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Adaptation Fund Board
Project and Programme Review Committee
Thirty-sixth Meeting
Bonn, Germany, 7-8 October 2025

PROPOSAL FOR MALAYSIA, PHILIPPINES

ADAPTATION FUND BOARD SECRETARIAT TECHNICAL REVIEW OF PROJECT/PROGRAMME PROPOSAL

PROJECT/PROGRAMME CATEGORY: Regional Project Concept

Countries/Region: Malaysia and The Philippines
Project Title: Strengthening Climate Resilience and food security through South-South Cooperation in adaptive rice production in Malaysia and the Philippines
Thematic Focal Area: Food security
Implementing Entity: United Nations Industrial Development Organization (UNIDO)
Executing Entities: UNIDO and Malaysian Bioeconomy Development Corporation, Asian Disaster Preparedness Center (ADPC)
AF Project ID:
IE Project ID:
Requested Financing from Adaptation Fund (US Dollars): 13,707,500
Reviewer and contact person: Alexandra Munoz
Co-reviewer(s):
IE Contact Person:

Technical Summary	The project "Strengthening Climate Resilience and food security through South-South Cooperation in adaptive rice production in Malaysia and the Philippines" aims 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. This will be done through the four components below: Component 1: Medium and largescale 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 (USD 5,000,000); Component 2: Strengthened integrated information & climate intelligence for farmers and institutions (USD 3,500,000); Component 3: Institutional capacity building for localized adaptation strategies to create enabling environment for investments in Agriculture Marketing Services (USD 2,500,000); Component 4: Regional knowledge platform for South-South Cooperation (USD 500,000).

	<u>Requested financing overview:</u> Project/Programme Execution Cost: USD 961,364 Total Project/Programme Cost: USD 12,461,364 Implementing Fee: USD 1,246,136 Financing Requested: USD 13,707,500 The proposal includes a request for a project formulation grant and/or project formulation assistance grant of USD 130,000. The initial technical review raises several issues, such as the clarity of concrete adaptation actions and beneficiaries; the Theory of Change alignment and coherence; and the level of detail in cost-effectiveness reasoning and national technical standards, as is discussed in the number of Clarification Requests (CRs) and Corrective Action Request (CAR) raised in the review. The second technical review raises several issues, such as how benefits will be equitably distributed (including gender considerations); how the innovative solutions outlined were successful in other countries; and to clarify how the program aligns with the Adaptation Fund Results Framework, as is discussed in the number of Clarification Requests (CRs) and Corrective Action Request (CAR) raised in the review.
Date	August 29, 2025

Review Criteria	**Questions**	**First Technical Review Comments July 21, 2025**	**Second Technical Review Comments [August 29, 2025**
Country Eligibility	1. Are all of the participating countries party to the Kyoto Protocol and/or the Paris Agreement?	**Yes.** The country has signed and ratified the Kyoto Protocol and the Paris Agreement.	**-**

	2. Are all of the participating countries developing countries particularly vulnerable to the adverse effects of climate change?	**Yes.** The Climate Change Adaptation Framework for Water Sectors, 2023 acknowledges climate change as a fundamental threat in Malaysia. The Philippines is also highly vulnerable to its impact, including sea level rise, increased frequency of extreme weather events (typhoons and storm surges), rising temperatures, and extreme rainfall.	**-**
Project Eligibility	1. Have the designated government authorities for the Adaptation Fund from each of the participating countries endorsed the project/programme?	**Yes.** As per the Endorsement letter dated June 26th, 2025, for The Philippines, and the Endorsement letter dated July 2nd, 2025, for Malaysia.	**-**
	2. Does the length of the proposal amount to no more than fifty (50) pages for the project/programme concept, including its annexes?	**Yes.** The concept note is 50 pages including its annexes.	**No.** The concept note is 63 pages including its annexes. **CAR (NEW1):** Kindly amend the concept note to a maximum of 50 pages, including the annexes.

	3. Does the regional project / programme support concrete adaptation actions to assist the participating countries in addressing the adverse effects of climate change and build in climate resilience, and do so providing added value through the regional approach, compared to implementing similar activities in each country individually?	**Yes.** However, additional information is required. The concept note outlines a relevant set of activities such as deployment of climate-resilient rice varieties and creation of climate intelligence platforms to address climate change impacts. The proposed project contributes to the thematic focal area of Food Security. However, how these activities translate into concrete and measurable adaptation benefits need more details. In addition, the value from the regional approach should be accompanied by sound justification. **CR1:** Please clearly outline the specific adaptation actions that the project will lead to, including their tangible outcomes and measurable impact. **CR2:** Kindly add a sound justification and explanation of the proposed South-South regional cooperation, including how it adds value compared to national-level interventions. **CAR1:** Kindly indicate explicitly how the project supports one or more of the Adaptation Fund Strategic Results. **CR3:** Please state what scenario in climate projections was considered for the proposed project's design.	**Not Cleared.** Further information is required. **CR1: Cleared.** As per the information provided in Part II.B, table 5. **CR2: Not Cleared.** Even though more information was provided to include a justification of the South-South cooperation, please refer to how regional cooperation adds value compared to national-level interventions. Please refer to any existing agreement, special agreements or plans between the countries, among other reasons, if possible. In the case

		CAR2: Please provide information on the specific locations in Malaysia and the Philippines which the project is targeting. This is important to determine whether there are any environment or social risks associated with the proposed project and for compliance with AF ESP. If the specific locations are yet to be determined, please follow guidance at **Guidance Document for Project/Programme with Unidentified Sub-Projects** and amend the proposal accordingly.	that ASEAN policies are referred to, please outline clearly the specific policies/objectives/goals that are related to this proposed project. **CAR1: Not Cleared.** Kindly indicate clearly how the program aligns with Outcome 4 (physical assets improved or constructed to withstand climate variability and change), Outcome 5 (Increased ecosystem resilience in response to climate change and variability induced stress). Please rephrase alignment with Outcome 8 to clarify the innovation in specific. **CR3: Cleared.** As per information provided in Part I, paragraph 22. **CAR2: Cleared.** As per information provided in Part I, tables 1 y 2.

	4. Does the project / programme provide economic, social and environmental benefits, particularly to vulnerable communities, including gender considerations, while avoiding or mitigating negative impacts, in compliance with the Environmental and Social Policy of the Fund?	**Unsure.** The proposal outlines expected benefits and refers to vulnerable populations and women. However, it lacks quantitative estimates of these benefits, and it does not clearly identify the specific vulnerable groups or demonstrate how benefits will be equitably distributed. The project also does not specify the location. As this element for economic, social and environmental benefits are context specific additional information is required in the proposal to make a determination. Please see **CAR2** above. **CAR3:** Please identify the specific vulnerable groups (e.g., smallholder farmers, women, indigenous peoples) who will be benefit from the project. **CAR4:** Kindly indicate the estimated number of direct and indirect beneficiaries by country and gender-disaggregated if possible. **CR4:** Kindly quantify expected economic, environmental, and social benefits, whenever possible. **CR5:** Please describe how benefits will be equitably distributed, including how gender considerations have been integrated.	**CAR3: Cleared.** As per information provided in Part II. C, paragraph 70. **CAR4: Cleared.** As per information provided in Part II. C, paragraph 71. **CR4: Not Cleared.** Kindly include in the concept note an approximation of the expected economic, environmental, and social benefits of the proposed project, as overall for each dimension, whenever possible. **CR5: Not Cleared.** Please describe explicitly how benefits will be equitably distributed, including how gender

			considerations have been integrated.
	5. Is the project / programme cost-effective and does the regional approach support cost-effectiveness?	**Unsure.** The concept note does not provide a comparison of cost-effective options or justification of the cost-efficiency of the chosen approach. **CAR5:** Please provide a cost effectiveness analysis which includes project specific information based on the project outputs and activities including quantitative comparison of the cost-effectiveness of the proposed measures with alternative adaptation measures. **CR6:** Kindly elaborate on how the regional approach reduces costs or increases the value of outputs compared to country-level interventions.	**Cleared.** As per information provided according to the following CAR y CR. **CAR5: Cleared.** As per the information provided in Part II.E, table 6. **CR6: Cleared.** As per information provided in Part II.D, paragraph 78.

	6. Is the project / programme consistent with national or sub-national sustainable development strategies, national or sub-national development plans, poverty reduction strategies, national communications and adaptation programs of action and other relevant instruments? If applicable, it is also possible to refer to regional plans and strategies where they exist.	**Yes.** However, additional information is required. The concept note aligns with key national strategies and plans in both countries, Malaysia and The Philippines. However, NDCs for both countries as well as The Philippines Adaptation Plan are not included. **CR7:** Kindly review to include an exhaustive list to include NDCs for both countries and the Adaptation Plan for The Philippines. **CR8:** Please also strengthen the alignment of the project to the regional level strategies, networks etc. **CR9:** The project speaks to developing EWS, please clarify alignment with any national meteorological or disaster risk reduction early warning plans, systems and strategies.	**Cleared.** As per information provided according to the following CAR y CR. **CR7: Cleared.** As per information provided in Part II.F, table 7. **CR8: Cleared.** As per information provided in Part II.F, paragraphs 86-87. **CR9: Cleared.** As per information provided in Part II.A, paragraph 49.

	7. Does the project / programme meet the relevant national technical standards, where applicable, in compliance with the Environmental and Social Policy of the Fund?	**Unsure.** The proposed project briefly mentions compliance with national technical standards but does not identify specific standards or outline a plan for compliance. **CAR6:** Please specify all national technical standards applicable to the proposed project (e.g., EIA, water use regulations, agricultural input standards) and explain how it will comply with each one of these.	**CAR6: Not Cleared.** Kindly refer to specific regulations instead of generic standards in the list. Please specify all national technical standards applicable to the proposed project (e.g., land use, water use regulations, agricultural input standards) and explain concise, but clear and specific, how it will comply with each one of them.

	8. Is there duplication of project / programme with other funding sources?	**Unsure.** The concept note does not provide a comprehensive list of the projects in the same sector and geography, and therefore, there is not a clear assessment of all possible overlaps with the proposed project. **CAR7:** Please identify other relevant climate or agriculture-related initiatives in the project areas funded by other donors. This list should be comprehensive in the form of a table, outlining main project interventions, timeline, target population, and specific location within the country. **CR10:** Within this table, kindly explain how duplication will be avoided, how the project is complementary to other projects, and what synergies will be built.	**CAR7: Not Cleared.** Kindly provide the following information: (i) name of the project, (ii) description and main project interventions, (iii) timeline, (iv) target population, and (v) specific location within the country, for all relevant climate and agriculture-related initiatives placed in the project areas that are funded by other donors. **CR10: Not Cleared.** Within this table, please explain how duplication will be avoided (for example, projects not related to rice, or implemented in different locations, among others sound justifications), and how the project is complementary to other projects, and what synergies will be built. The explanations should be concise but precise for each case.

	9. Does the project / programme have a learning and knowledge management component to capture and feedback lessons?	**Yes.** However, additional information is required. The proposed project includes a dedicated Component 4 to support South-South cooperation and knowledge exchange through a Regional Knowledge Platform for South-South Cooperation and Farmer's Climate Field Living Labs. However, the project does not provide a MEL framework that will guide how experiences will be documented. **CR11:** Kindly clarify how the proposed project will enable keeping track of the experiences shared on the platform, and how training lessons will be carried out. **CR12:** Please clarify if any arrangements will be in place for addressing any possible barriers (related to costs or otherwise) of farmers accessing the information from the regional platform.	**CR11: Not Cleared.** Kindly clarify how the proposed project will enable keeping track of the experiences on the platform overtime, and how training lessons will be carried out (ideally a brief of the flowchart for this task). **CR12: Not Cleared.** Please briefly explain what arrangements are needed to address any potential barriers (such as costs, institutional limitations, or capacity-building needs) that may prevent farmers from accessing information from the regional platform.

	10. Has a consultative process taken place, and has it involved all key stakeholders, and vulnerable groups, including gender considerations in compliance with the Environmental and Social Policy and Gender Policy of the Fund?	**Yes.** However, additional information is required. The proposal highlights an initial consultative process. Validation workshops were held in both countries. Annexes 1–3 provide summaries of consultations including with women and farmer groups. Part II.J also provides details on the consultation process. **CR13:** While the proposal provides summaries of participants, kindly provide further explanation on gender considerations discussed and what interests were considered. Further indicated how the discussions have been incorporated into the development of the concept.	**CR13: Not Cleared.** While the proposal provides summaries of participants, further explanations on gender considerations are required. Please provide in the concept note, under Part II.J, how these considerations were included in the preparation of the proposed project.
	11. Is the requested financing justified on the basis of full cost of adaptation reasoning?	**Yes.**	-
	12. Is the project / program aligned with AF's results framework?	**Yes.** However, amendment is required. **CAR8:** Please utilize the template and format of the template as presented at Results Framework Alignment Table (Amended in March 2019) (77 kB, DOC). **CR14:**	**Not Cleared.** Further information is required. **CAR8: Not Cleared.** Please amend table 12 using the template Results Framework Alignment Table and the example in the same link. For example, Grand amount should be provided per project's objective. Also, please clarify

		1. To be consistent with the template, the first row of the alignment table should capture the project's overall objective only. 2. The following rows should each contain the various project components. In the second column project outcome indicator should be included. Columns 3 and 4 should contain AF outcomes and outcome indicators respectively and the final column should contain the grant amount associated with each Fund outcome indicate. The same format should be adopted for the outputs section- Second (bottom) part of the table. That way the top half and the bottom half corresponds, and the totals should be the totals of the project activities. 3. Please ensure that the fund outcomes and fund outcome indicators are correctly numbered and worded.	what project component is referring to the first row of table 12. **CR14: Not Cleared.** Please consider the following: (i) To align with the template, the first row of the alignment table should include only the project's general objective as a standalone statement. It should not be linked to any specific outcome or output. (ii) The upper part is related to outcomes while the bottom is for outputs. Both section should correspond, and the total grant amount associated with each Fund Outcome should be the totals of the project activities. (iii) Please ensure that the Fund Outcomes and Fund Outcome Indicators are correctly numbered and worded. (iv) Please remove the breakdown by country e.g. Malaysia USD 1.5 million: the Philippines USD 2

			million)" from the grant amount column.
	13. Has the sustainability of the project/programme outcomes been taken into account when designing the project?	**Yes.** However, additional information is required. The concept note provides a discussion about the sustainability of the proposed project through institutional partnerships, capacity building and integration with national policies. However, there is no mention of regulations and resources specifically needed, and therefore, it is not clear how the project will be sustained in the long run, nor if replication and scaling up will be able to be achieved in either of the countries. **CR15:** Kindly explain the arrangements (for example, financial, social, regulatory, institutional, economic, environmental) to be achieved on the sustainability and maintenance of the project. **CR16:** Kindly identify the adaptation benefits that can be sustained after this project ends and explain if this can be replicated and/or scale up.	**Not Cleared.** Further information is required. **CR15: Not Cleared.** Kindly describe the specific arrangements (e.g., financial, social, regulatory, institutional, economic, environmental) that will support the sustainability and long-term maintenance of the project. The arrangements should be concrete; for instance, instead of referring to "national agricultural programs" in general, please specify the exact agricultural program that could be leveraged for the project integration. **CR16: Cleared.**

			As per information provided in Part II.L, paragraph 110.
	14. Does the project / programme provide an overview of environmental and social impacts / risks identified, in compliance with the Environmental and Social Policy and Gender Policy of the Fund?	**No.** The proposed project provides a checklist of risks in Table 4, including potential impacts and risk level. However, the project classification (A, B or C) from the screening is not stated, and more details are needed. **CAR9:** Based on the assessments conducted with the PFG grant further assessment is required for most of the ESPs. Please review Table 4 accordingly. Also recall that further assessments are typically required for ESPs 1, 4 and 6. **CR17:** Please include all potential direct, indirect, transboundary, and cumulative impacts and risks that could result from the proposed project based on the 15 Adaptation Fund ESP principles. **CAR10:** Kindly provide, under Part II.M, an Initial Gender Assessment, including details about gender-specific cultural and legal context in both countries. **CAR11:** Kindly state in Part II.M the category of the project from the screening process (Category A, B or C).	Further information is required. The proposed project provides a checklist of risks in Table 11, including potential impacts and risk level. However, more details are needed. **CAR9: Not Cleared.** Kindly provide further assessments for all of the ESPs, and revise Table 11 accordingly. Risks should be written as "There is a risk ….". If no further assessment is selected, please provide a sound justification for this (it should be specific rather than generic) and leave the third column blank. Also recall that further assessments are always required for ESPs 1, 4 and 6. **CR17: Not Cleared.** Please include at the concept note stage all potential direct, indirect, transboundary, and cumulative impacts and risks that could result from the proposed project for each of the 15 Adaptation Fund ESP principles. **CAR10: Not Cleared.**

			Although some gender context is provided for both countries, more information is needed to refer it as an assessment. Kindly provide, for each country, statistics on gender in general and, if possible, of gender in the sector. This is aimed at providing some guidance on the gender gap. **CAR11: Cleared.** As per information provided in Part II.M, paragraph 111.
	15. Does the project promote new and innovative solutions to climate change adaptation, such as new approaches, technologies and mechanisms?	**Yes.** However, more information is needed. At Part II.A, pages 22-23**,** the proposed project introduces Agriculture 4.0 tools (drones, remote sensing, precision farming, and digital farming platforms), climate-change resilient rice varieties and the implementation of climate-smart cultivation techniques. The project contributes to: "*Rolling out innovative adaptation practices, tools and technologies that have demonstrated success in one country to new countries/regions".* **CR18:** Kindly include how the innovative solutions outlined in the concept note were successful in another country/region.	**CR18: Not Cleared.** Kindly include how the innovative solutions outlined in the concept note were successful in another country/region. *The aspect of innovation will be more thoroughly assessed in the next round of review*.

		The aspect of innovation will be more thoroughly assessed in the next round of review.	
Resource Availability	1. Is the requested project / programme funding within the funding windows of the regional projects/programmes?	**Yes.**	**-**
	2. Are the administrative costs (Implementing Entity Management Fee and Project/ Programme Execution Costs) at or below 10 per cent of the project/programme for implementing entity (IE) fees and at or below 10 per cent of the project/programme cost for the execution costs?	**Yes.** However, amendments are required as per the CRs and CARs below. **CAR12:** Kindly fix the fee calculations in Table 2, page 19, according to the definitions in https://www.adaptation-fund.org/generic/costs-and-fees/. **CAR13:** Please disaggregate the resources each EE will execute in component 4, in order to clarify the cap for the administrative costs. If the actual execution costs of the IE UNIDO exceed 1.5% cap of components for the budget for these components in the Philippines. Please use the IE and EE Fees Calculator to calculate the total program cost and the corresponding fees: https://www.adaptation-fund.org/document/ie-and-ee-fees-calculator/. Please provide justification with supporting request from DA for UNIDO	**Cleared.** As per information provided in table 2 and Support Letter from IE for components 1 and 3. **CAR12: Cleared.** As per information provided in Table 2. **CAR13: Cleared.** As per information provided in Table 2 and Support Letter from IE Execution for components 1 and 3.

		executing Components 1 and 3 in the Philippines. **CR19:** Please clarify if it is intended that all three EEs for the project will be serving as EE for the PFG. If only UNIDO will execute the PFG please update the PFG request form to reflect this. **CAR14:** Please include the line item and amount of the IE fees for the PFG as required by the template.	**CR19: Cleared.** As per information provided in PFG request indicating only UNIDO as the EE for the PFG. **CAR14: Cleared.** As per the insertion of IE fees line in PFG request form.
Eligibility of IE	1. Is the project/programme submitted through an eligible Multilateral or Regional Implementing Entity that has been accredited by the Board?	**Yes.** UNIDO is an accredited MIE. Accreditation Expiration Date: November 30th, 2025.	**-**
Implementation Arrangements	1. Is there adequate arrangement for project / programme management at the regional and national level, including coordination arrangements within countries and among them? Has the potential to partner with national institutions, and when possible, national implementing entities (NIEs), been considered, and included in the management arrangements?	n/a at concept stage	

	2. Are there measures for financial and project/programme risk management?	n/a at concept stage	
	3. Are there measures in place for the management of for environmental and social risks, in line with the Environmental and Social Policy and Gender Policy of the Fund? Proponents are encouraged to refer to the Guidance document for Implementing Entities on compliance with the Adaptation Fund Environmental and Social Policy, for details.	n/a at concept stage	
	4. Is a budget on the Implementing Entity Management Fee use included?	n/a at concept stage	
	5. Is an explanation and a breakdown of the execution costs included?	n/a at concept stage	
	6. Is a detailed budget including budget notes included?	n/a at concept stage	
	7. Are arrangements for monitoring and evaluation clearly defined, including budgeted M&E plans and sex-disaggregated data, targets and indicators, in compliance with the Gender Policy of the Fund?	n/a at concept stage	

	8. Does the M&E Framework include a break-down of how implementing entity IE fees will be utilized in the supervision of the M&E function?	n/a at concept stage	
	9. Does the project/programme's results framework align with the AF's results framework? Does it include at least one core outcome indicator from the Fund's results framework?	n/a at concept stage	
	10. Is a disbursement schedule with time-bound milestones included?	n/a at concept stage	

ADAPTATION FUND

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: **13,707,500** (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, 2021[3] 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.

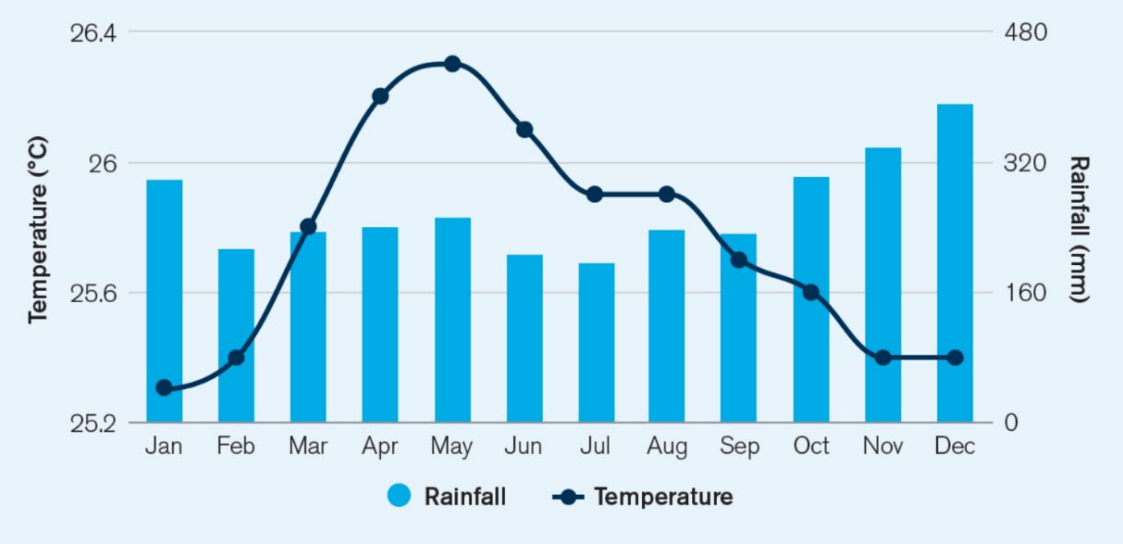

Figure 1: Average monthly temperature and rainfall in Malaysia (1991–2020)
Source: WBG Climate Change Knowledge Portal

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.

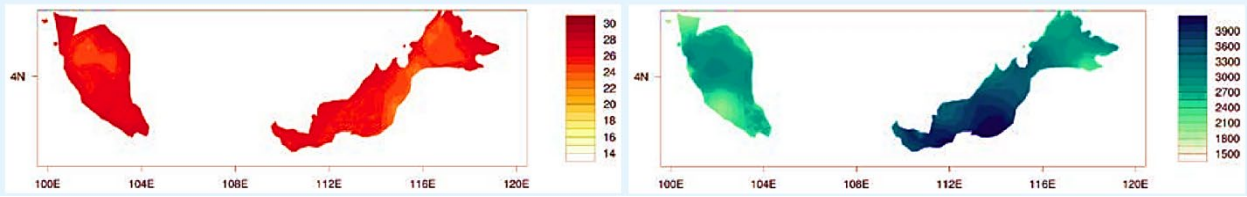

Figure 2: (Left) annual mean temperature (°C), and (right) annual mean rainfall (mm) in Malaysia over the period 1991–2020. (Source: WBG Climate Change Knowledge Portal (CCKP, 2021).

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].

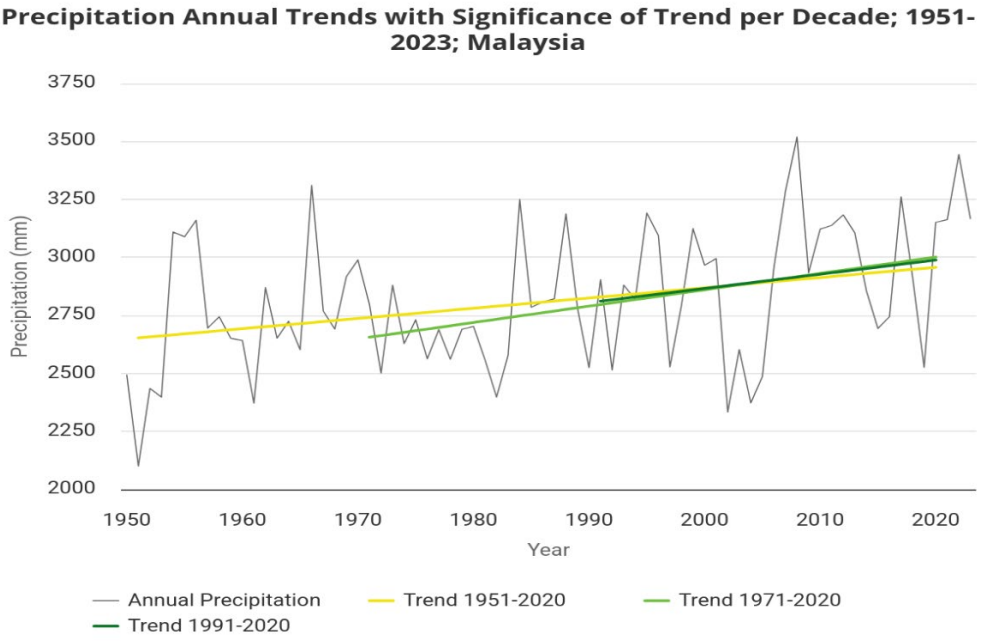

Figure 3: Precipitation Annual Trends with Significance of Trend per Decade (1951-2020) for Malaysia. Source: WBG Climate Change Knowledge Portal.

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.

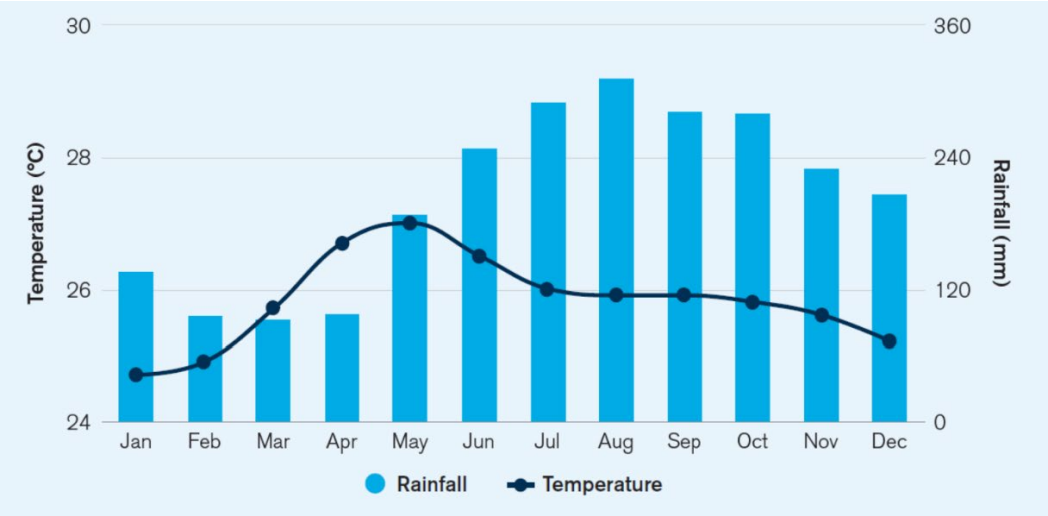

Figure 4: Average monthly temperature and rainfall in the Philippines (1991–2020) (Source: WBG Climate Change Knowledge Portal (CCKP, 2021).

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.

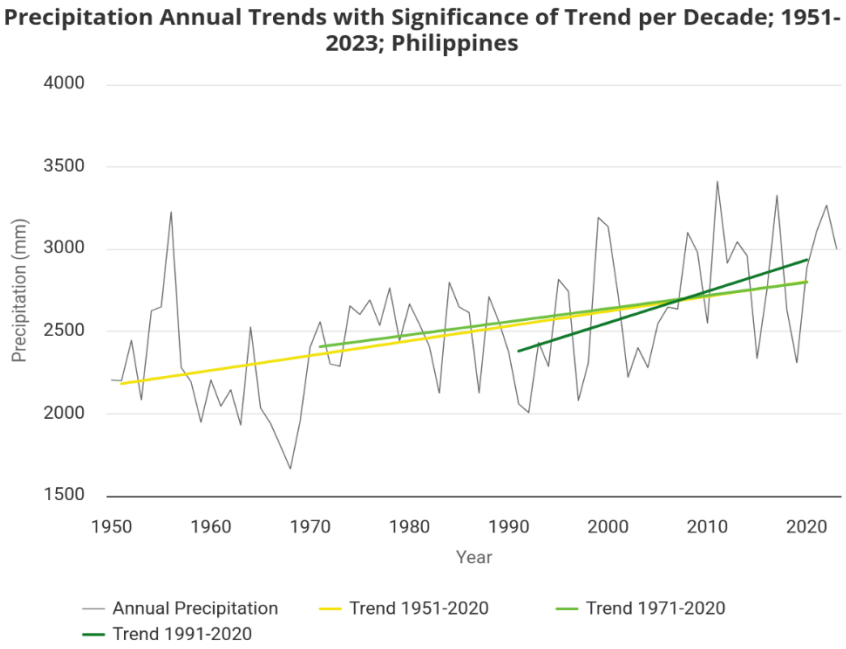

Figure 5: Precipitation Annual Trends with Significance of Trend per Decade (1951-2020) for the Philippines. Source: WBG Climate Change Knowledge Portal

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, especially 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.

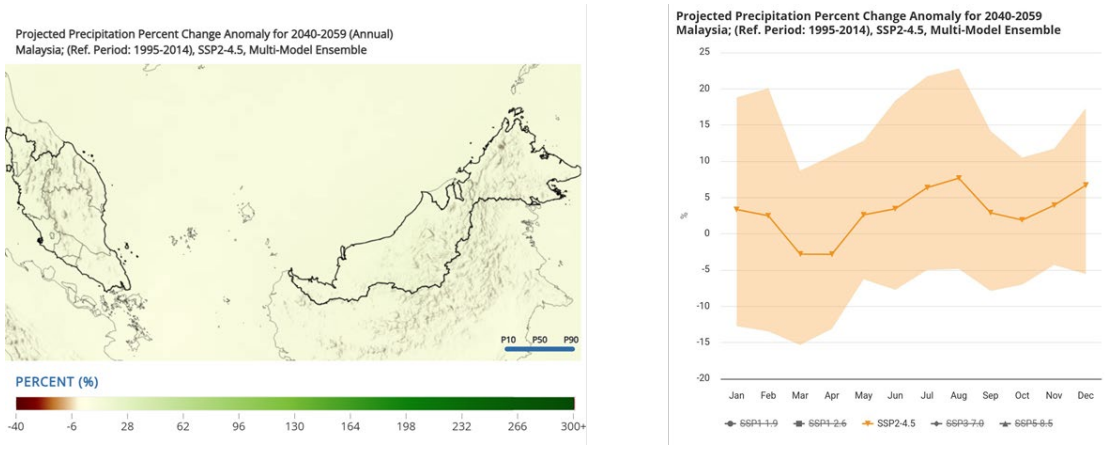

Figure 6: Percentage precipitation change under (a) SSP2-4.5 for 2060 in Malaysia
Source: WBG Climate Change Knowledge Portal

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.

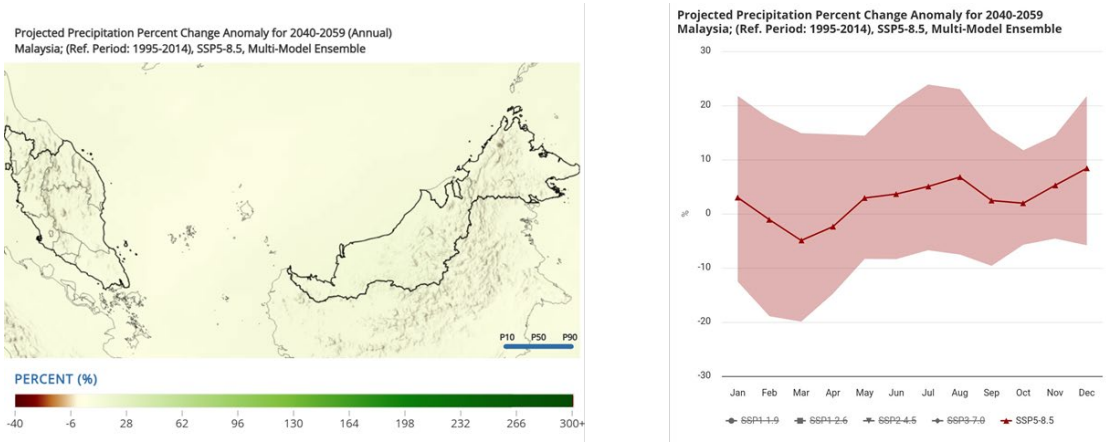

Figure 7: Percentage precipitation change under (a) SSP5-8.5 for 2060 in Malaysia
Source: WBG Climate Change Knowledge Portal

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.

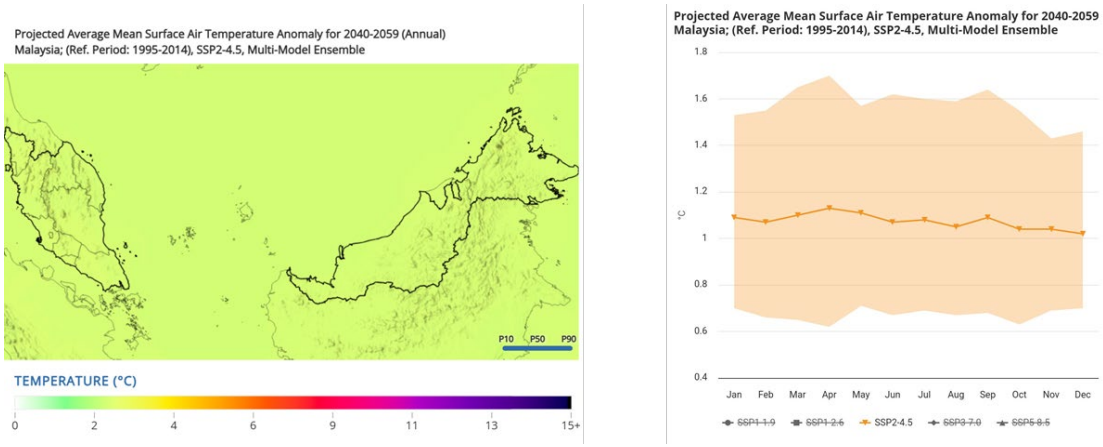

Figure 8: Projected temperature change under (a) SSP2-4.5 for 2060 in Malaysia
Source: WBG Climate Change Knowledge Portal

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.

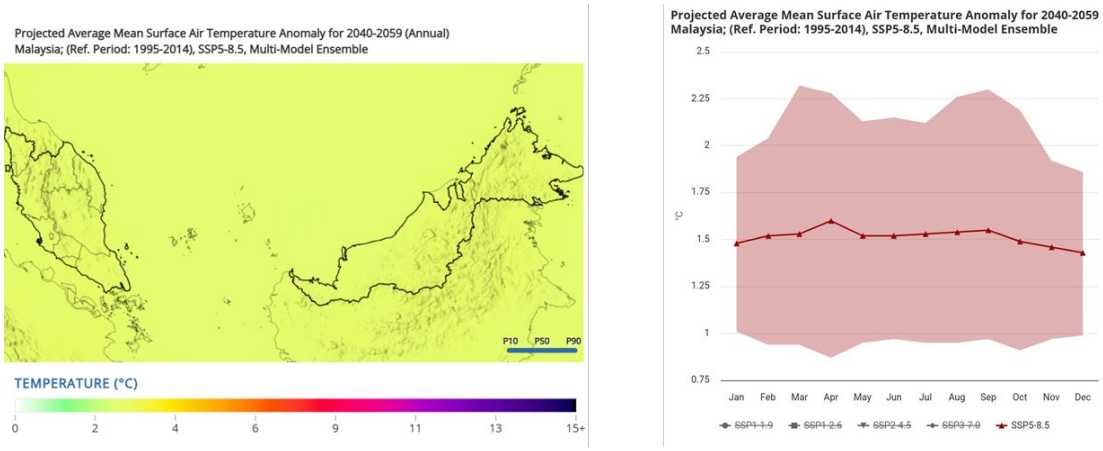

Figure 9: Projected temperature change under (a) SSP5-8.5 for 2060 in Malaysia
Source: WBG Climate Change Knowledge Portal

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.The project is being designed based on SSP2-4.5 with consideration of resilience under SSP5-8.5.

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.

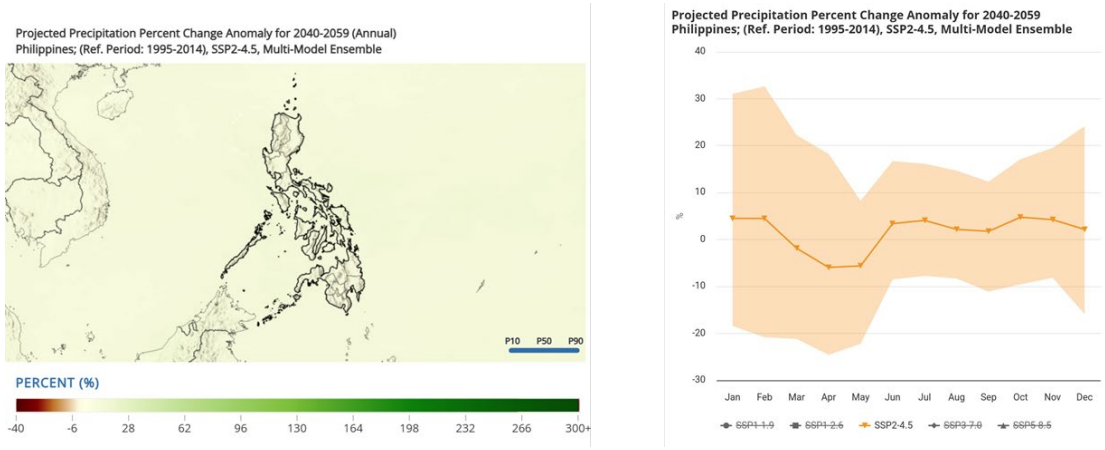

Figure 10: Percentage precipitation change under (a) SSP2-4.5 for 2060 in the Philippines
Source: WBG Climate Change Knowledge Portal

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).

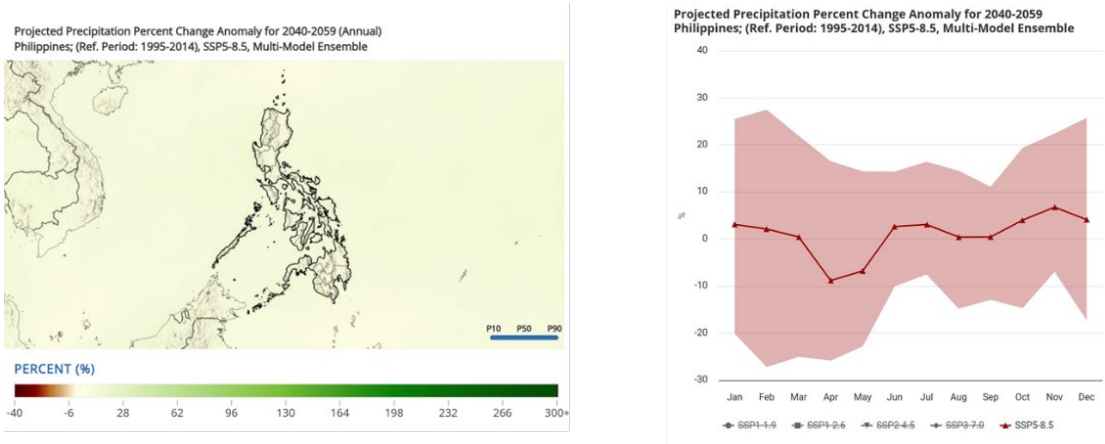

Figure 11: Percentage precipitation change under (a) SSP5-8.5 for 2060 in the Philippines
Source: WBG Climate Change Knowledge Portal

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

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 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.

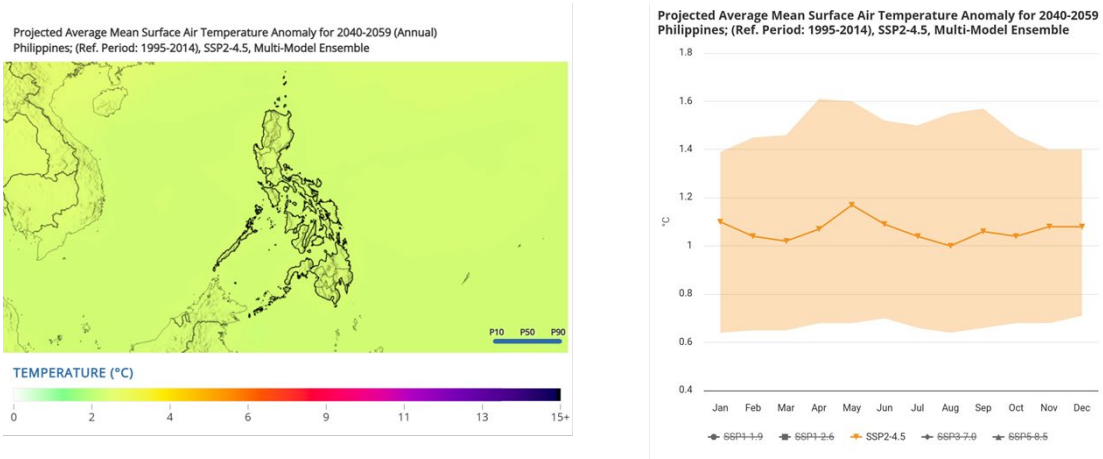

Figure 12: Projected temperature change under (a) SSP2-4.5 for 2060 in the Philippines
Source: WBG Climate Change Knowledge Portal

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.

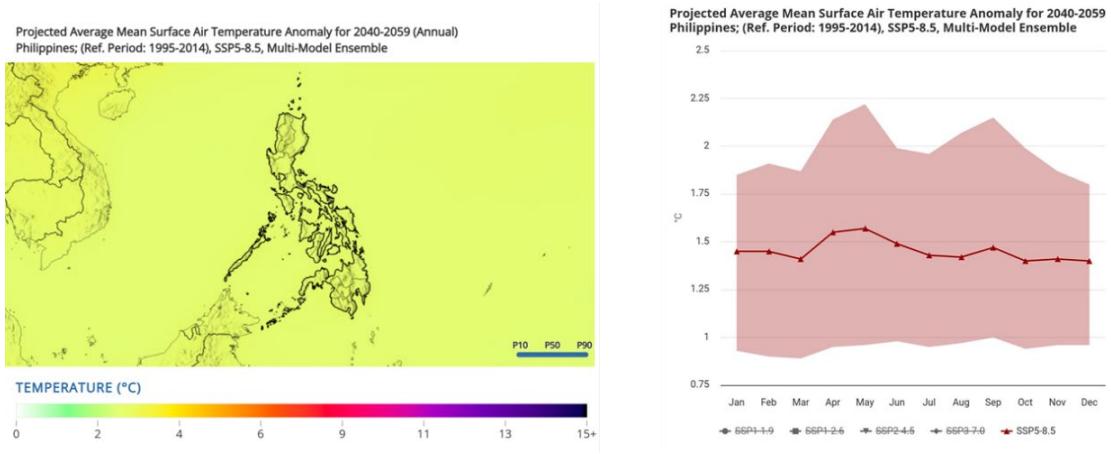

Figure 13: Projected temperature change under (a) SSP5-8.5 for 2060 in the Philippines
Source: WBG Climate Change Knowledge Portal

27. Target locations in the Philippines and Malaysia have been identified to address the climate vulnerabilities of rice farmers, and preliminary data has been gathered through national-level consultations. In Malaysia, the selected locations are in states projected to experience rice productivity losses due to climate impacts, including Kedah, Pulau Pinang, and Sarawak [34,35.] In the Philippines, four proposed target locations are among the top five rice-producing regions most exposed to severe natural hazards: Iloilo, Bukidnon, North Cotabato, and Nueva Ecija[36]. These locations are detailed in Tables 1 and 2.

Table 1 Climate Vulnerabilities of the Target Locations by Province in Malaysia based on the Consultation Workshops

Target Communities	Province	Unique Vulnerabilities	Key Impacts
Farmers in Pendang (MADA area)	Kedah	Water backflow, flooding, droughts, pests	Abandoned fields, economic losses, food insecurity
Farmers in IADA Pulau Pinang	Pulau Pinang	Soft soil, droughts, water scarcity, pests	Unharvested crops, reduced yields, financial strain

[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.

Iban ethnic farmers in Rh. Mancha, Daro	Sarawak	Droughts, pest attacks, lack of irrigation, soil issues	Crop failures, shift to other crops, loss of tradition

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

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

30. The proposed project aligns with all 8 outcomes of the AF Results Framework, as follows:

- Outcome 1. The introduction of climate-resilient rice varieties and sustainable farming techniques will help farmers adapt to changing climates, improving food security and livelihoods.
- Outcome 2. The project emphasizes policy dialogues and capacity-building with research institutions like MARDI, strengthening institutional capacities for effective climate adaptation policies.
- Outcome 3. It targets smallholder rice farmers, especially marginalized groups, by providing training in Climate-Smart Agriculture (CSA) and Good Agricultural Practices (GAP) to foster ownership of adaptation processes.
- Outcome 4. Comprehensive training for farmers and government staff in CSA, market risk management, and water management enhances skills necessary for climate change adaptation.
- Outcome 5. The project aims to create a sustainable agricultural system resilient to climate impacts, benefiting farmers and communities in Malaysia and the Philippines.
- Outcome 6. By bolstering the resilience and market integration of farmer organizations, the project provides a framework for accessing climate finance and diversifying livelihoods.
- Outcome 7. Development of adaptation and investment plans for Agricultural Marketing Services will enhance access to climate finance, promoting resilience measures.
- Outcome 8. The introduction of innovative climate-resilient practices encourages long-term agricultural adaptation strategies.

E. Project/Programme Components and Financing:

Table 3 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 - non-IE executes as EE; Philippines: USD 2 million - IE executes as EE)
	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	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;

for farmers and institutions	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	the Philippines USD 2 million) non-IE executes as EE
		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 - non-IE executes as EE Philippines USD 1.3 million - IE executes as EE)
		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 and Development Institute (MARDI)	Malaysia	
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 non-IE executes as EE
	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))		
7. Project/Programme Execution cost				961,364
8. Total Project/Programme Cost				**12,461,364**
9. Project Cycle Management Fee				**1,246,136**
Amount of Financing Requested				**13,707,500**

Projected Calendar:

Project Duration: 4 years (48 months)

Table 2 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.

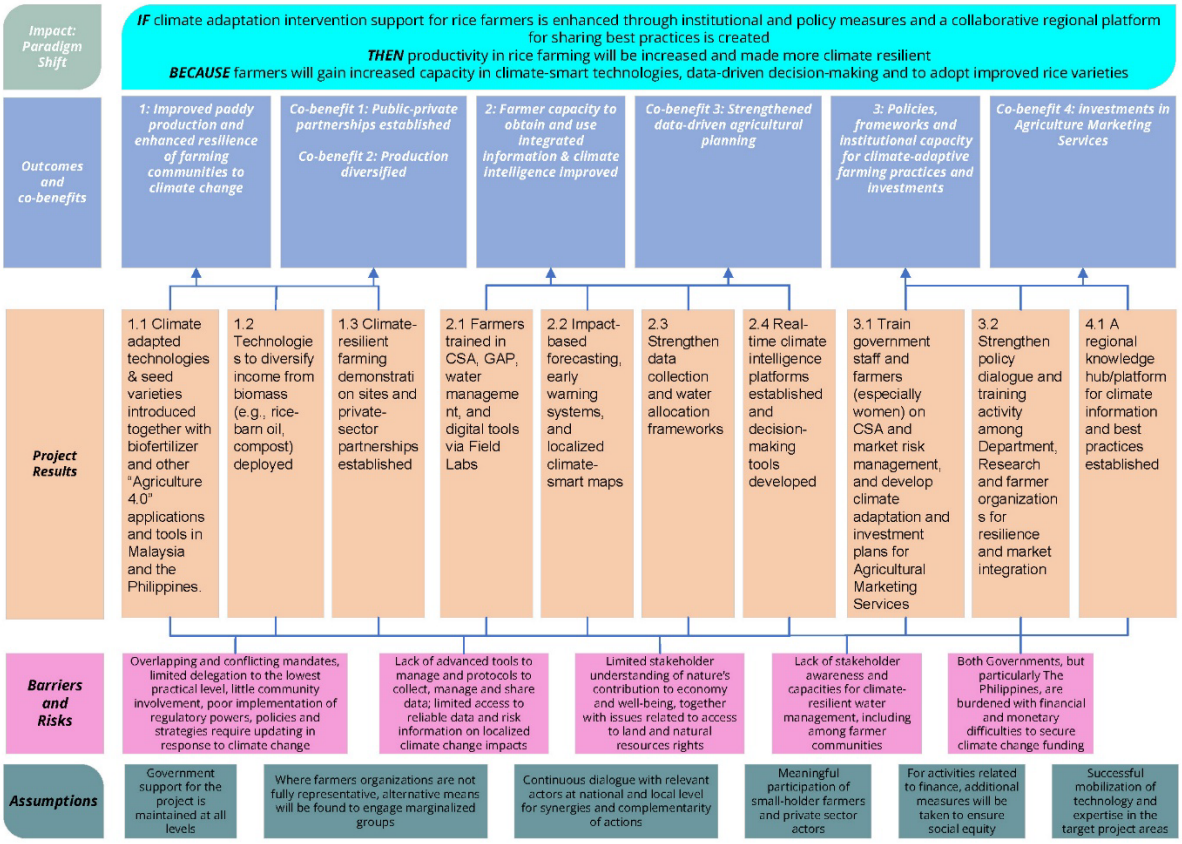

Figure 14: Project Theory of Change (ToC)

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. The work under this component will be effectively prepared and coordinated during implementation with the national agencies and ASEAN, and will learn from and build on regional and national initiatives like the ASEAN framework for disaster risk reduction and CREWS[38] and SERVIR SEA[39] initiatives. 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 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

[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.

[38] "Building Resilience to High-Impact Hydro-meteorological Events through Strengthening Multi-Hazard Early Warning Systems in SIDS and South East Asia" https://crews-initiative.org/news/southeast-asia-strengthens-multi-hazard-early-warning-systems/ and later work in Cambodia and Lao PDR.

[39] SERVIR Southeast Asia https://servir.adpc.net/

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.

59. South-South cooperation among Malaysia, the Philippines aims to enhance agricultural resilience and sustainability in the face of climate change, in line with ASEAN policies. Climate change is a transboundary issue that requires collective action. By collaborating regionally, countries can develop coordinated strategies to address climate impacts, such as droughts and floods, more effectively than through isolated national efforts. The two countries face similar agricultural challenges, such as climate variability, pest outbreaks, and water scarcity. By sharing best practices and successful adaptation strategies, countries can accelerate the learning process and implement effective solutions more rapidly. Regional cooperation allows for the adaptation of successful practices to local contexts, ensuring that interventions are relevant and effective for specific communities. The approach allows the two countries to pool financial, technical, and human resources, leading to more efficient use of available assets. This can result in cost savings and increased impact compared to isolated national interventions. The countries can undertake joint research initiatives, share data, and develop innovative technologies that address common challenges, enhancing agricultural productivity and resilience. It will foster partnerships among governments, NGOs, and private sector actors across borders. These networks can facilitate the exchange of information, resources, and support, creating a more robust agricultural ecosystem. Collaborative efforts can lead to the development of harmonized policies and regulations that could facilitate trade.

60.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[40]. 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

61. 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.

62. 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-

[40] 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).

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))

63. 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.

64. 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.

65. 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

66. 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.

67. 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.

68. 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.

69. Indicative activities and proposed targeted impacts for each of the outputs listed in Table 2: Project components, expected outcomes and outputs, and its estimated financing requirements are given in Table 4.

Table 5: Indicative activities and proposed target impacts for each Expected Output

Project/Programme Components	Expected Outputs	Activity	Impact
1. Medium and large-scale climate-smart agriculture	1.1.1. Climate-resilient rice varieties introduced	Deploy climate-resilient rice varieties in Pendang,	Target a yield increase of at least 20% in drought-

technologies and practices deployed through public-private partnerships to increase and diversify production, and to build the resilience of rice farming communities	together with biofertilizer and other “Agriculture 4.0” applications and tools in Malaysia and the Philippines.	IADA Pulau Pinang, and Neuva Ecija. Introduce biofertilizers to enhance soil fertility in all target locations.	prone areas like Neuva Ecija and Pendang IADA, Pulau Pinang. Aim for 70% of farmers in these regions to adopt these varieties within three years. Achieve a 30% increase in soil organic matter content in Pendang IADA, Pulau Pinang. Reduce irrigation water usage by 15% in Neuva Ecija.
	1.1.2. Deploy technologies to diversify income from biomass (e.g., rice-barn oil, compost)	Implement biomass utilization technologies in all regions to create additional income streams.	Increase household income by 15% through new biomass products.
	1.2.1. Establish climate-resilient farming demonstration sites and private-sector partnerships	Set up demonstration sites in Dumangas, Banate, Oton, Dingle, and Kitaotao to showcase climate-resilient practices.	Increase the adoption of climate-resilient practices by 40% among local farmers.
	1.3.1 Implement climate-smart agriculture techniques in key regions	Apply climate-smart agriculture techniques in Pendang and IADA Pulau Pinang to address local environmental challenges.	Achieve a 15% increase in productivity in targeted regions.
2. Strengthened integrated information & climate intelligence for farmers and institutions	2.1.1. Train farmers in CSA, GAP, water management, and digital tools via Farmer Climate Field Living Labs	Conduct training sessions in all target locations, focusing on CSA, GAP, and water management practices.	Increase knowledge scores of participants by 30% post-training.
	2.2.1. Develop impact-based forecasting, early warning systems, and localized climate-smart maps	Create localized climate-smart maps and early warning systems for farmers in Dumangas and Kitaotao.	Enhance farmers' preparedness for climate impacts, reducing crop losses by 20%.
	2.2.2. Strengthen data collection and water allocation frameworks	Enhance data collection and water allocation frameworks in Pendang and IADA Pulau Pinang.	Improve water allocation efficiency by 25%.
	2.3.1. Establish real-time climate intelligence platforms and decision-making tools	Develop real-time climate intelligence platforms in Pendang to aid decision-making for farmers.	Increase the accuracy of farming decisions by 30%.
3. Institutional capacity building for localized adaptation strategies to create enabling environment for investments in Agriculture Marketing Services	3.1.1. Train government staff and farmers (especially women) on CSA and market risk management	Provide Gender-Responsive Training and increase the participation of women and marginalized groups in training programs across all target locations.	Achieve 50% female participation in training sessions in each location. Empower 60% of women farmers with new skills in CSA and market risk management. Increase participants' knowledge scores by 30% post-training, with a focus on local agricultural practices.

	3.1.2. Develop climate adaptation and investment plans for Agricultural Marketing Services	Create and implement climate adaptation and investment plans tailored to the needs of farmers in each region.	Involve 80% of local stakeholders in planning sessions in each target area. Create and implement seven inclusive adaptation plans across the targeted regions. Increase investment in agricultural services by 20%.
	3.2.1. Strengthen DA-AMIA and farmer organizations for resilience and market integration	Support the strengthening of DA-AMIA and farmer organizations in Dumangas and Kabacan for better market integration.	Enhance market access for farmers by 30%.
	3.3.1. Conduct policy dialogues and capacity buildings with research collaboration (e.g., Malaysian Agricultural Research and Development Institute (MARDI)	Facilitate policy dialogues and capacity-building sessions with MARDI and local stakeholders in Malaysia.	Improve agricultural policies based on research collaboration, impacting 50% of local farmers.
4. Regional knowledge platform for South-South Cooperation	4.1.1. Share best practices, policy recommendations, and results via a regional knowledge hub	Establish a regional knowledge hub to share best practices and policy recommendations across all target locations.	Increase the awareness of best practices by 40% among farmers and stakeholders.
	4.2.1. Support joint demonstrations and cooperation frameworks (e.g., Brunei-Indonesia-Malaysia-Philippines East ASEAN Growth Area (BIMP-EAGA))	Promote joint demonstrations and cooperation frameworks within the BIMP-EAGA initiative to enhance regional collaboration.	Strengthen regional cooperation, leading to a 25% increase in Malaysia-Philippines collaborative projects.

C. Economic, Social, and Environmental Benefits

70. The project is designed to generate economic, social and environmental benefits with a strong focus on supporting vulnerable groups. These include smallholder farmers, particularly those living below national poverty thresholds, women farmers and indigenous communities such as the Iban ethnic group in Sarawak and upland farming communities in Bukidnon and North Cotabato. These groups were identified through national consultations, vulnerability mapping and agricultural data in both countries. Targeting is further guided by socioeconomic indicators and exposure to climate-related risks such as flooding, drought and sea-level rise.

71. It is estimated that total of 128,817 people would benefit directly from the project (24,207 women and 104,610 men). These numbers comprise 9,527 women and 45,892 men in the 3 target locations in Malaysia and 14,680 women and 58,718 men in the 4 target locations in the Philippines (Tables 1a and 1b). These target farmers have been selected based to maximise the potential increase in production and income, while having regard to the needs of the vulnerable, including indigenous people (e.g. the Iban in Sarawak), women farmers, and smallholders. The benefits will be realised through Farmer's Climate Field Living Labs developed and run by the project to introduce climate-resilient agricultural practices, biofertilizers, Agriculture 4.0 technologies, impact-based forecasting and anticipatory action mechanisms, resilient water infrastructure and improved water resources management. More than 95,000 people would benefit indirectly from the project due to knowledge dissemination activities in the 3 provinces in Malaysia and a further

100,000 people in the 4 provinces in the Philippines. An exact breakdown of beneficiaries per components and activities will be provided at the fully developed project proposal stage.

72. The specific climate-smart agricultural technologies and institutional innovations to be introduced at each project location will be determined during project implementation through detailed consultations with farmers at that location to confirm and quantify the climate risks and impacts, and tailor the interventions to minimise those risks and impacts.The findings in the Philippines that "women are on average better educated and more open to changes than men"; "indigenous women have the knowledge and skills that would form the foundation of climate resilient agriculture", and "young women possess digital skills that allow efficient communication of agrometeorological and commercial information necessary for integrating climate resilient agriculture in livelihoods"[41] are relevant to these discussions and implementation decisions. A study of 300 farmers in Malaysia found that "access to extension, income, knowledge about climate change, household size and farm size affect the decision to adopt any adaptation strategies or not".[42] will be used in communicating project objectives and developing intervention strategies and actions.

73. Environmental benefit: By promoting CSA practices, the project is expected 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.

74. 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. Research studies suggest that in the lower productivity areas, such as Dumangas, Banate, Oton, and Dingle, in Iliolo province and Kitaotao, and Damulog in Bukidnon province, increases in yield of 2 metric tons per hectare can be expected with improved agricultural practices. 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.

75. 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

[41] GCF-FAO Project "Adapting Philippine Agriculture to Climate Change", Annex 8, Gender Assessment. page 9 https://www.greenclimate.fund/sites/default/files/document/fp201-gender-assessment.pdf

[42] Afroz, R. and Akhtar, R. 2017. Determinants of Malaysian Farmers' Choice of Adaptation Strategies for Adapting to Climate Change in Kedah Malaysia. Asian Journal of Agricultural Research. https://scialert.net/fulltext/?doi=ajar.2017.120.127

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.

76. 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.

77. 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.

78. The regional collaboration proposed in this project facilitates the sharing of knowledge and best practices, reducing the need for each country to develop its own training programs or research initiatives from scratch. Countries can learn from each other's successes and failures, resulting in more effective implementation of various strategies. Collaborative research can foster innovations that benefit all participating countries, enhancing the overall effectiveness of interventions. Additionally, the proposed regional data collection systems and climate intelligence platforms can be more cost-effective than separate systems for each country. A regional approach can lead to the development of coherent policies that support climate-smart agriculture across borders, making it easier for farmers to adopt new practices. The common elements in the NDCs and adaptation plans of Malaysia and the Philippines highlight the importance of the regional approach. These common elements include improved waste management practices and sustainable land use, both of which are key areas for this project. A unified approach to policy and regulation can also promote regional marketing and strengthen supply chains. By establishing common metrics for

success, monitoring and evaluation of the project across the two countries can lead to improved accountability and learning.

E. Cost-effectiveness of the proposed project

79. 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.

80. 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.

81. 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. The cost-effectiveness of the proposed project is demonstrated in Table 6.

Table 6 Indicative cost and benefit of the project

Project Component	**Business-as-Usual (BAU) Scenario**	**Scenario with Proposed Project Interventions**	**Cost (USD)**	**Estimated Beneficiaries**
1. Medium and large-scale climate-smart agriculture technologies and practices deployed through public-private partnerships to increase and	Malaysia Yield 5.03 t/ha Annual production 639,602 tonnes	Malaysia Yield 6.5 t/ha Annual production 735,543 t	5,000,000 Malaysia: USD 3 million	Malaysia 55,419 (45,892 M 9,527 F) Philippines 73,398 (58,718 M 14,680 F)
	Philippines Yield 3.8 t/ha	Malaysia Biomass income/farmer USD180 Total income		

diversify production, and to build the resilience of rice farming communities		USD9,975,000		
	No income from biomass waste	Philippines Yield 4.4 t/ha Annual production 450,000 t	Philippines: USD 2 million	
		Philippines Biomass income/farmer USD150 Total income USD11,010,000		
2. Strengthened integrated information & climate intelligence for farmers and institutions	Average annual yield loss in Malaysia 1.5 t/ha	Average annual yield loss in Malaysia 1.2 t/ha	3,500,000 Malaysia: USD 1.5 million	
	Average annual yield loss in the Philippines 1.7 t/ha	Average annual yield loss in the Philippines 1.4 t/ha	Philippines: USD 2 million	
3. Institutional capacity building for localized adaptation strategies to create enabling environment for investments in Agriculture Marketing Services	Malaysia: Women farmer's average income: USSD 1,500/annum	Malaysia: Women farmer's average income: USSD 1,800/annum Benefit of women's training USD863,400	2,500,000 Malaysia: USD 1.2million	
	Philippines: Women farmer's average income: USSD 1,200/annum	Philippines: Women farmer's average income: USSD 1,440/annum Benefit of women's training USD1,056,960		
	Malaysia: Market access and production both limit income	Malaysia: Market access is improved by 30%. Production improved and losses reduced by Components 1 & 2. Farmer's income is increased to USD 1560 Total beneficiary income is USD86,454,000	Philippines: USD 1.3 million	
	Philippines: Market access and production both limit income	Philippines: Market access is improved by 30%		

		Production improved and losses reduced by Components 1 & 2. Farmer's income is increased to USD1300 Total beneficiary income is USD95,417,000		
4. Regional knowledge platform for South-South Cooperation	Limited awareness of best practices among farmers and stakeholders	Awareness of best practices among farmers and stakeholders increased by 40%	USD 500,000	
	Few collaborative projects	A 25% increase in Malaysia-Philippines collaborative projects.		

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

83. 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)[43], 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)[44] 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.

84. For the Philippines, the project aligns appropriately with the Philippines Rice Industry Roadmap 2030[45], 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[46]. The project will also directly support the Philippine Development Plan (PDP) (2023-2028)[47] 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.

85. The Nationally Determined Contributions and National Adaptation Plans for Malaysia and the Philippines are presented in Table 6.

[43] https://napglobalnetwork.org/2025/01/malaysia-sets-course-enhance-resilience-formulation-inclusive-nap/
[44] https://people.utm.my/vani/2021/06/10/climate-change-adaptation-framework-for-water-sector/
[45] https://www.philrice.gov.ph/wp-content/uploads/2018/09/The-Philippine-Rice-Industry-Roadmap-2030.pdf
[46] https://www.germanwatch.org/sites/default/files/2025-02/Climate%20Risk%20Index%202025.pdf
[47] https://pdp.neda.gov.ph/wp-content/uploads/2023/01/PDP-2023-2028.pdf

Table 7 Nationally Determined Contributions and National Adaptation Plans

Country	NDC Target	NDC Policy and planning framework
Malaysia	A 45% reduction in economy-wide carbon intensity against GDP by 2030 compared to 2005 levels. The Long-term goal is to achieve net-zero greenhouse gas emissions by 2050. Sectoral contributions are: i) transition to renewable energy sources, ii) Promotion of public transport and electric vehicles, iii) improved waste management practices, and iv) enhancing forest cover and sustainable land use. Adaptation measures emphasise climate-resilient infrastructure and disaster risk reduction. Engagement in global climate initiatives and partnerships is encouraged.	The National Climate Change Policy 2.0 (2024) guides the transition to a low-carbon economy and encompasses various climate initiatives. The National Climate Change Adaptation Plan outlines strategies for enhancing resilience to climate impacts, with a focus on ensuring sustainable water management, enhancing agricultural resilience, addressing health impacts related to climate change, and protecting ecosystems and natural resources. Malaysia's 11th, 12th and coming 13th Malaysia Plans incorporate climate change strategies. The Energy Efficiency and Conservation Act and the Renewable Energy Act aim to reduce emissions. The forest policy aims at sustainable forest resources, including a target of 50% forest cover. The National Green Technology Policy promotes green technology.
The Philippines	A 75% reduction and avoidance of emissions by 2030, with 2.71% being unconditional and 72.29% conditional. The commitments include agriculture, waste, industry, transport, and energy sectors. An update is in progress with a target of September 2025. Sectoral contributions are: i) transition to renewable energy and energy efficiency, ii) sustainable transport systems, iii) climate-smart agricultural practices, and iv) enhanced waste management strategies. A monitoring and reporting framework is established. Local communities and stakeholders will be involved in implementation.	The Climate Change Act of 2009, which created the Climate Change Commission and specified development of the National Climate Change Action Plan for 2011-2028 (NCCAP) guides climate actions. The Philippine Development Plan integrates climate change considerations into national development planning. The Local Government Code empowers local government units (LGUs) to implement climate actions. The Philippine Energy Plan outlines the country's energy transition towards renewable sources. The National Disaster Risk Reduction and Management Plan focuses DRR on climate change impacts. The impacts of climate change on women are recognised in the NCCAP, and by The Philippine Commission on Women.
	Adaptation planning	
Malaysia	The National Adaptation Plan is under development with GCF funding. It is expected to be completed in 2026. The Plan will address resource and environmental management and infrastructure development, as well as DRR. The Solid Waste Management and Public Cleansing Act 2007 aims to improve waste management practices by waste segregation, diversion from landfill, and extended producer responsibility.	
The Philippines	The National Adaptation Plan will build climate resilience by outlining strategic actions to minimize climate risks and integrate adaptation into national and local development planning. It aims to improve water security, increase agricultural resilience and food security, and protect and restore ecosystems. Training and resources for local governments and communities are planned to increase capacity. The Ecological Solid Waste Management Act of 2000 targets 35% recycling by 2025 through community-based programs, waste-to-energy projects, and plastic waste reduction.	

86. At a broader level, the project will also contribute to the ASEAN Climate Resilience Network (ACRN)[48] 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

[48] https://asean-crn.org/

supporting the region's strategic goals for food security and climate resilience, including those outlined in the Action Plan for Sustainable Agriculture in ASEAN[49]. The project also aligns with the ASEAN Guidelines on Promoting Climate-Smart Agriculture Practices (2021)[50] 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[51] through South-South cooperation that emphasizes regional sustainability, climate action, and economic integration to achieve long-term food security.

87. Beyond regional frameworks, the project also aligns well with global commitments such as the United Nations Sustainable Development Goals (SDGs)[52], particularly SDG 2 (Zero Hunger)[53], SDG 13 (Climate Action)[54], and SDG 17 (Partnerships for the Goals)[55]. 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 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.

88. 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.

89. 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)[56], 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[57], ensuring that all interventions consider environmental risks and mitigation measures.

90. 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[58] 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.

[49] https://asean.org/wp-content/uploads/2024/11/Action-Plan-for-Sustainable-Agriculture__.pdf
[50] https://asean.org/wp-content/uploads/2022/10/2023_ASEAN-Guidelines-on-the-Promotion-of-CSA-Practices-Vol-3_adopted.pdf
[51] https://asean.org/wp-content/uploads/2021/08/ASEAN-Vision-2040-Volume-1.pdf
[52] https://sdgs.un.org/goals
[53] https://sdgs.un.org/goals/goal2
[54] https://sdgs.un.org/goals/goal13
[55] https://sdgs.un.org/goals/goal17
[56] https://www.env.go.jp/en/recycle/asian_net/Country_Information/Law_N_Regulation/Malaysia/Malaysia_mal13278.pdf
[57] https://faolex.fao.org/docs/pdf/phi19235.pdf
[58] https://www.kpkm.gov.my/images/04-dasar-agromakanan/national_agrofood_policy_2021-2030_nap%202.0.pdf

91. 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[59, 60], ensuring that information is accurate, timely, and actionable for farmers.

Table 8 National Technical Standards and Compliance

Standard	Description	Compliance Measures
Environmental Impact Assessment (EIA)	A legal requirement in both Malaysia and the Philippines to assess the potential environmental impacts of proposed projects.	The project will conduct a comprehensive EIA to identify potential environmental impacts and propose mitigation measures. This will involve stakeholder consultations and adherence to local EIA guidelines.
Water Use Regulations	Regulations governing the use and management of water resources to ensure sustainable practices.	The project will implement water management practices that comply with national water use regulations, including efficient irrigation techniques and water conservation measures. Regular monitoring will ensure compliance with water quality standards.
Agricultural Input Standards	Standards for fertilizers, pesticides, and other agricultural inputs to ensure safety and efficacy.	The project will utilize only approved agricultural inputs that meet national standards. Training sessions will educate farmers on the proper use of biofertilizers and other inputs, ensuring compliance with safety regulations.
Climate Change Adaptation Policies	National policies aimed at enhancing resilience to climate change impacts.	The project will align its activities with national climate adaptation strategies, incorporating climate-smart agriculture practices that are recognized by local authorities. Regular reporting will ensure adherence to these policies.
Biodiversity Conservation Regulations	Laws aimed at protecting biodiversity and ecosystems.	The project will assess potential impacts on local biodiversity and implement measures to protect sensitive ecosystems. This includes selecting climate-resilient rice varieties that are compatible with local biodiversity.
Land Use Planning Regulations	Regulations governing land use to ensure sustainable development.	The project will comply with local land use plans and zoning regulations, ensuring that agricultural practices are compatible with regional development goals. Engagement with local authorities will facilitate compliance.
Health and Safety Standards	Standards to ensure the health and safety of workers and communities involved in agricultural practices.	The project will implement health and safety protocols during training and field activities, including the use of personal protective equipment (PPE) and adherence to safe handling practices for agricultural inputs.

[59] https://library.wmo.int/viewer/69085/download?file=Global-Status-of-MHEWS-2024_en.pdf&type=pdf&navigator=1
[60] https://community.wmo.int/en/impact-based-forecast-and-warning-services

Data Protection and Privacy Regulations	Laws governing the collection and use of personal data, especially in digital tools and platforms.	The project will ensure that any data collected from farmers for climate intelligence platforms complies with national data protection laws, including obtaining consent and ensuring data security.

List of regulations by country:

Malaysia	Philippines
Environmental Impact Assessment (EIA): Governed by the Environmental Quality Act 1974, requiring EIA for projects with significant environmental impacts.	Environmental Impact Assessment (EIA): Required under the Philippine Environmental Impact Statement System, which mandates EIA for various projects.
Water Use Regulations: Managed under the National Water Resources Policy, focusing on sustainable water management.	Water Use Regulations: Governed by the Water Code of the Philippines, focusing on sustainable water resource management.
Agricultural Input Standards: Regulated by the Pesticides Act 1974 and the Fertilizers Act 1976, ensuring safety and efficacy of agricultural inputs.	Agricultural Input Standards: Regulated by the Fertilizer and Pesticide Authority, ensuring the safety of agricultural inputs.
Climate Change Adaptation Policies: Aligned with the National Policy on Climate Change, promoting climate-resilient practices.	Climate Change Adaptation Policies: Aligned with the Climate Change Act of 2009, promoting adaptation strategies.
Biodiversity Conservation Regulations: Governed by the Wildlife Conservation Act 2010 and the National Biodiversity Policy.	Biodiversity Conservation Regulations: Governed by the Wildlife Resources Conservation and Protection Act.
Land Use Planning Regulations: Managed by local planning authorities under the Town and Country Planning Act 1976.	Land Use Planning Regulations: Managed by local government units under the Local Government Code.
Health and Safety Standards: Governed by the Occupational Safety and Health Act 1994.	Health and Safety Standards: Governed by the Occupational Safety and Health Standards (OSHS).
Data Protection and Privacy Regulations: Governed by the Personal Data Protection Act 2010.	Data Protection and Privacy Regulations: Governed by the Data Privacy Act of 2012.

Implementation Strategies

- Stakeholder Engagement: Regular consultations with local communities, government agencies, and stakeholders will ensure that all standards are understood and adhered to.
- Training and Capacity Building: Providing training for farmers and local authorities on compliance with these standards will enhance understanding and implementation.
- Monitoring and Reporting: Establishing a monitoring framework to regularly assess compliance with all applicable standards, with periodic reporting to relevant authorities.

92. 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 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.

93. 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[61]. The work with the concerned national agencies in the following stages of project formulation will include comprehensive consideration of coordination, collaboration, and learning with relevant projects, for which preliminary lists are provided in Tables 7, 8 and 9.

94. 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.

95. 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[62]" 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.

96. 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.

Table 9 Relevant Current and Planned Projects in ASEAN, Malaysia and the Philippines

Project Name	Description	Countries Involved	Funding Source	Status
Sustainable Low-Emission Rice Initiatives	Focuses on sustainable rice production practices to reduce emissions and enhance resilience.	Malaysia, Vietnam	Green Climate Fund	Ongoing

[61] 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.

[62] https://www.greenclimate.fund/project/fp201

Climate-Smart Agriculture Initiatives	Promotes CSA practices to enhance productivity and resilience among smallholder farmers.	Various ASEAN countries	FAO and partners	Ongoing
ASEAN Climate Resilience Network (ASEAN-CRN)	A network that supports regional cooperation in climate-smart agriculture and resilience building.	All ASEAN member states	Various partners	Ongoing
Regional Measurement Hubs	Established in the Philippines and Vietnam to measure agricultural greenhouse gas emissions and support climate-smart practices.	Philippines, Vietnam, Laos, Cambodia	New Zealand Government	Ongoing
ASEAN Negotiating Group for Agriculture (ANGA)	Focuses on shaping regional policy frameworks for climate-smart agriculture.	All ASEAN member states	Various partners	Ongoing
ASEAN Green Bonds for Sustainable Agriculture	Initiative to mobilize financial resources for sustainable agricultural practices.	Various ASEAN countries	Various partners	Planned
Joint Demonstrations and Cooperation Frameworks	Supports regional collaboration on climate-smart agriculture practices.	Brunei, Indonesia, Malaysia, Philippines	Various partners	Planned

Malaysia:

Project Name	**Description**	**Funding Source**	**Status**
National Agro-Food Policy 2.0 (NAP 2.0)	Aims to enhance food security and promote sustainable agricultural practices, including climate-smart agriculture.	Malaysian Government	Ongoing
Malaysian Agricultural Research and Development Institute (MARDI) Initiatives	Focuses on research and development of climate-resilient crops and sustainable farming practices.	Government and private sector	Ongoing
Agroecology Transition in Malaysia	Promotes agroecological practices to enhance resilience and sustainability in agriculture.	Various donors	Planned
Sustainable Agriculture Program	Supports farmers in adopting sustainable practices, including water management and organic farming.	Government and NGOs	Ongoing
AgTech International Expo & Seed Asia 2025	A platform for showcasing innovations in sustainable agriculture and climate-smart technologies.	Various sponsors	Planned

Philippines:

Project Name	Description	Funding Source	Status
Philippine Climate Change Adaptation Project	Aims to enhance the adaptive capacity of communities and promote climate-smart agricultural practices.	Government and international donors	Ongoing
Climate Resilient Agriculture Office (DA-CRAO)	Focuses on implementing climate-resilient practices in agriculture and providing support to farmers.	Department of Agriculture	Ongoing
~~New Zealand Climate Smart Agriculture Initiative~~	~~Supports the Philippines in improving greenhouse gas inventory and developing emissions factors for livestock.~~	~~New Zealand Government~~	~~Ongoing~~
DOST-JST Call on Smart Agriculture 2025	A collaborative initiative between Japan and the Philippines to promote smart agriculture through research and technology.	Japan Science and Technology Agency and DOST	Planned
Philippine Statistics Authority (PSA) Initiatives	Enhances data collection and analysis for agricultural policies, including climate-smart practices.	Government	Ongoing

Table 10 Current and Planned Projects on EWS, DRR and and Climate/Weather Advisory Services for Farmers

Project Name	Description	Countries Involved	Funding/Support
Multi-Hazard Impact-Based Forecasting and Early Warning System	This project aims to strengthen the Philippines' ability to adjust to climate impacts and implement long-term climate risk reduction and adaptation measures. It focuses on building a multi-hazard early warning system linked with forecast-based action.	Philippines	Supported by the Green Climate Fund
Regional Project for Early Warnings in Southeast Asia	A project that enhances early warning systems in Southeast Asia, focusing on collaboration between government agencies and local organizations to improve forecasting and preparedness for climate-related hazards.	Southeast Asia (including Malaysia and the Philippines)	Funded by the World Meteorological Organization and the World Bank
South Asia Hydromet Forum (SAHF)	Although primarily focused on South Asia, this forum facilitates knowledge exchange and capacity building for meteorological services, which can benefit regional collaboration, including Malaysia and the Philippines.	South Asia (with potential relevance for Southeast Asia)	Supported by the World Bank
Reinforcing Capacities of Meteorological and Hydrological Services	This initiative aims to strengthen EWS in Cambodia and Lao PDR, showcasing tools and policy-making priorities that could be adapted for use in Malaysia and the Philippines.	Cambodia, Lao PDR (with implications for regional practices)	Funded by the Climate Risk and Early Warning Systems (CREWS) Initiative

Some early complementarity has been identified between the proposed project and other initiatives in the region. For instance, the project complements the FAO-supported Climate-Resilient Agriculture initiatives in the Philippines, aligns with regional efforts under the ASEAN Climate Resilience Network (ACRN) and is thematically relevant to IRRI's work on climate-smart rice production. A full assessment of potential overlaps, complementarities and opportunities for synergies will be carried out during full proposal development, based on further stakeholder consultations and coordination with relevant implementing partners and government counterparts.

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

97. 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 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. To ensure inclusive access, knowledge products will also be made available through local agricultural extension services, printed materials in local languages and mobile delivery channels. Where digital access is limited, in-person outreach and training through the Living Labs will help bridge the gap. In the Philippines, data from Ricelytics[63] indicates that smartphone penetration in target areas exceeds 80%, which combined with appropriate training will support direct delivery of digital information to farmers.

98. 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-

63 https://ricelytics.philrice.gov.ph/

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. To ensure lessons are consistently captured, project partners will use standardized reporting templates for all training activities, field demonstrations and platform contributions. These will feed into a monitoring process managed through the Regional Knowledge Platform, enabling continuous tracking and refinement of learning content.

J. Consultative process undertaken during project preparation

99. 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.

100. 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.

101. 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.

102. 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.

103. 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.

104. 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.

105. 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.

106. 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.

107. 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.

108. 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

109. 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.

110. To ensure long-term maintenance and sustainability, the project will work with relevant ministries and sub-national authorities to explore the integration of Farmer Climate Field Living Labs, early warning systems and decision-support tools into existing extension services and national agricultural programs. Where appropriate, these services may be supported through co-financing mechanisms, such as allocations from local government budgets or partnerships with private-sector actors. The project will also assess opportunities for sustainable financing mechanisms during the full proposal phase, including cost-sharing, revolving funds, or service-based models. The adaptation benefits most likely to be sustained include the adoption of improved rice varieties, strengthened water allocation frameworks, and farmer capacity in climate-smart practices. These can be scaled and replicated in other regions through national extension services and the regional platform under the BIMP-EAGA initiative, with best practices and training modules developed during the project made available to policymakers, cooperatives, and technical agencies.

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

1112. 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.

112. 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.

113. 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.

114. In both Malaysia and the Philippines, women play a critical role in the agricultural sector, particularly in smallholder rice production. However, they continue to face structural and socio cultural barriers such as limited land tenure, lower participation in agricultural extension services and restricted access to climate information and finance. In the Philippines, the Magna Carta of Women provides a legal basis for advancing gender equality while Malaysia's National Policy on Women and Gender Mainstreaming Framework aim to strengthen institutional mechanisms for women's empowerment. Despite these commitments implementation challenges persist, particularly in rural farming communities. The project design responds to these realities by integrating gender-responsive measures across all components. These include prioritizing women's participation in Farmer Climate Field Living Labs, ensuring equitable access to climate-smart technologies and information and supporting women-led farming groups through tailored training and capacity-building. A more detailed gender and social inclusion analysis will be conducted during full proposal development to guide interventions and establish inclusive monitoring indicators, ensuring alignment with the Adaptation Fund's Gender Policy.

115. Following the preliminary environmental and social screening, the project has been classified as Category B, as it is expected to involve moderate environmental and social risks that can be effectively mitigated. To further elaborate and validate these risks, a comprehensive Environmental and Social Impact Assessment (ESIA) will be undertaken during the full proposal development stage. This assessment will inform the design of a detailed Environmental and Social Management Plan (ESMP), which will outline appropriate risk mitigation and monitoring measures. In addition, the ESIA will examine potential direct, indirect, cumulative, and transboundary impacts, particularly those related to agricultural inputs, water resource management and cross-border knowledge exchange to ensure that safeguards are fully integrated into project implementation and that risks are appropriately addressed.

Table 11 Project compliance in line with Adaptation Fund Environmental and Social Principles

Checklist of environmental and social principles[64]	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 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

[64] 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[64]	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
		labour standards as identified by the International Labour Organization (ILO)[65]. 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. 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

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

Checklist of environmental and social principles[64]	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
		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

116. 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.

117. 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.

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

119. **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).

120. **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

121. 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.

122. 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)

123. 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

124. 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.

125. 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[66]

Table 12 Aligning the project with the Results Framework of Adaptation Fund

Project Component[67]	Project Indicator(s)	Fund Outcome	Fund Outcome Indicator	Grant Amount (USD)
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.		1: Reduced exposure to climate-related hazards and threats	1. People using improved climate-related threat and hazard information [# of individuals, by gender]	**12,461,364** **13,707,50013 Including Project Cycle Management Fee**
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	Target a yield increase of at least 20% in drought-prone areas like Neuva Ecija and Pendang IADA, Pulau Pinang. Aim for 70% of farmers in these regions to adopt these varieties within three years. Achieve a 30% increase in soil organic matter content in Pendang IADA, Pulau Pinang. Reduce irrigation water usage by 15% in Neuva Ecija.	2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses	2: Institutions with strengthened capacity to understand and better address climate risks and resilience [# of institutions, disaggregated by scale and sector]	**5,000,000 (Malaysia: USD 3 million Philippines: USD 2 million)**
		3: Strengthened awareness and ownership of adaptation and climate risk reduction processes	N/a	
		4: Increased adaptive capacity within relevant development sector services and infrastructure assets	Core Indicator 4: Physical assets improved or constructed to withstand climate variability and change[68]	

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

[67] The AF utilized OECD/DAC terminology for its results framework. Project proponents may use different terminology but the overall principle should still apply

[68] Core Indicator 4: This indicator measures the improvement or construction of physical assets to withstand climate variability and change. While the project does not involve physical infrastructure, it indirectly supports this indicator by enhancing the capacity of agricultural services to adapt to climate impacts, which can lead to better management of existing infrastructure.

	Increase household income by 15% through new biomass products. Increase the adoption of climate-resilient practices by 40% among local farmers. Achieve a 15% increase in productivity in targeted regions.		[disaggregated by km of linear infrastructure and # of point infrastructure, and by sector]	
2. Strengthened integrated information & climate intelligence for farmers and institutions	Increase knowledge scores of participants by 30% post-training. Enhance farmers' preparedness for climate impacts, reducing crop losses by 20%. Improve water allocation efficiency by 25%. Increase the accuracy of farming decisions by 30%.	5: Increased ecosystem resilience in response to climate change and variability-induced stress	Core Indicator 5: Ecosystems and natural resources brought under protection, restoration, or improved management in response to climate variability and change [# of hectares, disaggregated by land, marine, coastal, and cultural heritage area]	3,500,000 (Malaysia USD 1.5 million: the Philippines USD 2 million)
3. Institutional capacity building for localized adaptation strategies to create enabling environment for investments in Agriculture Marketing Services	Achieve 50% female participation in training sessions in each location. Empower 60% of women farmers with new skills in CSA and market risk management. Increase participants' knowledge scores by 30% post-training, with a focus on local agricultural practices. Involve 80% of local stakeholders in planning sessions in each target area. Create and implement seven inclusive adaptation plans across the targeted regions. Increase investment in agricultural services by 20%. Enhance market access for farmers by 30%.	6: Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas	6.1: People adopting improved and/or new climate-resilient livelihood practices [# of people, disaggregated by gender] Core Indicator 6.2: Households with increased income, or avoided decrease in income [# of households, disaggregated by # of female-headed households]	**<u>2,500,000 (Malaysia: USD 1.2million Philippines: USD 1.3 million)</u>**

	Improve agricultural policies based on research collaboration, impacting 50% of local farmers.			
4. Regional knowledge platform for South-South Cooperation	Increase the awareness of best practices by 40% among farmers and stakeholders. Strengthen regional cooperation, leading to a 25% increase in Malaysia-Philippines collaborative projects.	Outcome 7: Improved policies and regulations that promote and enforce resilience measures	7: Policies, strategies, and/or plans adopted, implemented, and/or enforced that integrate climate risk and resilience considerations [#, disaggregated by scale and by policy step, i.e., developed, adopted, implemented, enforced]	**<u>500,000</u>**
		8: Innovation for effective, long-term adaptation to climate change accelerated, encouraged, and enabled to scale up	8.1: Innovations successfully reaching scale up that demonstrate local innovation participation and/or local innovation benefit [# of innovations]	
			8.2: Institutions created and/or enabled that lead on innovation for adaptation to climate change [# of institutions, disaggregated by scale]	
Project Outcome(s)	**Project Indicator(s)**	**Fund Output**	**Fund Output Indicator[69]**	**Grant Amount (USD)**
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.		1.2: Targeted population groups covered by warning and advisory services for climate-related hazards and threats	Core Indicator 1.2.1: Early warning systems established or improved <u>[# of systems, disaggregated by hazard and scale]</u>	<u>12,410,000</u> 13,651,000 <u>Including</u> Project Cycle Management Fee

[69] The indicators are from the table below para 20 in https://www.adaptation-fund.org/wp-content/uploads/2025/03/AFB.B.44.11-Update-to-the-Strategic-Results-Framework-of-the-Adaptation-Fund.pdf

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	Target a yield increase of at least 20% in drought-prone areas like Neuva Ecija and Pendang IADA, Pulau Pinang. Aim for 70% of farmers in these regions to adopt these varieties within three years. Achieve a 30% increase in soil organic matter content in Pendang IADA, Pulau Pinang. Reduce irrigation water usage by 15% in Neuva Ecija. Increase household income by 15% through new biomass products. Increase the adoption of climate-resilient practices by 40% among local farmers. Achieve a 15% increase in productivity in targeted regions.		1.2.2: People covered by new or improved early warning systems [# of people, disaggregated by gender]	5,000,000 (Malaysia: USD 3 million Philippines: USD 2 million)
2. Strengthened integrated information & climate intelligence for farmers and institutions	Increase knowledge scores of participants by 30% post-training. Enhance farmers' preparedness for climate impacts, reducing crop losses by 20%. Improve water allocation efficiency by 25%. Increase the accuracy of farming decisions by 30%.	2.1: Strengthened capacity of institutions to understand and better address climate risks	2.1.1: Institutions supported to strengthen capacity to understand and address climate risks and resilience [# of institutions, disaggregated by scale and sector]	3,500,000 (Malaysia USD 1.5 million: the Philippines USD 2 million)
		2.2: Increased readiness and capacity of national and sub-national entities to directly access and programme adaptation finance	2.2.1: Local organizations receiving funding or other direct support under the locally led adaptation modality [# of institutions]	
3. Institutional capacity building for localized adaptation strategies to create enabling environment for investments in Agriculture Marketing Services	Achieve 50% female participation in training sessions in each location. Empower 60% of women farmers with new skills in CSA and market risk management.	3.1: Targeted population groups participating in adaptation and risk reduction awareness activities	3.1: People with strengthened awareness of climate change risks and how to better address them [# of people, disaggregated by gender]	2,500,000 (Malaysia: USD 1.2million Philippines: USD 1.3 million)

	Increase participants' knowledge scores by 30% post-training, with a focus on local agricultural practices. Involve 80% of local stakeholders in planning sessions in each target area. Create and implement seven inclusive adaptation plans across the targeted regions. Increase investment in agricultural services by 20%. Enhance market access for farmers by 30%. Improve agricultural policies based on research collaboration, impacting 50% of local farmers.		3.1.1: People participating in activities to improve awareness of climate risks and how to address them [# of people, disaggregated by gender, and by vulnerable groups]	
		3.2: Strengthened capacity of national and subnational stakeholders and entities to capture and disseminate knowledge and learning	3.2: People implementing new or improved adaptation actions [# of people, disaggregated by gender]	
			3.2.1: Climate resilience knowledge products and/or tools developed and shared with stakeholders [# of products/tools]	
		3.3: Increased ownership of adaptation and climate risk reduction processes	3.3.1: Number of local institutions and/or communities responsible for decision-making over how adaptation solutions are defined, prioritized, designed, and/or implemented [# of local institutions and/or communities]	
4. Regional knowledge platform for South-South Cooperation	Increase the awareness of best practices by 40% among farmers and stakeholders. Strengthen regional cooperation, leading to a 25% increase in Malaysia-Philippines collaborative projects.	4.1: Vulnerable development sector services and infrastructure assets strengthened in response to climate change impacts, including variability	4.1.1: Development sector services strengthened to respond to climate variability and change [# of sector services, disaggregated by sector and scale]	500,000
		5.1: Vulnerable ecosystem services and natural resource assets strengthened in response to climate change impacts, including variability	Indicator 5.1.1: Ecosystems and natural resources targeted by activities to improve protection, restoration, and/or management [# of resources, by type]	
		6.1: Targeted individual and community livelihood strategies strengthened in relation to climate change impacts, including variability	6.1.1: People receiving targeted support for new and/or improved livelihoods to manage climate risk [# of people, disaggregated by gender and by type of support]	

		7.1: Improved integration of climate-resilience strategies into country development plans	Core Indicator 7.1.1: Policies, strategies, and/or plans developed or adjusted to integrate climate risk considerations [# of policies, strategies, and/or plans, disaggregated by scale]	
			7.1.2: Policies, strategies, and/or plans formulated through the participation of one or more vulnerable groups [# of policies, strategies, and/or plans, disaggregated by scale]	
		8.1: Innovations identified and piloted that collectively enhance local innovation capacity and contribute to the development of local, national and regional adaptation innovation ecosystems	8.1.1: Innovations identified that demonstrate local innovation participation and/or local innovation benefit [# of proposed innovations]	
			8.1.2: Innovations piloted that demonstrate local innovation participation and/or local innovation benefit [# of innovations]	
		8.2: Innovations identified and piloted which build the adaptation innovation evidence-base and institutional capacity	8.2.1: Innovation-focused knowledge products disseminated and/or learning events facilitated that support and enable innovation capacity at a local, national, and/or regional level [# of knowledge products disseminated and/or learning events facilitated]	

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

A. Record of endorsement on behalf of the government[70] *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*

[70] 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.

KEMENTERIAN SUMBER ASLI DAN KELESTARIAN ALAM
MINISTRY OF NATURAL RESOURCES AND ENVIRONMENTAL SUSTAINABILITY
Blok F11, Kompleks F
Lebuh Perdana Timur, Presint 1
62000 PUTRAJAYA
MALAYSIA

Tel : 603-8000 8000
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

ADAPTATION FUND

14 AUG 2025

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

Subject: Justification on UNIDO's Execution Role for Components 1 and 3 in the Philippines under the proposed regional project entitled "Strengthening Climate Resilience and Food Security through South-South Cooperation in Adaptive Rice Production in Malaysia and the Philippines"

Dear Adaptation Fund Board Secretariat:

In my capacity as Designated Authority for the Adaptation Fund in the Philippines, I am writing to provide formal justification on the role of the United Nations Industrial Development Organization (UNIDO) as Executing Entity for Components 1 and 3 in the Philippines under the proposed regional project entitled *"Strengthening Climate Resilience and Food Security through South-South Cooperation in Adaptive Rice Production in Malaysia and the Philippines."*

In particular, Component 1 involves the deployment of medium- and large-scale climate-smart agriculture (CSA) technologies through public-private partnerships, while Component 3 supports institutional capacity building for localized adaptation strategies and investments in agricultural marketing services. UNIDO's role will support the effective execution of these components by providing technical and operational capacity, in close collaboration with Philippine institutions.

This execution arrangement follows a request from the Philippines' Department of Agriculture - Climate Resilient Agriculture Office (DA-CRAO) and reflects a shared understanding of the need for strong technical support to achieve the project's ambitious objectives. UNIDO brings global expertise in climate-resilient agriculture and institutional capacity building and has a strong country presence through its field office in the Philippines, which enables close coordination with national and local stakeholders.

We also confirm that the Department of Agriculture and its relevant agencies will continue to play a central role in implementation, coordination, and oversight. The project remains fully country-driven and aligns with national development and adaptation priorities. UNIDO's execution role is designed to complement national efforts and contribute to long-term institutional strengthening.

We hope this explanation provides the necessary clarifications. Please do not hesitate to reach out should further information be needed.

Thank you.

Very truly yours,

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

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

A. Project Preparation Timeframe

Start date of PFG	November 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	**20,000**	Workshop expenses: US$ 20,000

IE fee (support costs)	IE admin and technical support for project development, monitoring and supervision Compliance assurance	**10,000**	Technical and admin support services.
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 requirements of the Adaptation Fund	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 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		**Date:** 8 August 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	

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">

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: 8 August 2025</td><td>Tel. and email:

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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:

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

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