefits by improving soil health and reduce the use of harmful chemicals, leading to healthier ecosystems, thus enhancing the biodiversity in the target locations, and reducing the environmental impacts. The project can enhance water use efficiency in agriculture, potentially alleviating water scarcity and maximizing its use. With the proposed Living Lab tied to a government entity and Farmer's self-help groups, farmers' trust will increase, minimizing maladaptation risks.

69. Economic Benefits: The project will enhance the livelihoods and financial security of smallholder rice farmers by increasing productivity and income as it will help leverage the farming communities in adopting climate-smart agriculture (CSA) technologies, and Good Agricultural Practices (GAP) allowing them to diversify income-generating activities. The introduction of climate-resilient rice varieties, precision farming, and optimized water management techniques would benefit farmers in Malaysia and the Philippines to achieve much higher and more stable rice yields, even in the face of climate uncertainties. The project will also support diversification of income sources through rice-bran oil or the other mid-scale deployment projects, thus creating new market opportunities and employment. The farming community particularly, the smallholder farmers will also have the scope of accessing climate finance and other investments in agricultural marketing services therefore enabling them to transition into modern, and competitive value chains while reducing their economic vulnerability. By enhancing the institutional capacity of district-level agricultural departments, the project will ensure long-term economic stability in the rice sector by reducing the risks associated with climate-induced crop failures and ensuring a resilient food supply chain.

70. Social Benefits: In terms of social benefits, the project will take an inclusive and community-driven approach by prioritizing the needs of women, youth, and marginalized farming communities. Communities playing a critical role in rice production will benefit from targeted training programs to strengthen their role in decision-making, climate adaptation, and market integration. The project will try to support gender-responsive adaptation strategies to ensure that women farmers have equal access to resources, information, and financial support. Hands-on training would be provided through the Farmer's Climate Field Living Labs that would ensure community resilience through learning and knowledge-transfer. The project will also address food security concerns by ensuring that vulnerable populations food secure. Beyond training, the project will enhance the resilience of women, youth, and marginalized farming communities in Malaysia and the Philippines by ensuring equitable access to resources, fostering leadership roles, and providing financial support. Women and marginalized groups, such as indigenous farmers can gain access to climate-resilient rice varieties, biofertilizers, and digital tools through gender-responsive strategies (Component 3, Output 3.1.1), addressing barriers like limited resource ownership. Youths will benefit from market access for value-added products like rice-bran oil (Component 1, Output 1.1.2), promoting economic inclusion. The project will also provide leadership opportunities for women and marginalized groups to enable them to shape localized adaptation plans (Output 3.1.2) and participate in regional knowledge platforms (Component 4, Output 4.2.1), while youth will get the opportunity to advocate for climate-smart practices in frameworks like BIMP-EAGA. Financially, the project will link these groups to climate finance, crop insurance, and agricultural marketing services (Component 3, Output 3.1.2), reducing economic vulnerability and enabling reinvestment in sustainable practices, thus strengthening food security and community-driven resilience.

D. Describe or provide an analysis of the cost-effectiveness of the proposed project/programme and explain how the regional approach would support cost-effectiveness.

71. The project, with a budget of $13.78 million, demonstrates cost-effectiveness by integrating climate-smart agricultural technologies, capacity building, and regional cooperation to maximize adaptation impact while optimizing resource allocation. The project's design targets climate-induced vulnerabilities in rice farming, such as flooding, droughts, and temperature increases, through high-impact, scalable interventions that reduce long-term costs associated with climate shocks. By focusing on climate-resilient rice varieties, biofertilizers, precision farming tools, and water management systems (Component 1, $5 million), the project will enhance productivity and reduces crop losses, which are critical given the projected 10% yield decline per 1°C temperature rise in the Philippines and up to 60% yield reductions from early-season droughts and floods in Malaysia. These technologies lower operational costs for farmers by

reducing reliance on chemical inputs and improving resource efficiency, ensuring sustained economic benefits. The establishment of Farmer Climate Field Living Labs (Component 2, $3.5 million) will allow farmers to test and adapt these innovations, minimizing the risk of costly maladaptation and ensuring scalable, locally relevant solutions. The project will further enhance cost-effectiveness through strengthened climate intelligence and early warning systems (Component 2), which will enable anticipatory action to mitigate losses from extreme weather events. Impact-based forecasting and water allocation frameworks will reduce financial impacts of floods and droughts, saving farmers and local governments from recurring recovery costs. Institutional capacity building (Component 3, $2.5 million) therefore, ensuring that adaptation strategies are embedded in national policies, reducing the need for future external funding by fostering self-sustaining agricultural systems. The focus on training, particularly for women and marginalized groups, will also enhance social inclusion, amplifying economic returns by empowering under-resourced farmers to contribute to resilient value chains. Similarly, the regional approach will significantly bolster cost-effectiveness by leveraging shared expertise and harmonizing adaptation strategies across Malaysia and the Philippines through a Regional Knowledge Platform (Component 4, $500,000). This platform will facilitate the exchange of best practices, such as climate-resilient rice varieties and biomass utilization techniques, reducing research and development costs by avoiding duplication. For example, Malaysia's expertise in precision farming can benefit the Philippines, while the Philippines' experience with flood-tolerant rice varieties can inform Malaysia's strategies. Joint demonstrations within the BIMP-EAGA framework and collaboration with GEF/GCF-funded projects will ensure that resources are pooled, and successful models are scaled across ASEAN, maximizing impact per dollar spent.

E. Cost-effectiveness of the proposed project

72. The project will demonstrate cost-effectiveness through integration of climate-smart agricultural technologies, capacity building, and regional knowledge-sharing that will lead to maximizing the impact while optimizing resource allocation. The investment in climate-resilient agricultural practices will be a key aspect of its cost-efficiency through introduction of drought- and flood-resistant rice varieties, biofertilizers, precision farming tools, water accounting, and smart irrigation systems. These technologies will assist in increasing productivity while reducing crop losses due to climate shocks. The project will also enhance resource efficiency by reducing long-term operational costs for farmers. By piloting innovations such as the Farmer's Climate Field Living Labs, the project will ensure that farmers are able to test, adapt, and scale up successful climate-smart practices.

73. The project will also enhance cost-effectiveness by strengthening early warning and anticipatory action mechanisms. By improving impact-based forecasting and warning services for the agriculture sector, as well as seasonal and sub-seasonal climate forecast, farmers will be able to better plan their cropping for extreme weather events, reducing financial losses associated with crop failures, and impacts from floods, and droughts. The project will aim to optimize water use by implementing a water accounting and allocation framework to help farming communities in reducing water inefficiencies which is a particularly critical measure in drought-prone areas of Malaysia and the Philippines. Such measures will result in long-term cost savings for farmers and local government departments therefore, ensuring sustainable agricultural productivity.

74. The regional cooperation approach proposed in the project will significantly enhance cost-effectiveness by leveraging shared expertise, appropriately allocating necessary financial resources, and harmonizing adaptation strategies across Malaysia and the Philippines. The project will establish a joint knowledge platform for information exchange and sharing, where both countries can benefit by learning from each other's successful climate adaptation strategies that can be shared, refined, and scaled up. Moreover, the project will also enhance the economic sustainability by strengthening agricultural value chains and fostering regional market integration. Promoting the climate-resilient rice farming, preparation of rice-bran oil, and composting will support diversification of income sources, allowing farmers to look beyond rice yields. Such arrangements will ensure farmers being well protected from climate-induced income instability while providing greater access to regional and international markets for their value-added products. Further, the project will also initiate public-private-partnerships to facilitate access to climate finance and helping smallholder farmers in investing in long-term resilience measures.

F. Project consistency with national or sub-national sustainable development strategies

75. The project aligns well with national and sub-national sustainable development strategies, climate action plans, and food security policies in both Malaysia and the Philippines. Given the significance of rice farming in Malaysia and the Philippines, this project will be able to directly support national objectives related to climate adaptation, poverty reduction, and agricultural resilience. In Malaysia, the project aligns well with the Malaysia National Adaptation Plan (MyNAP) (2023–2026)[39], which highlights agriculture and food security as priority areas for climate resilience. The project's focus on climate-smart agriculture, water-efficient irrigation systems, and early warning systems will contribute to Malaysia's broader national strategy of enhancing agricultural sustainability in view of climate change. Moreover, Malaysia's Climate Change Adaptation Framework for Water Sectors (2021)[40] recognizes the urgent need for innovations in water management in agriculture sector, which the project will directly address through water accounting and allocation systems for rice farmers.

76. For the Philippines, the project aligns appropriately with the Philippines Rice Industry Roadmap 2030[41], which aims to enhance rice productivity, reduce post-harvest losses, and improve climate adaptation strategies in the rice sector. The project's efforts to introduce climate-resilient rice varieties, improve irrigation efficiency, and strengthen early warning systems would contribute to these national goals. Further, the Philippines is ranked 10th in the Global Climate Risk Index as the country most affected by extreme weather events in the last 30 years including rising temperatures, and shifting rainfall patterns, all of which poses a significant threat to rice production[42]. The project will also directly support the Philippine Development Plan (PDP) (2023-2028)[43] that prioritizes climate resilience in agriculture and disaster risk reduction strategies which can be well achieved by integrating impact-based forecasting and warning (IbFW), anticipatory action mechanisms, and climate-smart extension services. The project will ensure that institutional and technological capacity needed to safeguard the country's food security is strengthened.

77. At a broader level, the project will also contribute to the ASEAN Climate Resilience Network (ACRN)[44] that promotes regional collaboration on climate adaptation and sustainable agriculture. As both Malaysia and the Philippines are ASEAN Member States (AMS), the project can be a good example towards supporting the region's strategic goals for food security and climate resilience, including those outlined in the Action Plan for Sustainable Agriculture in ASEAN[45]. The project also aligns with the ASEAN Guidelines on Promoting Climate-Smart Agriculture Practices (2021)[46] that emphasizes on regional cooperation, technology transfer, and capacity-building of farmers, all of which are key components of this initiative. The project is in good shape towards contributing to the ASEAN Vision 2040[47] through South-South cooperation that emphasizes regional sustainability, climate action, and economic integration to achieve long-term food security.

78. Beyond regional frameworks, the project also aligns well with global commitments such as the United Nations Sustainable Development Goals (SDGs)[48], particularly SDG 2 (Zero Hunger)[49], SDG 13 (Climate Action)[50], and SDG 17 (Partnerships for the Goals)[51]. The project's emphasis on climate-resilient rice farming, institutional capacity-building, and regional cooperation will contribute significantly to these global objectives by ensuring sustainable food production systems, strengthening resilience to climate change, and enhancing international partnerships for knowledge-sharing and capacity development. The project will

[39] https://napglobalnetwork.org/2025/01/malaysia-sets-course-enhance-resilience-formulation-inclusive-nap/
[40] https://people.utm.my/vani/2021/06/10/climate-change-adaptation-framework-for-water-sector/
[41] https://www.philrice.gov.ph/wp-content/uploads/2018/09/The-Philippine-Rice-Industry-Roadmap-2030.pdf
[42] https://www.germanwatch.org/sites/default/files/2025-02/Climate%20Risk%20Index%202025.pdf
[43] https://pdp.neda.gov.ph/wp-content/uploads/2023/01/PDP-2023-2028.pdf
[44] https://asean-crn.org/
[45] https://asean.org/wp-content/uploads/2024/11/Action-Plan-for-Sustainable-Agriculture__.pdf
[46] https://asean.org/wp-content/uploads/2022/10/2023_ASEAN-Guidelines-on-the-Promotion-of-CSA-Practices-Vol-3_adopted.pdf
[47] https://asean.org/wp-content/uploads/2021/08/ASEAN-Vision-2040-Volume-1.pdf
[48] https://sdgs.un.org/goals
[49] https://sdgs.un.org/goals/goal2
[50] https://sdgs.un.org/goals/goal13
[51] https://sdgs.un.org/goals/goal17

follow the guidelines set by the Paris Agreement and the IPCC's Sixth Assessment Report (AR6) by ensuring that adaptation measures are equitable, ecosystem-based, and aligned with long-term sustainability goals.

79. Overall, the project tends to integrate national, regional, and global strategies for climate resilience, food security, and sustainable agriculture. By aligning with existing policies, development plans, and adaptation frameworks, the project will ensure that its interventions are well-supported, scalable, and sustainable within the broader climate and development agendas of Malaysia, and the Philippines, including the ASEAN region.

G. Project's alignment with relevant national technical standards and complies with the Environmental and Social Policy of the Adaptation Fund.

80. The project will fully align with relevant national technical standards and regulatory frameworks governing environmental protection, agricultural sustainability, and climate adaptation in both countries. Given that the project focus is on climate-smart agriculture (CSA), water management, and infrastructure development, it will amply comply with Malaysia's and the Philippines' environmental and agricultural regulations, as well as international best practices. In Malaysia, the project will adhere to the Environmental Quality Act (1974)[52], which mandates environmental impact assessments (EIAs) for projects that could affect natural resources, biodiversity, and land use. Similarly, in the Philippines, the project will align with the Environmental Impact Statement (EIS) System under Presidential Decree No. 1586[53], ensuring that all interventions consider environmental risks and mitigation measures.

81. The project will also fully comply with national agricultural standards and food security regulations to ensure that climate-resilient rice farming techniques, irrigation systems, and digital agriculture solutions meet government-approved safety and quality benchmarks. In Malaysia, this will include aligning the project activities with the National Agro-Food Policy (NAP) 2021–2030[54] that promotes sustainable agricultural production, efficient water use, and ecosystem-based adaptation. In the Philippines, the project will comply appropriately with the Philippine Rice Industry Roadmap 2030, which sets technical guidelines for climate-resilient rice farming, seed certification, and sustainable land use. The introduction of drought- and flood-resistant rice varieties, biofertilizers, and precision farming tools will be guided by national agricultural research institutions to ensure that new technologies are effective, safe, and environmentally sound.

82. The project will adhere to any building codes and engineering standards as applicable for climate-resilient infrastructure related to irrigation systems, water accounting frameworks, and early warning mechanisms. In Malaysia, the project will follow guidelines from the Department of Irrigation and Drainage (DID) and the Malaysian Standard on Sustainable Infrastructure to ensure that all water-related interventions meet climate resilience and efficiency criteria. In the Philippines, irrigation and flood management systems will be aligned in accordance with the National Irrigation Administration (NIA) guidelines and Building Code of the Philippines, ensuring safety and long-term sustainability. The project's impact-based forecasting and early warning systems (EWS) will comply with World Meteorological Organization (WMO) guidelines on Multi-Hazard Early Warning Systems[55, 56], ensuring that information is accurate, timely, and actionable for farmers.

83. In line with the Environmental and Social Policy (ESP)**Error! Bookmark not defined.** of the Adaptation Fund, the project will conduct a comprehensive environmental and social risk assessment during the implementation phase. Potential risks including land degradation, water resource conflicts, and unintended socio-economic impacts will be identified, monitored, and mitigated through participatory stakeholder engagement. The project will follow the IPCC AR6 framework to avoid maladaptation, ensuring that adaptation measures provide human, ecosystem, and mitigation co-benefits. Special attention will be given to gender and social

[52] https://www.env.go.jp/en/recycle/asian_net/Country_Information/Law_N_Regulation/Malaysia/Malaysia_mal13278.pdf
[53] https://faolex.fao.org/docs/pdf/phi19235.pdf
[54] https://www.kpkm.gov.my/images/04-dasar-agromakanan/national_agrofood_policy_2021-2030_nap%202.0.pdf
[55] https://library.wmo.int/viewer/69085/download?file=Global-Status-of-MHEWS-2024_en.pdf&type=pdf&navigator=1
[56] https://community.wmo.int/en/impact-based-forecast-and-warning-services

inclusion side, ensuring that women, vulnerable communities, and smallholder farmers have equal access to resources, training, and decision-making opportunities. The project will also fully align with relevant international and national standards such as food safety standards in Malaysia and the Philippines.

H. Duplication of project with other funding sources.

84. The project has been carefully designed to complement and build upon existing climate adaptation initiatives, avoiding any duplication with other funding sources while enhancing synergies with ongoing projects. During the project formulation stage, we will closely align with Malaysia's National Adaptation Plan (MyNAP) (2023–2026) that prioritizes agriculture and food security as critical sectors for climate adaptation. The project will work with concerned national agencies in Malaysia and the Philippines to ensure that interventions add value to existing efforts rather than replicating them. The agencies have already expressed support for the proposed project and are ready to participate in detailed consultations to refine project strategies, identify gaps, and ensure alignment with national adaptation goals. This proposed project will connect and learn from projects funded by the Adaptation Fund and GEF in these countries and the Asia region[57].

85. In Malaysia, the project will integrate lessons and best practices from other climate resilience initiatives, particularly those funded by the Adaptation Fund and the Global Environment Facility (GEF). The project will also coordinate with existing GEF-funded initiatives focused on agriculture, water management, and climate-smart practices to leverage knowledge and maximize impact. For instance, Malaysia has ongoing programs under GEF's Climate Resilient Agriculture Framework, which support sustainable farming techniques, ecosystem-based adaptation, and policy strengthening. By aligning with these initiatives, our project will ensure that the interventions are complementary, and can benefit from existing research, policy recommendations, and pilot experiences in climate adaptation.

86. Similarly, in the Philippines, the project will connect and learn from Adaptation Fund supported initiatives, particularly the GCF-funded "Adapting Philippine Agriculture to Climate Change[58]" project. This initiative is already working on climate services, farmer training, and risk-informed decision-making, making it a valuable reference point for strengthening our proposed project's extension services, early warning systems, and climate intelligence platforms. Therefore, our project will build on existing research, technologies, and stakeholder networks to scale up successful adaptation strategies in new target regions. Moreover, the project will also ensure complementarity with national efforts, such as the Philippine Rice Industry Roadmap 2030 and the Department of Agriculture's climate resilience programs, which focus on agroecology, resilient seed varieties, and digital innovation in farming.

87. The Regional Knowledge Platform to be established under this project will serve as a central hub for information-sharing, enabling better coordination between existing and new adaptation efforts in the region while ensuring that there exists continuous dialogue with other climate resilience initiatives in Southeast Asia. The project will also try to maximize efficiency, reduce redundancy, and create a more cohesive regional adaptation strategy. Overall, the project has been designed strategically to avoid duplication with existing funding sources and initiatives while ensuring a strong coordination and knowledge-sharing with the Adaptation Fund itself, GEF, and other climate resilience programs in Malaysia, and the Philippines, and other ASEAN countries.

I. Learning and knowledge management component to capture and disseminate lessons learned.

88. The overall project incorporates a strong learning and knowledge management component to ensure that best practices, innovative adaptation strategies, and lessons learned are effectively captured, shared, and scaled up. A key mechanism is the establishment of a Regional Knowledge Platform for South-South

[57] In the Philippines, UNIDO is conducting the project formulation of a project, Harnessing the water-energy-food nexus to address and adapt to climate change impacts in Tawi-Tawi. The proposed project will be implemented by UNIDO and Mindanao Development Authority. In Malaysia, the UNHABITAT implements a project, Nature-based Climate Adaptation Programme for the Urban Areas of Penang Island. The project implements solely on the Penang Island.
[58] https://www.greenclimate.fund/project/fp201

Cooperation, which will serve as a platform for information sharing and exchange, policy discussions, and regional collaborations on climate-resilient rice farming. This platform will also facilitate the documentation and dissemination of regional best practices, policy recommendations, and project outcomes ensuring that lessons from Malaysia and the Philippines can inform similar efforts across Southeast Asia. Furthermore, the project will also support joint research initiatives, farmer exchanges, and digital knowledge-sharing tools allowing farmers, policymakers, and technical experts to access and apply relevant insights in real time.

89. To further strengthen knowledge management, the project will integrate Farmer's Climate Field Living Labs as centers for experiential learning and continuous adaptation. These living labs will document real-world farmer experiences with climate-smart agriculture (CSA) technologies, water management techniques, and digital advisory tools, creating a repository of practical insights for scaling up successful interventions. The project will also organize regional workshops, training sessions, and policy dialogues, allowing stakeholders at different levels from local farming communities to national level decision-makers to exchange knowledge and refine adaptation strategies. The project also intends to develop guidelines, training manuals, and other capacity building materials, making learnings accessible to a wider audience, including smallholder farmers, agricultural extension workers, and climate resilience practitioners. Through these efforts, the project will ensure that its innovations are not only implemented effectively but also replicated and institutionalized for long-term impact.

J. Consultative process undertaken during project preparation

90. The consultative process for the project preparation is designed to ensure broad stakeholder engagement at regional, national, and community levels, particularly emphasizing the inclusion of vulnerable groups such as female-led households, smallholder farmers, and other indigenous communities. The consultation process was structured to capture diverse perspectives, validate project design, and ensure proper alignment with local needs and national adaptation priorities. At the national level, discussions focused on engaging appropriately with government agencies, agricultural research institutions, private sector representatives, and farming communities to gather stakeholder input on policy alignment, investment needs, and technical support for climate-smart agriculture. In Malaysia, key stakeholders include the Department of Agriculture, the Malaysian Bioeconomy Development Corporation, Malaysian Agricultural Research and Development Institute (MARDI), and the Ministry of Natural Resources, Environment and Climate Change (NRECC). In the Philippines, the consultations involve the Department of Agriculture (DA), the Philippine Rice Research Institute (PhilRice), the National Irrigation Administration (NIA), and relevant climate resilience programs under the Department of Environment and Natural Resources (DENR). These national-level agencies were identified and discussions were carried out to validate the project's technical approach, assess potential environmental and social impacts, and strengthen institutional coordination for long-term sustainability.

91. As part of project preparation, a series of targeted consultations were conducted in both Malaysia and the Philippines with the aim to integrate local knowledge and climate-responsive adaptation strategies. The overall consultations were carried out in two series, (a) initial consultations and (b) validation workshops. During the initial consultations which was carried out in August 2024, stakeholders from Malaysia includes participants from the Bioeconomy Corporation, MUDA Agricultural Development Authority (MADA), Northern Corridor Economic Region, Universiti Teknologi MARA and the farming community. Similarly, the consultations in the Philippines held in January – February 2025, involved participants from Government both at the regional and provincial levels and also the farming communities. During the consultations, discussions focus around (a) awareness on climate change and its impacts on paddy cultivation (b) understanding their mitigation strategy (c) Malaysian governments role in providing subsidies or incentives. Key point and their recommendations were identified during the discussions which were then used to further refine the project concept. The refined concept was then validated through validation workshops held in both Malaysia and the Philippines in February 2025 respectively and attended by different stakeholders where the views and consent were taken to advance the concept preparation for final submission.

92. In the Philippines, the validation workshop, held on February 19, 2025, brought together key agencies such as the Philippine Institute for Development Studies (PIDS), International Rice Research Institute (IRRI), Philippine Center for Postharvest Development and Mechanization (PhilMech), and the Department

of Science and Technology - Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (DOST-PCAARRD). Participants discussed critical issues, including soil quality degradation, increased pesticide tolerance in pests, and insufficient irrigation programs. Stakeholders emphasized the need for integrated pest management, farmer field schools, and improved irrigation planning. Specific recommendations included mainstreaming climate-resilient rice varieties, strengthening crop insurance mechanisms, and integrating farmers into the agricultural value chain. The workshop also highlighted gender considerations, with discussions on how women farmers can be better integrated into climate adaptation initiatives through training and financial support.

93. Similarly, in Malaysia, the validation workshop, held on February 25, 2025, engaged national agencies such as the Ministry of Agriculture & Food Security (KPKM), Malaysian Agricultural Research and Development Institute (MARDI), Ministry of Natural Resources and Environmental Sustainability (NRES), and the Muda Agricultural Development Authority (MADA). Discussions focused on site selection for project implementation, crop insurance mechanisms, and farmer acceptance of new rice varieties. Stakeholders emphasized the need to align the project with Malaysia's National Adaptation Plan (MyNAP) and ensure the inclusion of smallholder farmers in technology transfer initiatives. MARDI provided insights on drought- and flood-resistant rice varieties currently in development, suggesting that the project could support their scaling and adoption. Malaysia's National Climate Center also agreed to provide historical weather data and projections to strengthen the project's climate risk assessments.

K. Justification for funding requested, focusing on the full cost of adaptation reasoning.

94. The project seeks $13.78 million in funding to address the cost of adaptation in rice farming communities facing increasing climate risks. The project is designed to provide transformational, long-term adaptation benefits for smallholder farmers in Malaysia and the Philippines, ensuring that vulnerable communities can cope with climate variability, extreme weather events, and long-term environmental changes. Given that climate change directly impacts rice production in both countries, the requested funding will ensure that farmers are well equipped with climate-smart agricultural technologies, risk management tools, and institutional support mechanisms to enhance their resilience and food security. The funding requested is based on the full cost of adaptation approach and ensuring that climate adaptation is comprehensive, inclusive, and sustainable.

95. Component 1: Medium and large-scale climate-smart agricultural technologies and practices deployed through public-private partnerships to increase and diversify production, and to build the resilience of rice farming communities (Allocated amount: $5 million).

A significant portion of the funding is allocated to deploy medium- and large-scale climate-smart agricultural technologies and practices to improve rice production and build community resilience. This will include the introduction of climate-resilient rice varieties, biofertilizers, digital precision farming tools, and climate-smart irrigation systems. With rice yields reducing due to rising temperatures and erratic rainfall patterns, these investments are necessary to offset the impacts of climate change and ensure stable production levels. This component will target climate-induced vulnerabilities through adaptation-specific interventions, such as submersible rice varieties for flood-prone areas and drought-resistant varieties for arid regions. The adaptation funding would help farmers reduce yield losses by integrating adaptation interventions thereby maintaining a balanced food security and economic stability in both countries.

96. Component 2: Strengthened integrated information & climate intelligence for farmers and institutions (Allocated amount: $3.5 million).

Climate adaptation will require a robust climate intelligence and early warning mechanisms to enable anticipatory action and risk-informed decision-making. The requested funding will support the development of impact-based forecasting, seasonal to sub-seasonal climate advisory services, and an improved data collection system for localized climate risk assessment. Without such investments, farmers will lack the critical information needed to prepare for climate extremes, resulting in crop losses and inefficient resource allocation. The funding will also support the development of a water accounting and allocation system, therefore ensuring efficient water management in the face of increasing drought risks. Since climate-

induced water shortages and erratic rainfall patterns threaten rice production, these adaptation interventions will help integrate real-time climate data with water management practices. The cost of adaptation will include installing weather monitoring infrastructure, developing digital tools for climate advisories, and training extension officers to interpret and disseminate early warnings to farming communities. Such investment will help farmers and institutions to equipped well to respond to climate variability and climate-related economic losses.

97. Component 3: Institutional capacity building for localized adaptation strategies to create enabling environment for investments in Agriculture Marketing Services (Allocated amount: $2.5 million).

Institutional capacity-building is a key component of adaptation, ensuring that local, provincial, and national governments have the knowledge, tools, and policies to support climate-resilient agriculture. The requested funding will enable training programs for government staff and policymakers on climate-smart agriculture, risk reduction strategies, and financial mechanisms for adaptation. This component will also empower vulnerable farmer groups especially female farmers and smallholder farmers to manage climate and market risks by facilitating access to climate finance and strengthening value chain linkages. These interventions will allow adaptation policies and programs to be well integrated to support smallholder farmers towards long-term resilience. Given that women farmers often have less access to resources and decision-making power, this funding will also support gender-responsive adaptation strategies by ensuring that adaptation efforts are inclusive and equitable. The cost of adaptation here includes technical training, policy development, and strengthening coordination mechanisms between agricultural institutions and climate agencies.

98. Component 4: Regional Knowledge Platform for South-South Cooperation (Allocated amount: $500,000).

The requested funding will support the establishment of a Regional Knowledge Platform, allowing both Malaysia and the Philippines to share best practices, research findings, and adaptation strategies with other countries facing similar climate challenges. This will ensure that adaptation measures are continuously improved, scaled, and replicated through regional cooperation. This component will also leverage South-South cooperation to enhance regional climate resilience. The funding will cover workshops, policy dialogues, and knowledge-sharing mechanisms which will ensure that adaptation solutions are widely disseminated and sustainably adopted across the ASEAN region.

99. Justification for the Full Cost of Adaptation Approach:

The overall funding requested is fully justified under the full cost of adaptation reasoning, as the interventions identified in the project are specifically designed to address climate change risks which will go beyond regular agricultural development activities. The project will not replace any existing agricultural programs but rather will fill the critical gaps in adaptation funding, ensuring that farmers and institutions can effectively respond to climate risks that would bring stability to their livelihoods.

The $13.78 million Adaptation Fund (AF) allocation for the project is sufficient to achieve its outcomes and objectives, ensuring enhanced climate resilience without reliance on additional or external funding. The budget is strategically allocated across four components: $5 million for climate-smart agricultural technologies (Component 1), $3.5 million for climate intelligence (Component 2), $2.5 million for institutional capacity building (Component 3), and $0.5 million for a regional knowledge platform (Component 4), with $1.2 million for execution costs and $1.079 million for management fees. These funds fully cover activities such as deploying climate-resilient rice varieties, biofertilizers, and precision farming tools (Component 1), establishing Farmer Climate Field Living Labs, early warning systems, and water allocation frameworks (Component 2), training farmers and policymakers (Component 3), and creating a regional knowledge hub (Component 4). By leveraging existing research from institutions like MARDI and PhilRice, public-private partnerships, and regional networks like ASEAN, the project optimizes resources, ensuring cost-effective, scalable interventions that address climate risks like floods, droughts, and temperature increases, aligning with AF's Results Framework (e.g., Outcomes 4, 6, 7, 8). The project's design also ensures sustainability

and alignment with AF's Environmental and Social Policy (ESP), with all activities tailored to deliver long-term resilience within the allocated budget. Components 1 and 2 will directly enhance farmers' adaptive capacity through demonstration sites and climate intelligence platforms, while Component 3 will embed adaptation strategies into national policies (e.g., Malaysia's MyNAP, Philippines' Rice Industry Roadmap 2030), ensuring institutional continuity. Component 4's knowledge platform, utilizing digital tools and existing BIMP-EAGA frameworks, will help maximize regional impact at minimal cost. The comprehensive monitoring, evaluation, and learning (MEL) framework, funded within execution costs, will support adaptive management, while low/no risk ratings across AF's 15 ESP principles will minimize the need for additional safeguards. By integrating local expertise, scalable technologies, and stakeholder engagement, the project will ensure that its objectives of improving food security, supporting marginalized farmers, and fostering inclusive adaptation are fully achievable within AF resources, delivering sustainable resilience for rice farming communities.

L. Sustainability of the project outcomes

100. The sustainability of the project has been carefully embedded into its design by ensuring strong institutional partnerships, long-term capacity building, and integration with national policies and adaptation plans in both Malaysia and the Philippines. A key element of sustainability will be the collaboration between research and development (R&D) institutions and government agencies, particularly PhilRice in the Philippines and MARDI in Malaysia. They will be the agencies who will co-host the Farmer's Climate Field Living Labs. These living labs will serve as knowledge hubs, allowing farmers to continuously test and adopt climate-smart agriculture (CSA) practices, precision farming tools, and resilient rice varieties beyond the project's implementation period. Therefore, by working closely with the Ministry of Agriculture & Food Security (KPKM) in Malaysia and the Department of Agriculture (DA) in the Philippines, the project will ensure that its strategies on climate-smart agriculture, resilient infrastructure, and climate intelligence are well integrated into national and sub-national adaptation frameworks, thereby ensuring institutional ownership and continuity.

101. To further enhance sustainability, the project will also incorporate capacity-building measures for farmer cooperatives, focusing on management, financial planning, and market integration. The training programs will help equip smallholder farmers, especially women-led farming groups, with the skills to access climate finance, optimize input use, and reinvest profits into sustainable agricultural practices. Moreover, the project will also leverage the lessons learned from GEF-funded regional initiatives and ensuring that best practices from other adaptation programs are mainstreamed into national policies and extension services. Establishing regional cooperation through the knowledge platform, both Malaysia and the Philippines will benefit from research exchanges, successful scaling up of adaptation models, and coordinated investments that will help the rice sector in achieving resilience beyond the project's duration.

M. Overview of the environmental and social impacts and risks identified

102. To ensure the project does not inadvertently cause any social or environmental harm, all activities under the project will be reviewed in line with the Adaptation Fund's Environmental and Social Policy , as well as UNIDO's Environmental and Social Safeguard Policies (ESSPP) . The project will take proactive measures to avoid maladaptation, following the IPCC 6th Assessment Report framework in order to ensure that adaptation interventions are equitable, effective, and provide human, ecosystem, and mitigation co-benefits. Time and resources will also be allocated to identify potential maladaptation risks throughout project implementation stage, and necessary adjustments will be made to mitigate any unintended impacts. Similarly, the Climate Living Lab will play an important role in minimizing maladaptation risks and ensuring that newly introduced technologies and practices are sustainable and beneficial to all farmers, particularly the most vulnerable groups. The project will also develop a gender baseline and social inclusion strategy to prevent any kind of gender and social exclusion, therefore ensuring that women, youth, and marginalized communities are actively engaged in the decision-making process, training programs, and financial mechanisms. Such safeguard mechanisms will be sustainable, inclusive, and climate-resilient agricultural development together with empowering the most vulnerable communities in Malaysia and the Philippines.

103. The project has undergone preliminary environmental and social risk screening during the concept preparation phase, aligning with the 15 Adaptation Fund (AF) principles and UNIDO's Environmental and Social Safeguard Policies (ESSPP) to identify potential environmental and social risks and impacts. The consultative process too has identified key environmental and social risks that may be associated with the project and which will be further assessed and mitigated during project implementation. One of the primary concerns identified during the concept development phase is the lack of a comprehensive national policy on climate adaptation for the rice sector, which may slow down the process of adoption of climate-smart agriculture (CSA) practices and resilient farming policies. Delays in paddy and rice intervention strategies such as the introduction of climate-resilient rice varieties, expansion of sustainable irrigation infrastructure, and optimization of water management frameworks could impact the project's ability to achieve long-term agricultural resilience.

104. On the environmental side, potential risks may include overuse of fertilizers and pesticides that could lead to soil degradation, water contamination, and biodiversity loss, if not properly addressed. To mitigate these risks, the project will have to promote integrated pest management (IPM), sustainable soil fertility practices, and eco-friendly inputs through the Farmer's Climate Field Living Labs. Another challenge identified is the disruptions in logistics related to extreme weather events, which could delay the distribution of climate-resilient inputs, implementation of early warning systems, and infrastructure development. The project will incorporate adaptation strategies which are flexible considering market uncertainties and environmental policy delays, therefore ensuring that interventions remain relevant and responsive to emerging climate risks. Furthermore, a gender baseline will be developed that will ensure inclusion of women farmers and vulnerable groups in decision-making as well as getting benefits from adaptation measures.

Table 4: Project compliance in line with Adaptation Fund Environmental and Social Principles

Checklist of environmental and social principles[59]	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
Compliance with the Law	X	**Low / No Risk:** The proposed project is developed in close collaboration with the governments of Malaysia and the Philippines, ensuring strict compliance with relevant laws and regulations, thereby reducing the risk level associated with this ESP. The project will ensure that all local laws are well adhered to and complied accordingly.
Access and Equity	X	**Low / No Risk:** The project will prioritize full transparency and accountability during its design and implementation stage as it aims to mitigate any adverse impacts on individuals, ensure their rights are protected, and maintain a low/no risk level in terms of access and equity.
Marginalized and Vulnerable Groups	X	**Low / No Risk:** The project will ensure compliance with the Adaptation Fund Environmental and Social Policy (ESP) checklist by actively identifying and engaging marginalized and vulnerable groups through inclusive consultations and social assessments. It will promote equitable access to project benefits by implementing targeted interventions, such as tailored capacity-building programs, financial inclusion, and access to climate-resilient resources. Measures will be in place to prevent displacement, discrimination, or exclusion while ensuring that these groups have meaningful participation in decision-making. The project will also put in place

[59] https://www.adaptation-fund.org/wp-content/uploads/2016/07/ESP-Guidance_Revised-in-June-2016_Guidance-document-for-Implementing-Entities-on-compliance-with-the-Adaptation-Fund-Environmental-and-Social-Policy.pdf

Checklist of environmental and social principles[59]	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
		mechanisms to address concerns transparently, ensuring social safeguards are upheld throughout project implementation.
Human Rights	X	**Low / No Risk:** This project is committed to upholding the rights of all individuals and does not violate any fundamental human rights principles or pillars
Gender Equity and Women's Empowerment	X	**Low / No Risk:** The project will ensure compliance on Gender Equity and Women's Empowerment by promoting equal participation of women in all project activities and decision-making processes. A gender analysis will be conducted to identify barriers and opportunities for women's engagement, ensuring that project benefits are equitably distributed. Targeted interventions, such as capacity-building programs, access to financial resources, and leadership opportunities, will empower women to actively contribute to climate adaptation. The project will also integrate gender-sensitive indicators to monitor progress and to address any gender-related concerns, ensuring an inclusive and gender-responsive approach throughout implementation.
Core Labour Rights	X	**Low / No Risk:** To ensure compliance with the Adaptation Fund's Environmental and Social Policy (ESP) regarding Core Labour Rights, the project will adhere to the core labour standards as identified by the International Labour Organization (ILO)[60]. These standards encompass the elimination of forced and compulsory labour, the abolition of child labour, the elimination of discrimination in respect of employment and occupation, and the freedom of association and the right to collective bargaining. By integrating these principles, the project will promote fair treatment, non-discrimination, and equal opportunity for all workers involved. Regular monitoring and reporting mechanisms will be established to ensure adherence to these labour standards throughout the project's implementation.
Indigenous Peoples	X	**Low / No Risk:** The project will comply by ensuring their full and effective participation in all stages of project design, implementation, and monitoring. A Free, Prior, and Informed Consent (FPIC) process will be conducted to respect their rights, traditions, and cultural heritage. The project will integrate indigenous knowledge and practices into climate adaptation strategies while safeguarding their land, resources, and livelihoods.
Involuntary Resettlement	X	**Low / No Risk:** The project has no plans for any resettlement.
Protection of Natural Habitats	X	**Low / No Risk:** The project will fully comply on Protection of Natural Habitats by ensuring that all activities avoid adverse impacts on critical ecosystems and biodiversity.

[60] https://www.ilo.org/international-labour-standards

Checklist of environmental and social principles[59]	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
		The project will promote sustainable land-use practices through climate-smart agricultural practices.
Conservation of Biological Diversity	X	**No Risk:** There will not be any impact on biodiversity in the project piloted areas.
Climate Change		**Low Risk:** The project will comply with the Adaptation Fund Environmental and Social Policy (ESP) on Climate Change by ensuring that all activities contribute to climate resilience and do not exacerbate greenhouse gas (GHG) emissions. The project will promote low-carbon, climate-smart practices, nature-based solutions, and sustainable resource management practices. It will align with national climate policies and commitments under the Paris Agreement to enhance adaptive capacity and mitigation co-benefits.
Pollution Prevention and Resource Efficiency		**Low / No Risk:** The project will comply fully on Pollution Prevention and Resource Efficiency by adopting sustainable practices that minimize pollution and optimize resource use. The project will prioritize low-carbon technologies, sustainable land and water management, and eco-friendly materials to limit environmental impacts.
Public Health	X	**Low Risk:** No adverse impact on public health related issues is envisaged.
Physical and Cultural Heritage	X	**Low Risk:** There is a low probability that the project will be implemented in areas considered to hold archaeological (prehistoric), paleontological, historical, cultural, artistic, or religious value, or areas containing features considered critical cultural heritage. If this were to happen, the consequence would be low
Lands and Soil Conservation	X	**Low/No Risk:** The project will promote sustainable land management practices at national and farm level.

PART III: IMPLEMENTATION ARRANGEMENTS

105. The project will be implemented through a multi-stakeholder approach involving international organizations, national governments, research institutions, and local partners to ensure effective execution, coordination, and long-term sustainability.

106. The project will be implemented by the United Nations Industrial Development Organization (UNIDO), which will serve as the Implementing Entity. UNIDO will be responsible for several key aspects of the project, including overall project coordination and oversight to ensure alignment with the Adaptation Fund's objectives and national adaptation priorities. It will also manage financial aspects, ensuring transparency and accountability in the utilization of funds. As an implementing agency, it will provide technical support and capacity building, offering guidance on climate-smart agriculture (CSA), facilitating knowledge exchange, and strengthening institutional capacities. Moreover, UNIDO will oversee the monitoring, evaluation, and learning (MEL) processes to assess project progress, identify challenges, and incorporate adaptive management strategies.

107. The project will be executed by national entities in Malaysia and the Philippines, ensuring that interventions are locally driven and aligned with national policies.

108. **In Malaysia**, the Malaysian Bioeconomy Development Corporation (Bioeconomy Corporation) will lead the execution of Component 1 (Climate-Smart Agricultural Technologies and Practices) and Component 3 (Institutional Capacity Building for Adaptation Investments). Bioeconomy Corporation will collaborate closely with several key partners to ensure the success of these components. The Muda Agricultural Development Authority (MADA) will focus on implementing climate-smart agriculture (CSA) technologies and supporting climate-resilient rice farming in targeted regions. The Kemubu Agricultural Development Authority (KADA) and Integrated Agricultural Development Areas (IADA) will work on strengthening irrigation systems, improving water management, and enhancing farmer extension services. The Malaysian Agricultural Research and Development Institute (MARDI) will conduct studies on climate-resilient rice varieties, precision water management techniques, biofertilizers, and soil health management. It plans field verification and upscaling trials of drought- and flood-tolerant rice varieties in the period 2028–2030, which would allow alignment of field implementation activities under the proposed project. The Department of Agriculture (DOA) Malaysia will provide technical support and assist with policy integration for climate adaptation in rice production. Lastly, the Ministry of Natural Resources and Environmental Sustainability (NRES) will support environmental monitoring and the integration of adaptation measures into Malaysia's National Adaptation Plan (MyNAP 2023–2026).

109. **In the Philippines**, UNIDO will lead the execution of Component 1 and Component 3, in close collaboration with the department of Agriculture and collaborating closely with several key partners to ensure the successful implementation of these components. The Department of Agriculture Office (DA-CRAO and the MINSANAO development Authority (MinDA) will be the main partners in the Philippines who will serve as the focal points in charge of gathering the relevant stakeholders for the project. The department of Agriculture has several offices that can be engaged to co-host the Farmer's Climate Field Living Labs, offering training on climate-smart agriculture (CSA) techniques and supporting the development of climate-resilient rice varieties. This will be determined during the course of project preparation. The International Rice Research Institute (IRRI) can be engaged to conduct trials on drought-resistant, flood-tolerant, and low-GHG-emission rice varieties, while also facilitating technology transfer. The National Irrigation Administration (NIA) as the main government agency in charge of irrigation can be engaged to oversee the implementation of climate-smart irrigation infrastructure and improvements in water management. The Department of Science and Technology – PAGASA will be engaged to provide climate intelligence, impact-based forecasting, and early warning systems to support farmers. Lastly, the Department of Environment and Natural Resources (DENR) will be engaged to ensure that the project aligns with environmental regulations and integrates ecosystem-based adaptation strategies.

Regional Execution of Climate Intelligence and Knowledge Sharing

110. The Asian Disaster Preparedness Center (ADPC) will be responsible for executing two key components of the project. For Component 2, "Strengthened Integrated Information & Climate Intelligence for Farmers and Institutions," ADPC will oversee the development of early warning systems, digital climate advisory services, and impact-based forecasting in collaboration with PAGASA in the Philippines and NAHRIM in Malaysia. Similarly, for Component 4, "Regional Knowledge Platform for South-South Cooperation," ADPC will establish a platform to facilitate regional collaboration, exchange best practices, and promote South-South learning on climate-resilient rice production.

111. As part of the project execution function (not under the fee for IE acting as part of te EE) UNIDO will lead the execution of the project mid –term and a final independent evaluation which will be conducted as per UNIDO and the AF requirements and standards. The independent project evaluation will support learning, continuous improvement and accountability, and provides factual information about result and practices. In addition, ADPC will be responsible for supporting the project with a gender specialist and an environment and social (E&S) safeguards, specialist in charge of respectively mainstreaming gender concerns and E$S requirements during the implementation phase as well as Environment and Social

safeguards. UNIDO will also be responsible for project monitoring tand day to day PMU management as required.

Governance and Oversight: Project Steering Committee (PSC)

112. A Project Steering Committee (PSC) will be set up at the regional level to provide strategic oversight, risk adaptation, and performance monitoring throughout the project. The PSC will ensure that the project aligns with national policies and regional adaptation frameworks, facilitating coordination between Malaysia and the Philippines to avoid duplication of efforts. It will also address implementation challenges, ensuring effective resource allocation. The PSC will also support regional cooperation by engaging with the ASEAN and other South-South initiatives, fostering collaboration and sharing of knowledge and resources.

The PSC will include representatives from:

- UNIDO (Implementing Entity)
- ADPC (Regional Climate Resilience Lead)
- Bioeconomy Corporation (Malaysia - National Execution Lead)
- Department of Agriculture, Philippines (National Execution Lead)
- MARDI (Malaysia - Research & Climate-Resilient Rice Development)
- PhilRice & IRRI (Philippines - Farmer Training & CSA Research)
- PAGASA & NAHRIM (Climate Intelligence & Forecasting)
- Relevant Ministries (Agriculture, Environment, and Natural Resources from both countries)

Monitoring, Evaluation, and Learning (MEL) Framework

113. To assess adaptation effectiveness and document lessons learned, a comprehensive monitoring and evaluation process will be implemented. This will include periodic progress reports from the executing entities, an annual project performance report from the implementing entity, and field evaluations coupled with farmer feedback mechanisms through the Farmer Climate Field Living Labs. Moreover, annual Project Steering Committee (PSC) review meetings will be held to assess challenges and refine strategies. The process will be further supported by regional knowledge-sharing workshops aimed at disseminating insights across ASEAN, promoting collaboration and the exchange of best practices.

114. The overall implementation process will ensure a multi-level governance approach, leveraging international expertise, national leadership, and local execution capacity. Through regional coordination, public-private partnerships, and institutional capacity building, the project will try to achieve a long-term climate resilience and food security for rice farming communities in Malaysia and the Philippines.

Demonstrate how the project/programme aligns with the Results Framework of the Adaptation Fund[61]

Table 5: Aligning the project with the Results Framework of Adaptation Fund

Project Objective(s)	Project Objective Indicator(s)	Fund Outcome	Fund Outcome Indicator(s)	Project Outcome(s)	Project Outcome Indicator(s)	Fund Output	Fund Output Indicator(s)
Address the climate change impact on food security	Number of farmers adopting climate-resilient agricultural practices	**Outcome 6**: Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas	**6.2** Percentage of targeted population with sustained climate-resilient alternative livelihoods	**Outcome 6.1**: Increased adaptive capacity of communities to respond to climate change	**6.1.1** Percentage of households and communities implementing climate adaptation measures	**Output 6.1**: Targeted individual and community livelihood strategies strengthened in relation to climate change impacts	**6.1.2** Number of community-based adaptation actions implemented
	Increase in agricultural yield despite climate variability	**Outcome 4**: Increased adaptive capacity within relevant development sector services and infrastructure assets	**4.1** Responsiveness of development sector services to evolving needs from changing and variable climate	**Outcome 4.1**: Strengthened resilience of food production systems	**4.1.1** Number of climate-smart rice varieties and technologies	**Output 4.1**: Vulnerable development sector services and infrastructure assets strengthened in response to climate change impacts	**4.1.2** No. and type of development sector services modified to respond to new conditions resulting from climate variability and change
	Number of policies or strategies influenced to integrate climate adaptation	**Outcome 7**: Improved policies and regulations that promote and enforce resilience measures	**7.2** Number of targeted development strategies with incorporated climate change priorities enforced	**Outcome 7.1**: Improved policy support for climate adaptation in agriculture	**7.1.1** Number of local institutions engaged in climate adaptation planning	**Output 7.1**: Improved integration of climate-resilience strategies into country development plans	**7.1.2** No. of policies introduced or adjusted to address climate change risks

[61] https://www.adaptation-fund.org/wp-content/uploads/2019/10/Adaptation-Fund-Strategic-Results-Framework-Amended-in-March-2019.pdf

Project Objective(s)	Project Objective Indicator(s)	Fund Outcome	Fund Outcome Indicator(s)	Project Outcome(s)	Project Outcome Indicator(s)	Fund Output	Fund Output Indicator(s)
Support marginalized rice farmer communities in Malaysia and the Philippines through enhanced extension services	Number of marginalized farmers receiving training and extension services	**Outcome 3**: Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level	**3.2** Percentage of targeted population applying appropriate adaptation responses	**Outcome 3.1**: Improved knowledge and capacity to adapt to climate variability and change	**3.1.1** Number of people trained towards adoption of climate-adaptive farming practices	**Output 3.2**: Strengthened capacity of national and subnational stakeholders to capture and disseminate knowledge	**3.2.1** No. of tools and guidelines developed and shared with relevant stakeholders
	Number of climate-smart agricultural practices disseminated	**Outcome 8**: Support the development and diffusion of innovative adaptation practices, tools, and technologies	**8.1** No. of innovative adaptation practices, tools, and technologies accelerated, scaled-up, and/or replicated	**Outcome 8.1**: Improved institutional support for climate-adaptive farming practices	**8.1.1** Number of people trained in climate adaptation techniques	**Output 8**: Viable innovations are rolled out, scaled up, encouraged, and/or accelerated	**8.2** No. of key findings on effective, efficient adaptation practices, products, and technologies generated
Enhance rice farmers' adaptation capacity through community-level agricultural climate adaptation plans	Number of community-led adaptation plans developed and implemented	**Outcome 2**: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses	**2.1** Capacity of staff to respond to, and mitigate impacts of, climate-related events from targeted institutions increased	**Outcome 2.1**: Strengthened institutional capacity and local governance for climate adaptation	**2.1.1** Number of communities with operational adaptation plans	**Output 2.2**: Increased readiness and capacity of national and sub-national entities to directly access and program adaptation finance	**2.2.1** No. of targeted institutions benefiting from the direct access and enhanced direct access modality
Develop socially inclusive localized adaptation strategies	Number of inclusive policies developed	**Outcome 7**: Improved policies and regulations that promote and enforce	**7.1** Climate change priorities are integrated into national development strategy	**Outcome 7.2**: Empowered communities and stakeholders in climate adaptation	**7.2.1** Percentage of women and marginalized groups involved in	**Output 7.2**: Improved integration of climate-resilience strategies into country	**7.2.2** No. of targeted development strategies with incorporated climate change

Project Objective(s)	Project Objective Indicator(s)	Fund Outcome	Fund Outcome Indicator(s)	Project Outcome(s)	Project Outcome Indicator(s)	Fund Output	Fund Output Indicator(s)
		resilience measures		decision-making	adaptation activities	development plans	priorities enforced
	Number of marginalized groups actively participating in climate adaptation planning	**Outcome 3**: Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level	**3.1** Percentage of targeted population aware of predicted adverse impacts of climate change, and of appropriate responses	**Outcome 3.2**: Increased engagement of marginalized groups in adaptation planning	**3.2.1** Number of multi-stakeholder dialogues conducted	**Output 3.1**: Targeted population groups participating in adaptation and risk reduction awareness activities	**3.1.1** No. of news outlets in the local press and media that have covered the topic
Create an enabling environment for investments in the agriculture sector	Number of new investments in climate-resilient agriculture	**Outcome 6**: Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas	**6.1** Percentage of households and communities having more secure access to livelihood assets	**Outcome 6.2**: Increased resilience of agricultural value chains to climate risks	**6.2.1** Number of businesses or enterprises integrating climate resilience strategies	**Output 6.2**: Targeted individual and community livelihood strategies strengthened in relation to climate change impacts	**6.2.2** Type of income sources for households generated under climate change scenario
	Amount of funding mobilized for climate-smart agriculture	**Outcome 7**: Improved policies and regulations that promote and enforce resilience measures	**7.1** Climate change priorities are integrated into national development strategy	**Outcome 7.3**: Increased financial support for climate-resilient agricultural investments	**7.3.1** Volume of climate-resilient agricultural products in the market	**Output 7.3**: Improved integration of climate-resilience strategies into country development plans	**7.3.2** No. of targeted development strategies with incorporated climate change priorities enforced

PART IV: ENDORSEMENT BY GOVERNMENTS AND CERTIFICATION BY THE IMPLEMENTING ENTITY

A. Record of endorsement on behalf of the government[62] *Provide the name and position of the government official and indicate date of endorsement for each country participating in the proposed project/programme. Add more lines as necessary. The endorsement letters should be attached as an annex to the project/programme proposal. Please attach the endorsement letters with this template; add as many participating governments if a regional project/programme:*

Mr. Datuk Nor Yahati Binti Awang Deputy Secretary General Environmental Sustainability Ministry of Natural Resources and Environmental Sustainability	Date*: July 2 2025*
Ms. Analiza Rebuelta-Teh Undersecretary Finance, Information Systems and Climate Change Department of Environment and Natural Resources (DENR)	Date*: June 26 2025*

[62] 6. Each Party shall designate and communicate to the secretariat the authority that will endorse on behalf of the national government the projects and programmes proposed by the implementing entities.

B. Implementing Entity certification *Provide the name and signature of the Implementing Entity Coordinator and the date of signature. Provide also the project/programme contact person's name, telephone number and email address*

<table>
<tr><td colspan="2">I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans (such as Malaysia's Climate Change Adaptation Framework for Water Sectors, 2021 and the Philippines Rice Industry Road Map, 2018 by DoA) and subject to the approval by the Adaptation Fund Board, commit to implementing the project/programme in compliance with the Environmental and Social Policy of the Adaptation Fund and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.</td></tr>
<tr><td colspan="2">Ganna Onysko
Ms. Ganna Onysko
Senior GEF, GCF, AF Coordinator
Division of Funding Partner Relations
Directorate of Global Partnerships and External Relations
United Nations Industrial Development Organization - UNIDO
Implementing Entity Coordinator</td></tr>
<tr><td>Date: 3 July 2025</td><td>Tel. and email:

+43 1 26026 3708

TO: g.onysko@unido.org
CC: gef@unido.org / glo@unido.org / f.haidara@unido.org</td></tr>
<tr><td colspan="2">Project Contact Person: Meryem SGHIR</td></tr>
<tr><td colspan="2">Tel. And Email:

+43 1 26026 364743

M.SGHIR@unido.org</td></tr>
</table>

KEMENTERIAN SUMBER ASLI DAN KELESTARIAN ALAM
MINISTRY OF NATURAL RESOURCES AND ENVIRONMENTAL SUSTAINABILITY
Blok F11, Kompleks F
Lebuh Perdana Timur, Presint 1
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Website : www.nres.gov.my

NRES.700-7/1/3 (5) (S)
2 July 2025

The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: afbsec@adaptation-fund.org
Fax: 202 522 3240/5

Dear Sir,

ENDORSEMENT FOR THE CONCEPT PROPOSAL "STRENGTHENING CLIMATE RESILIENCE AND FOOD SECURITY THROUGH SOUTH-SOUTH COOPERATION IN ADAPTIVE RICE PRODUCTION IN MALAYSIA AND THE PHILIPPINES"

With reference to the above matter.

2. In my capacity as designated authority for the Adaptation Fund in Malaysia, I confirm that the above regional project proposal is in accordance with the government's national priorities in implementing adaptation activities to reduce adverse impacts of, and risks posed by, climate change in Malaysia.

3. Accordingly, I am pleased to endorse the above project proposal with support from the Adaptation Fund. If approved, the project will be implemented by the United Nations Industrial Development Organization (UNIDO) and executed by Bioeconomy Corporation and the Asian Disaster Preparedness Center (ADPC). UNIDO will also act as partial executing entity, in line with the request and agreement of the Government of the Philippines.

4. The project design will address climate change threat to food security by enhancing adaptation capacity and creating an enabling environment for investments in agriculture sector. The project aims to complement further development of National Adaptation Plan, as well as to build resilience of rice farming communities.

Thank you.

Sincerely,

(DATUK NOR YAHATI BINTI AWANG)
Designated Authority to the Adaptation Fund
Deputy Secretary General (Environmental Sustainability)
Ministry of Natural Resources and Environmental Sustainability
Malaysia

ADAPTATION FUND

JUN 2 6 2025

Letter of Endorsement by Government

To: The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: afbsec@adaptation-fund.org
Fax: 202 522 3240/5

Subject: Endorsement for the Concept Proposal **"Strengthening Climate Resilience and food security through South-South Cooperation in adaptive rice production in Malaysia and the Philippines"**

In my capacity as designated authority for the Adaptation Fund in the Philippines, I confirm that the above regional project proposal is in accordance with the government's national priorities in implementing adaptation activities to reduce adverse impacts of, and risks posed by, climate change in the Philippines.

Accordingly, I am pleased to endorse the above project proposal with support from the Adaptation Fund. If approved, the project will be implemented by the United Nations Industrial Development Organization (UNIDO) and executed by Bioeconomy Corporation and the Asian Disaster Preparedness Center (ADPC). UNIDO will also act as partial executing entity, in line with the request and agreement of the Government of the Philippines

Thank you.

Very truly yours,

ATTY. ANALIZA REBUELTA-TEH
Undersecretary
Finance, Information Systems and Climate Change
and National Designated Authority-Adaptation Fund

Revised PFG Submission Form[1] (additions in red)

Project Formulation Grant (PFG)

Submission Date:

Adaptation Fund Project ID: 230157
Country/ies: Malaysia, The Philippines
Title of Project/Programme: Strengthening Climate Resilience and food security through South-South Cooperation in adaptive rice production in Malaysia and the Philippines
Type of IE (NIE/RIE/MIE): MIE
Implementing Entity: UNIDO
Executing Entity/ies: UNIDO, Department of Agriculture of The Philippines, Malaysian Bioeconomy Development Corporation, Asian Disaster Preparedness Center (ADPC)

A. Project Preparation Timeframe

Start date of PFG	October 2025
Completion date of PFG	May 2026

B. Proposed Project Preparation Activities ($)

List of Proposed Project Preparation Activities	Output of the PFG Activities	US$ Amount	Budget note[2]
Preparation of the full fledge project document and required annexes by ADPC: - To conduct a Climate Risk and Vulnerability Assessment (CRVA) - To prepare a baseline report against the interventions proposed and indicators/targets aimed ; - To carry out detailed stakeholders' consultations at local and national level, specifically on selected project sites, with local	- CRVA assessment report - Baseline report - Stakeholders' consultation report - Environmental and Social Management Plan (ESMP) and a UNIDO Environmental and Social (E&S) Screening form - Plan of action for gender mainstreaming is	**60,000**	CRVA Analysis: $35,000 International Travel: $5,000 Local Travel: $2000 Preparation of Baseline Report: $1000 Preparation of Gender Report: $1000 Preparation of M&E Plan and ESM Assessment: $1000 Project Proposal Development: $10000 Workshop Cost: $5000

[1] As presented in AFB/PPRC.33/40 Annex 1.
[2] The proposal should include a detailed budget with budget notes indicating the break- down of costs at the activity level. It should also include a budget on the Implementing Entity management fee use.

communities and indigenous populations; - To conduct specific analyses in support of the proposed projects - To conduct an Environmental and Social Management assessment - To carry out an In-depth gender analysis in order to effectively mainstream gender issues into the design and formulation of the project. - To Identify project or programme indicators and development of monitoring and evaluation plan. - To prepare the full-fledge project proposal as per the requirements of the Adaptation Fund	developed, Project document is gender - mainstreamed - and costs for implementation estimated - Monitoring and evaluation plan.		
UNIDO direct support in facilitating local consultations, workshops to discuss the specific project and program ideas (including translation into local languages, preparation of background papers, etc.).	- Report on local consultations, workshops supported	**15,000**	International and national travel: US$ 10,000 Local travel: 5,000
HACT assessment for the executing entities	HACT assessment	**10,000**	Subcontracting an entity for HACT assessment based on UNIDO Long-term agreement (LTA) : 2 X US$ 5,000 = $ 10,000
To carry out a monitoring mission by the backstopping officer of UNIDO	Mission report	**15,000**	International and national travel: US$ 10,000 Project manager time: US$ 5,000
To organize pre-validation workshops at local level, specifically on selected project sites, with local communities and indigenous populations and validation workshops at national level and regional level	Validation workshop report	**30,000**	Workshop expenses: US$ 30,000
Total Project Formulation Grant		**130,000**	

Description of the required activity	Justification for the need and for the amount
To conduct a Climate Risk and Vulnerability Assessment (CRVA):	The Climate Risk and Vulnerability Assessment covers assessments of climate risks, climate exposure, sensitivity, and vulnerability and identification of adaptation measures for the target sector in the identified regions. Measuring the sector's vulnerability to climate change impacts is necessary to increase the sector's resilience. This assessment will be conducted by a national adaptation expert, with the support of a project assistant to facilitate related travel of the adaptation expert and coordination with various stakeholders
To conduct a baseline assessment	The baseline assessment will be conducted so that the data and information is provided to support the interventions proposed and indicators/targets aimed at. The methodology will be based on a participatory approach, collection primary data at the local, community level and secondary data.
To carry out detailed stakeholders' consultations at local and national level:	Stakeholder consultation serves as a fundamental mechanism for collecting information, perspectives, and feedback from individuals involved in a project. This activity will serve to ensure further alignment of an engagement plan with the needs, expectations, and concerns of all relevant stakeholders. The stakeholders' consultations will target specifically selected project sites, involving local communities and indigenous populations;
To conduct an Environmental and Social Management assessment :	This activity is an integral part of UNIDO Environmental and Social Safeguards Policy and Procedures, applicable to all UNIDO projects and programmes submitted to the AF. It requires that UNIDO projects and programmes undergo environmental and social risk (E&S) assessments which will help decide on the categorization of the project and identify environmental and social issues that should be addressed in its development and implementation. The ESM will provide guidance on how to mitigate the environmental and social risks during the project implementation phase. This activity will be conducted by a technical expert and will require local travel to the project sites.
To carry out an In-depth gender analysis in order to effectively mainstream gender issues into the design:	This activity will allow mainstreaming a gender perspective is the process of assessing the implications for women and men of any planned action, including legislation, policies or programmes, in all areas and at all levels. It is a strategy for making both women and men's concerns, experiences and aspirations an integral dimension of the design, implementation, monitoring and evaluation of policies and programmes in all political, economic and societal spheres so that they benefit equally, and inequality is not perpetuated. This activity will be conducted by a national gender expert and will require travel to the project sites and consultations with various groups of beneficiaries.
Harmonized Approach to Cash Transfers (HACT) assessment for the executing entity	This Micro assessment dictates policies and procedures for capacity assessment, cash transfer modality, audit, assurance and monitoring. It is a requirement in order to make sure that the executing entity has the capacity to deliver project activities. This activity will be delivered via a subcontract of an audit company under a Long-Term Agreement (LTA) with UNIDO.
To carry out a monitoring mission by the backstopping officer of UNIDO	This travel is earmarked for the project manager of UNIDO who needs to contribute in terms of technical backstopping, supporting the mobilization of the endorsement letter and the stakeholders' consultations with key institutions and providing orientation on the project design, scope and budgeting. The fee of the project manager is covered by the support costs
To prepare the full-fledge project proposal as per the	This activity will gather the results of all the assessments conducted during the preparation of the full fledge project proposal, following the template of the Adaptation fund and the requirements of UNIDO. The full-fledge proposal will

requirements of the Adaptation Fund	be presented to all key stakeholders for validation during national and regional workshops. The drafting and compiling of the project proposal will be conducted by a national adaptation expert, supported by an internal expert in programming. The validation workshop will be organized with eh support of the project support staff, with the participation of the national and international technical experts.
To organize a validation workshop	Given the wide scope of teh target regions in both Malaysia and The Philippines, this activity will involve in person pre-validation workshops at the level of the target communities and indigenous populations in order to ensure their buy in of the proposed project interventions. This will be conducted during pre-validation workshops. Also validation workshops will be conducted virtually separately in Malaysia and The Philippines so that each country has an opportunity to focus on the proposed project intervention and provide validation. A final regional validation workshop will bring both countries together, presenting the final project document for the validation by both countries

C. Implementing Entity

This request has been prepared in accordance with the Adaptation Fund Board's procedures and meets the Adaptation Fund's criteria for project identification and formulation

Implementing Entity Coordinator, IE Name	Ms. Ganna Onysko Senior GEF, GCF, AF Coordinator Division of Funding Partner Relations Directorate of Global Partnerships and External Relations United Nations Industrial Development Organization - UNIDO Implementing Entity Coordinator	
Signature	Ganna Onysko	**Date:** 3 July 2025
Project Contact Person	Meryem SGHIR +43 1 26026 364743 M.SGHIR@unido.org	
Telephone	+43 1 26026 3708	
E-mail	TO: g.onysko@unido.org	

	CC: gef@unido.org / glo@unido.org / f.haidara@unido.org

Annex 1 – Validation Workshop in Malaysia (Date: 25 February 2025)

NO	NAME	DESIGNATION	ORGANISATION
1	Mr Yee Chen Hua	Senior Principal Assistant Secretary, Sustainable Agriculture Section, Policy and Strategic Planning Division (DPS)	Ministry of Agriculture & Food Security (KPKM)
2	Mr. Syukrie Mohd Nasir	Senior Principal Assistant Secretary, Macro Policy Section, Policy and Strategic Planning Division (DPS)	Ministry of Agriculture & Food Security (KPKM)
3	Mr. Muhamed Mat Yaakob	Deputy Secretary, Policy and Strategic Planning Division (DPS)	Ministry of Agriculture & Food Security (KPKM)
4	Mrs. Norfazira Salleh	Assistant Secretary (Climate Change Program Unit), Climate Change Policy Section	Ministry of Natural Resources and & Environmental Sustainability (NRES)
5	Ms. Aimi Ayuni Mohamad Sapia	Executive Officer, MGTC (Adaptation Unit), Climate Change Policy Section	Ministry of Natural Resources and & Environmental Sustainability (NRES)
6	Mrs. Lim Li Tian	Principal Assistant Secretary, Strategic Technology and S&T Applications Division	Ministry of Science, Technology & Innovation (MOSTI)
7	Mr. Mohd Fairuz Md Suptian	Deputy Director of the Climate Change Program	Malaysian Agricultural Research and Development Institute (MARDI)
8	Mr. Mohd Solihen Jamal	Deputy Director, Breeding Program, Rice & Paddy Research Center	Malaysian Agricultural Research and Development Institute (MARDI)
9	Mrs. Shaidatul Azdawiyah Abdul Talib	Environmental Sciences and Management, Environmental Assessment and Management Agrobiodiversity & Environment Research Center	Malaysian Agricultural Research and Development Institute (MARDI)
10	Mrs. Kogeethavani A/P Ramachandran	Senior Research Officer Plant Pest, Disease Management, and Control Rice & Paddy Research Center	Malaysian Agricultural Research and Development Institute (MARDI)
11	Mr. Sayed Ismail Nasiruddin	Deputy Permanent Secretary	Ministry of Food Industry, Commodity & Regional Development, Sarawak (M-FICORD)
12	Mr. Lim Wui Wui	Economic Affairs Officer, Policy & Planning Section	M-FICORD
13	Ms. Nancy Mongin	Principal Assistant Secretary, Paddy & Grains Section	M-FICORD
14	Ms. Putri Ainaa Afiqah Hossen	Agriculture Officer, Paddy and Grain Division	Department of Agriculture, Sarawak
15	Mr. Ismail Iberahim	IADA Pulau Pinang	IADA Pulau Pinang
16	Ms. Norjana Jamal	National Climate Center	Malaysian Meteorological Department
17	Mr. Mohd Shahrizal Mohd Noor	Economic Affairs Officer Planning & Information Technology Division	Muda Agricultural Development Authority (MADA)
18	Mrs. Sooksiri Chamsuk	Deputy Representative, Regional Hub	UNIDO

NO	NAME	DESIGNATION	ORGANISATION
19	Dr. Senaka Basnayake	Director, Climate Resilience Department	ADPC
20	Mr. Niladri Gupta	Senior Water Resources Management Specialist	ADPC
21	Datin Aznita Naziz	Industry Development Division	Bioeconomy Corporation
22	Mrs. Shamini Poovendran	Industry Development Division	Bioeconomy Corporation
23	Mr. Cher Tan	Industry Development Division	Bioeconomy Corporation
24	Mrs. Norsuzana Abdul Rahman	Corporate Strategy	Bioeconomy Corporation
25	Ms. Mas Srikandy Mohammed Salleh	Corporate Strategy	Bioeconomy Corporation

Annex 2 – Validation Workshop in the Philippines (Date: 19 February 2025)

S#	Organization/ Office	Representative	Title
1	Philippine Institute for Development Studies (PIDS)	Dr. Sonny Domingo,	Senior Research Fellow Philippine Institute for Development Studies
2	International Rice Research Institute (IRRI)	Dr Jauhar Ali	Principal Scientist and the Hybrid Rice Breeding Lead at IRRI
3	Philippine Center for Postharvest Development and Mechanization (PhilMech)	Joshua Israel V. Sumague John Janelle Duria	
4	DOST - PAGASA	Ma. Elena V. Tan, MPA Nestor R. Eugenio	Chief, Farm Weather Services Section PAGASA Weather Specialist II Farm Weather Services Section
5	Rice Productivity Advocacy Inc. (RICE BOARD)	Mr Recher Ondap	President
6	DENR - Climate Change Services?	Dir. Al Orolfo	Director, DENR
7	DENR - EMB - Climate Change Division	James Clierick Ola	
8	University of the Philippines Los Baños Foundation Inc. (UPLBFI)	Ms. Dorcas V. Trinidad	
9	Department of Science and Technology - Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (DOST - PCAARRD)	Ms. Gemmalyn M. Trespalacio,	S&T Fellow I at the SocioEconomics Research Division of DOST-PCAARRD
10	PhilRice Research Institute (PhilRice)	Leylani M. Juliano, Mary Rose O. Mabalay,	Chief Science Research Specialist Project Lead, Climate-Smart MapAgronomy, Soils, and Plant Physiology Division PHILIPPINE RICE RESEARCH INSTITUTE (PhilRice)

S#	Organization/ Office	Representative	Title
11	Department of Agriculture Regional Field Office 3	Rodelyn Manansala Zayra Toledo	
12	Department of Agriculture Regional Field Office 6	Online	
13	Department of Agriculture Regional Field Office 10	Online	
14	Department of Agriculture Regional Field Office 12	Online	
15	DA AMIA	Saturnina Halos Maria Jannell Feliz Talavera Enzo Dela Cruz	
16	DA OURID	Dir. Emerson Yago Cyrille Reyes	
16	UNIDO	Dr Evelyn Taboada Jimmie Neil Kang	

Annex 3 – Consultations in Malaysia and the Philippines

Malaysia

The Philippines