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**UNITED NATIONS DEVELOPMENT PROGRAMME**  
**PROJECT DOCUMENT**  
**Malaysia**

**Project Title:** Climate Resilient Agriculture: Enhancing the hill paddy industry in Sabah.

**Project Number:**

**Implementing Partner:** Ministry of Agriculture, Fisheries and Food Industry Sabah (MAFFI)

**Start Date:** July 2025

**End Date:** June 2028

**PAC Meeting date:** 11 March 2025

**Brief Description**

This joint UNDP/Government of Malaysia project aims to enhance the hill paddy industry in Sabah, in terms of yield productivity, sustainability and potential for income-generation. This will be done through the introduction of relevant technology combined with traditional practices of hill paddy farmers. Specific consideration will be placed on nature-based solutions in the project methodology for climate adaptation and mitigation purposes. The project further links several related development issues, such as increasing youth participation in the agriculture sector and increasing rural income from agriculture activities.

The project will support the Government's Twelfth Malaysia Plan, National Agrofood Policy (DAN 2.0) 2021-2030, DAN 2.0 Action Plan and Sabah Agriculture Blueprint 2021 – 2030. This project's field interventions will take place at two pilot sites located in Sabah based on the options from several sites as initial proof of concept for scaling up in the next Thirteenth Malaysia Plan. The two sites represent rural communities actively participating in agriculture, both for subsistence and income generation.

After several rounds of consultations from July – December 2024 with agencies and community partners in Sabah and at the National Level, the project will initially test various technology tools and introduce new sustainable practices complementing the traditional practices already in use as part of the climate resilient agriculture initiatives for the hill paddy industry in Sabah. In addition, pathways for upscaling these tools and methods together with downstream income-generating opportunities (e.g. sale of hill rice products and agrotourism) from the pilot sites to multiple locations will be developed. At the end of the project timeline (three years), the project aims to demonstrate relevant technology and practices for hill paddy and enhance the value chain for better income generation.

**Contributing Outcome (UNSDCF, CPD, CPAP, RPD):**

UNSDCF, CPD 2022-2025 and CPAP 2024-2025 Outcome 2: Planet. By 2025, environmental sustainability and resilience are mainstreamed as priorities in the national development agenda, across all sectors and all levels of society.

UNSDCF, CPD 2022-2025 and CPAP 2024-2025 Outcome 3: Prosperity. By 2025, Malaysia is making meaningful progress towards an economy that is inclusive, innovative and sustainable across all income groups and productive sectors.

**Total resources required:**

**Total resources allocated:**

**Unfunded:**

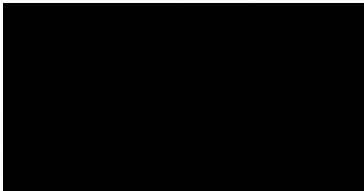

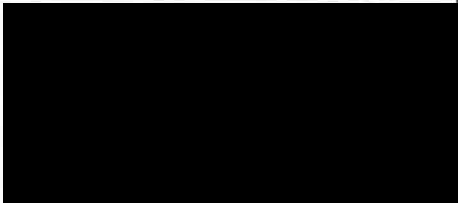



UNDP Strategic Plan 2022-2025 Outcome 1: Structural transformation accelerated, particularly green, inclusive and digital transitions.

CPD 2022-2025 Priorities: Planet — Mainstreaming environmental sustainability and resilience; Prosperity — Promoting an inclusive, innovative and sustainable economy

Twelfth Malaysia Plan Game Changers VII, XI, Pillars: P1 Sources of Economic Growth, P2 Green Growth, P3 Economic Growth Enabler, P5 Inclusivity and wellbeing of Rakyat

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Agreed by (signatures)<sup>1</sup>:

Government	UNDP	Implementing Partner
 <p>Secretary-General Ministry of Economy</p>	 <p>UNDP Resident Representative for Malaysia, Singapore and Brunei Darussalam</p>	 <p>Permanent Secretary Ministry of Agriculture, Fisheries and Food Industry Sabah</p>
Date: 	Date: 	Date: 

<sup>1</sup> Note: Adjust signatures as needed

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## ABBREVIATIONS

<b>AI</b>	Artificial Intelligence
<b>APR</b>	Annual Progress Report
<b>AWP</b>	Annual Work Plan
<b>BDA</b>	Big Data Analytics
<b>DAN 2.0</b>	Malaysia's National Agrofood Policy 2021 – 2030
<b>DIGITAL AGTECH</b>	Digital Agriculture Technology
<b>DOA Sabah</b>	Department of Agriculture Sabah
<b>EPD</b>	Environmental Protection Department Sabah
<b>GIS</b>	Geographical Information System
<b>IOT</b>	Internet Of Things
<b>KE</b>	Ministry of Economy
<b>KePKAS</b>	Ministry of Tourism, Culture and Environment Sabah
<b>KPKM</b>	Ministry of Agriculture and Food Security
<b>LPS</b>	Lembaga Padi dan Beras Sabah
<b>MD</b>	Ministry of Digital
<b>MAFFI</b>	Ministry of Agriculture, Fishery and Food Industry
<b>MDEC</b>	Malaysia Digital Economy Corporation
<b>MIGHT</b>	Malaysian Industry-Government Group for High Technology
<b>MTR</b>	Mid-Term Review
<b>MOF</b>	Ministry of Finance
<b>MOSTI</b>	Ministry of Science, Technology and Innovation
<b>MYPR</b>	Mid-Year Progress Report
<b>MyGAP</b>	Malaysia Good Agricultural Practices Scheme
<b>myORGANIC</b>	Malaysia Organic Certification Scheme
<b>PSC</b>	Project Steering Committee
<b>RP</b>	Responsible Parties
<b>SAB</b>	Sabah Agriculture Blueprint 2021-2030
<b>SaBC</b>	Sabah Biodiversity Center
<b>SBAA</b>	Standard Basic Assistance Agreement
<b>SSL</b>	Self Sufficiency Level
<b>Thirteenth Plan</b>	Thirteenth Malaysia Plan (2026 – 2030)
<b>TRAC</b>	Target for Resource Assignment from the Core
<b>TWC</b>	Technical Working Committee
<b>Twelfth Plan</b>	Twelfth Malaysia Plan (2021 – 2025)
<b>UNDP</b>	United Nations Development Programme
<b>UNSDCF</b>	United Nations Sustainable Development Cooperation Framework, 2021-2025
<b>USMB</b>	Ulu Senagang Mongool Baru

## I. DEVELOPMENT CHALLENGE

### Background on agriculture in Malaysia

Malaysia's agricultural sector (including forestry and fisheries) has contributed to ~8-10% of GDP since 2000<sup>2</sup> with a labour force of ~520,000 (2022)<sup>3</sup>. In 2020, the agrofood sector specifically accounted for around 3.5%, 4% and 4% of GDP, labour force and total exports<sup>4</sup>. A total of 5.63 million hectares of land (accounting for approximately 17% of total land area of Malaysia) is currently used for agrofood cultivation. However, Malaysia still needs to continue intensifying its diversification effort away from large scale agricommodity such as oil palm. At present, almost 5.6 million hectares of land is under cultivation for oil palm<sup>5</sup>, with another 1.1 million hectares under cultivation for rubber<sup>6</sup>. Together, these two crops alone make up a similar area to all agrofood crops combined.

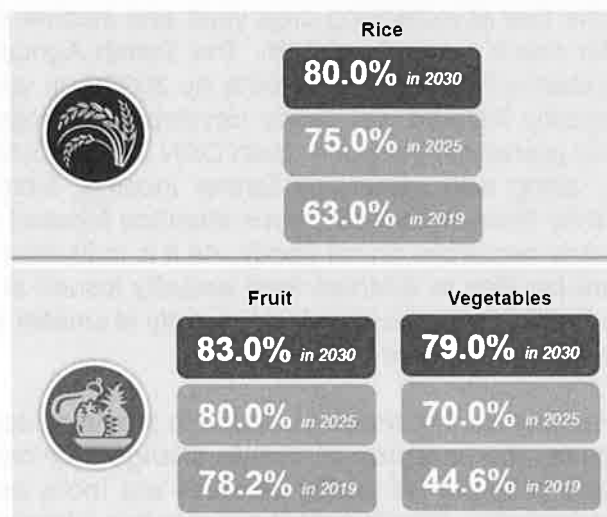


Figure 1: Past and projected Self Sufficiency Levels for rice, fruits and vegetables (National Agrofood Policy 2021 – 2030)

Malaysia's National Agrofood Policy 2021 – 2030 (DAN 2.0) highlights the generally low national Self Sufficiency Level (SSL) for multiple food groups as well as future targets (Figure 1). To reduce reliance on imports, DAN 2.0 has set SSL targets at 80% for rice, 83% for fruits and 79% for vegetables by 2030. The agrofood sector in Malaysia is predominantly comprised of smallholder farmers<sup>7</sup> and remains very labour intensive. There is still a lack of widespread technological adoption in the sector, likely due to availability of cheap labour and limited access to technological applications. There has been a decline in R&D expenditure as a share of agriculture GDP, from 1.88% in 2002 to 0.85% in 2016. Specific examples include only 86.2% of rice producers in granary areas owning low value machinery (less than RM10,000) in 2018. Meanwhile, as of 2018, 72% of livestock farms have limited usage of technology, with only 2% utilising modern technology.<sup>8</sup> The adoption of the voluntary certification Malaysia Good Agricultural Practices Scheme (myGAP), while bringing tangible financial benefits to farmers, is still at very low levels among agriculture smallholders<sup>9</sup>. Youth participation is also very low with only ~15.0% youth employed in the sector in 2015. In addition, only 4.2% of tertiary students considered a career in agriculture in 2016. Reasons

<sup>2</sup> Agriculture, forestry, and fishing, value added (% of GDP) - Malaysia | Data (worldbank.org).

<sup>3</sup> <https://www.dosm.gov.my/portal-main/release-content/economic-census-2023-agriculture>.

<sup>4</sup> National Agrofood Policy 2021-2030 (NAP 2.0).

<sup>5</sup> Oil Palm Planted Area 2023. Malaysian Palm Oil Board.

<sup>6</sup> Data Statistics on Commodities 2022: Rubber. Ministry of Plantation and Commodities.

<sup>7</sup> National pathway for food systems transformation. United Nations – Food Systems Pre-Summit 2021. Ministry of Agriculture and Food Industries, Malaysia.

<sup>8</sup> National Agrofood Policy 2021-2030 (NAP 2.0) Action Plan

<sup>9</sup> Understanding the Landscape of Agrifood Smallholders in Malaysia: Climate Risks, Sustainable Standards, and Gender Gap. – Kuala Lumpur, Malaysia: Khazanah Research Institute

for this low youth participation include agriculture's image as a dirty, difficult and dangerous (3D) industry, lack of technology use and limited returns<sup>10</sup>.

Climate change further exacerbates challenges in the agrofood sector. This is especially true for paddy, as rising sea levels threaten saltwater intrusion into low lying paddy granaries. Furthermore, projections reveal that changes in rainfall pattern and temperature are likely to reduce the average rice yield per hectare by ~10-33% by 2030<sup>11</sup>. As such, reforms in the agrofood sector must consider climate risk and deploy tools and practices that are climate resilient.

### **The hill paddy industry in Sabah**

The current national SSL for rice is just above 56.2% as of 2023<sup>12</sup>. To achieve an SSL of 80% by 2030, DAN 2.0 highlights the role of increasing crop yield and income earned for farmers. At the state level, Sabah's SSL for rice is currently at 22%. The Sabah Agriculture Blueprint 2021-2030 (SAB) lists the target for Sabah's SSL level be at 60% by 2030<sup>13</sup>. In working to achieve this, the Sabah government has recently initiated wet paddy development projects in Kota Marudu<sup>14</sup> and plans to develop a hill paddy granary in Tongod<sup>15</sup>. Both DAN 2.0 and SAB highlight that increasing paddy yield is imperative, along with increasing farmer income, incorporating technology and prioritizing sustainability. While there is correctly much attention focused on wet paddy, there is an opportunity to also focus some resources on hill paddy. As it is cultivated on a much smaller scale, hill paddy cultivation will not be able to address food security issues at a state or national level; however, it does have the potential for addressing food security at smaller scales (rural communities) as well as increase income for rural farmers in Sabah.

Hill paddy has several characteristics that make it suitable in providing opportunities for rural socio-economic advancement against the backdrop of climate change. For instance, hill paddy requires little water for cultivation and heirloom hill paddy varieties are more resistant to diseases when compared to "modern" paddy varieties. Harvested hill rice also has a long shelf life and can be stored for up to 2-4 years.

To fully unlock the potential of hill paddy cultivation, there are several challenges that need to be overcome. A primary challenge is the low yield (Mt/ha) from hill paddy. Currently, yields from hill paddy are around 1-5 Mt/ha, while yields from "modern" variety wet paddy are ~15 Mt/ha (average national yield for wet paddy is ~5MT/ha). Maturing periods for hill paddy also longer (3 - 6 months) compared to wet paddy (~120 days)<sup>16</sup>. Limited research has been done on producing high yield hill paddy seeds, and there is opportunity for agriculture research bodies and academia to fill this gap. The majority of these heirloom hill paddy varieties are not registered with any agricultural body and lack a Geographical Indicator<sup>17</sup>. Recognition of varieties would allow for easier sale of hill rice products, as demonstrated by the popularity of the recognized Bario hill rice variety.

Hill paddy is cultivated using manual methods, mostly in steep terrain. Currently, the low impact nature and small scale of hill paddy farming generally reduces risks of soil erosion and downstream flooding, but if cultivated at larger scales these risks will be more apparent. The adoption of technology is very limited as farmers lack access to such tools. Similarly, irrigation systems are lacking and hill paddy farmers are completely dependent on rainfall. Farmers also rely mostly on the natural fertilizer created after a slash and controlled burn in the planting area. Some farmers may use additional fertilizer, mostly depending on the farmers ability to purchase it or if there is a

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<sup>10</sup>National Agrofood Policy 2021-2030 (NAP 2.0)

<sup>11</sup>Ministry of Energy, Science, Technology, Environment, and Climate Change, Malaysia's Third National Communication and Second Biennial Update Report submitted to the United Nations Framework Convention on Climate Change, 2018.

<sup>12</sup><https://theedgemalaysia.com/node/729581>

<sup>13</sup> Sabah Agriculture Blueprint 2021-2030

<sup>14</sup> <https://www.bernama.com/en/news.php?id=2328706>

<sup>15</sup> <https://www.bernama.com/en/news.php?id=2305266>

<sup>16</sup> The Paddy and Rice Industry of Sabah and Sarawak: Status and Potential. Kuala Lumpur, Malaysia: Khazanah Research Institute

<sup>17</sup> The Paddy and Rice Industry of Sabah and Sarawak: Status and Potential. Kuala Lumpur, Malaysia: Khazanah Research Institute

subsidized allocation. The heavy dependence on natural fertilizer complicates the planting process when rainfall (during previously dry periods) prevents the controlled burning from being executed<sup>18</sup>. The application of pesticides is similar to that of fertilizer, largely depending on subsidies and ability of the farmer to purchase. Though the hill paddy cultivation in place is largely organic and sustainable, very few hill paddy farmers have applied for certification under Malaysia's Good Agriculture Practices Scheme (myGAP) and Malaysia Organic Certification Scheme (myOrganic)<sup>19</sup>. In terms of downstream income-generating activities, farmers lack access to items such as drying ovens and vacuum packaging machines at an affordable cost. These technology tools would allow for farmers to sell high value hill rice product themselves. Farmers also have limited access to wider market and digital marketing skills to promote hill rice.

While the traditional knowledge used in hill paddy farming is rich and extensive, there is still limited documentation of this practice that can be shared within and among communities. With decreasing youth participation in hill paddy planting, there is a risk of such knowledge dying off. One example of such knowledge is how farmers ensure trees (*pokok pelindung*)<sup>20</sup> are in place to limit erosion and create fire bunds around such trees during the controlled burn. Farmers also typically plant multiple varieties of hill paddy at one time, together with other crops like pumpkins and cucumbers<sup>21</sup>. This multi-cropping method assists in pest control and improving soil fertility. With the goal of enhancing hill paddy yield and farming practices, there is a unique opportunity to combine traditional knowledge, nature-based solutions with appropriate technology while ensuring income improvement across age and gender.

### **Increasing income for rural communities and ensuring higher youth participation**

Most hill paddy farming is done for subsistence, although there is demand for hill rice both within Sabah and in other states (especially Selangor and Kuala Lumpur). With an increase in yield, farmers will have a surplus of hill rice that can be sold to increase their income. This also serves as an incentive for youth who are interested in continuing the rich tradition of hill paddy farming with technology, as they can stay in their villages and earn dignified incomes without needing to relocate to urban areas. If this project is able to increase yields, there is further potential for selling hill rice products in Selangor and Kuala Lumpur or further exported to other countries where there is demand for such products.

### **Problem analysis on low hill paddy productivity**

UNDP Malaysia undertook problem analyses of the roots and causes behind the challenges inherent in the hill paddy industry. This was done through desktop research, a rapid field visit, discussions with subject matter experts from ministries and agencies at the federal and state levels, and consultations with the private sector and civil society. On the level of 'Immediate Causes' for the current low productivity of hill paddy we identified: (1) drought and changing rainfall patterns, (2) manual labour and lack of technology applications, (3) low participation of youth, (4) long fallow periods and (5) weeds and pests.

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<sup>18</sup>A. Lasimbang, pers. comm.

<sup>19</sup> The Paddy and Rice Industry of Sabah and Sarawak: Status and Potential. Kuala Lumpur, Malaysia: Khazanah Research Institute

<sup>20</sup>Ulu Senagang Mongool Baru community

<sup>21</sup>C.Lasimbang, pers. comm.

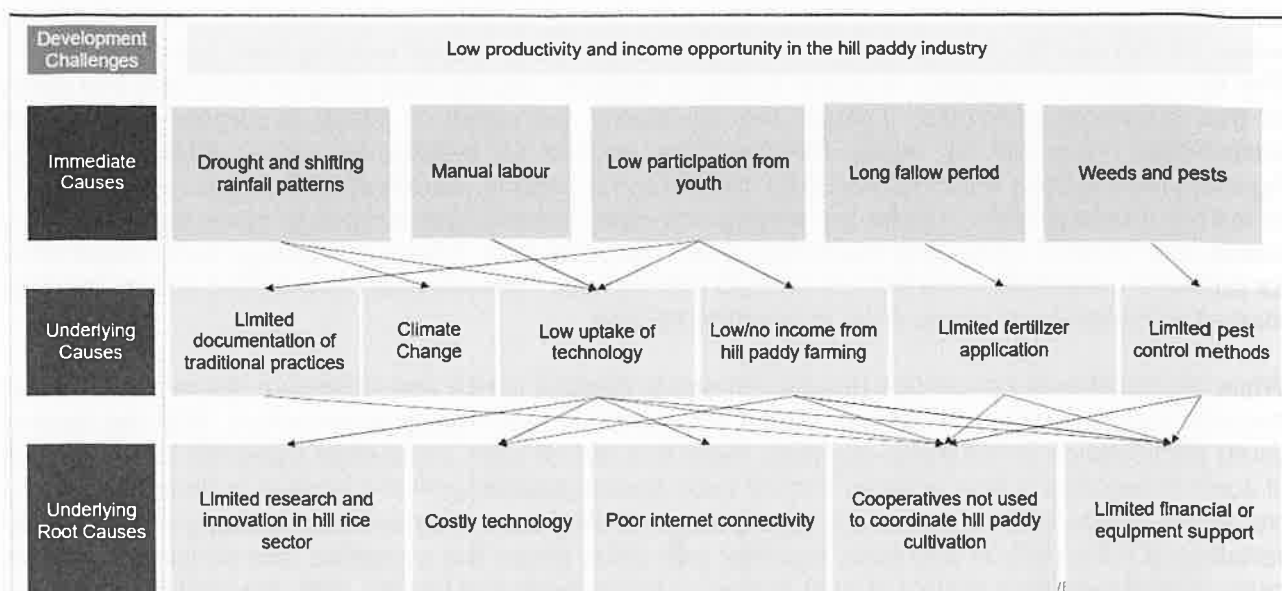


Figure 2: Problem Analysis on the challenge of low productivity and income opportunity in the hill paddy industry.

Figure 2 shows the immediate and two levels of underlying causes preventing higher productivity in the hill paddy industry. With the timeframe of this project, we will not focus on lack of high yield seeds since this will require applied research and development (R&D) that requires a timeline of beyond three years. However, the findings from the outcome of seeds varieties planted in this project can contribute to R&D in the future.

## II. STRATEGY

### Theory of Change



Figure 3: Theory of change detailing two distinct approaches towards enhancing the hill paddy industry

The project will be carried out via two distinct approaches with the goal of enhancing the hill paddy industry and upscaling the work beyond the project sites (Figure 3). For the first approach the project will focus on the demonstration of affordable technology and sustainable farming practices through the community cooperatives in the project sites as well as scoping for additional income generating activities (i.e. agrotourism, packaged hill rice products). The second approach focuses on capacity building for farmers in the use of technology and documentation of traditional knowledge, as well as identifying potential partnerships with the private sector or academia for technology innovation. The second approach further focuses on creating the ecosystem for hill paddy farmers to continue



planting hill rice while sustainably improving productivity. These approaches align well with the Problem Analysis conducted and attempt to fix both the underlying and root causes of the primary development challenge.

The comparatively short time of initial project implementation will require a whole-of-government approach between all stakeholders. Within the limited timeframe of three (3) years (covering 4 planting cycles), the project will focus on a limited number of activities that are more likely to be achievable. The project strategy is to build the foundation for upscaling of operations in the Thirteenth Malaysia Plan (Thirteenth Plan – RMK13) cycle after project period has ended. Finance assurance of such potential up-scaling will be one of the focuses of stakeholders sitting in the Project Steering Committee and UNDP Country Office.

### **Assumptions**

#### **Internal**

- Timely availability of contract finalization and funding for hiring and procurement services.
- Subject matter experts from Malaysia are available to manage and monitor the project effectively.
- Efficient transfer mechanism in place to organize funds from funding source to vendor, as well as verification process of appropriate utilization.

#### **External**

- Political support maintained throughout project implementation especially regarding future scaling up and potential funding sources.
- Government of Malaysia and Sabah government take joint ownership of the project and actively facilitate solutions to issues arising.
- On-ground implementing entities maintain and further develop management capacity and technical knowledge.
- Farmer interest and capacity is sufficient and sustained for at least four planting seasons.
- Technology solutions are accessible, affordable and scalable for community cooperatives and the Sabah government.
- Farmers and the wider community are willing to document their traditional knowledge and share it with UNDP and the Sabah government.
- No severe weather events that disrupt the planned four planting seasons.

### **Project Governance**

UNDP will support the Project Implementing Partner, Ministry of Agriculture, Fishery and Food Industry Sabah (MAFFI) with Project Assurance as well as portions of project management, monitoring and evaluation. Development partners will include Ministry of Economy, Ministry of Agriculture and Food Security, Ministry of Communications, Ministry of Digital, Ministry of Science, Technology and Innovation and Ministry of Tourism, Culture and Environment Sabah. Development partners will sit on the Project Steering Committee and Technical Working Committee. The responsible parties for this project will be Malaysian Industry-Government Group for High Technology (MIGHT), the Department of Agriculture Sabah (DOA Sabah) and Malaysia Digital Economy Corporation (MDEC).

### **Project Coverage**

The project will take place in two (2) sites in Keningau, Sabah. The first site is Ulu Senangang Mongool Baru (USMB; 5°21'18"N 116°01'42"E). USMB is a part of the community use zone within Crocker Range Park, a totally protected area. Sabah Parks, the authority in charge, has worked with the USMB community to draft a management plan and divided the area according to land use (residential, agriculture, etc.). USMB farmers plant hill paddy in lots that are assigned to each family and have an extensive knowledge on managing the land for this crop. The terrain at USMB is steep (more than 25-degree slopes). Current land use guidelines do not allow for agriculture on such

slopes, but there is leeway given to communities cultivating hill paddy as it has been conducted for multiple generations.

The second site is Kg Magatang (Magatang; 5°21'49"N 116°13'15"E), where DOA Sabah has been engaging with community members to develop a hill paddy planting project within parts of the village's grazing area. The grazing area is within a network of farms and community lands that border the Nuluhon Trusmi Forest Reserve. The terrain in Magatang is much less steep (less than 25 degrees). Unlike USMB, very few farmers in Magatang are planting hill paddy actively but the community is keen to cultivate this crop again.

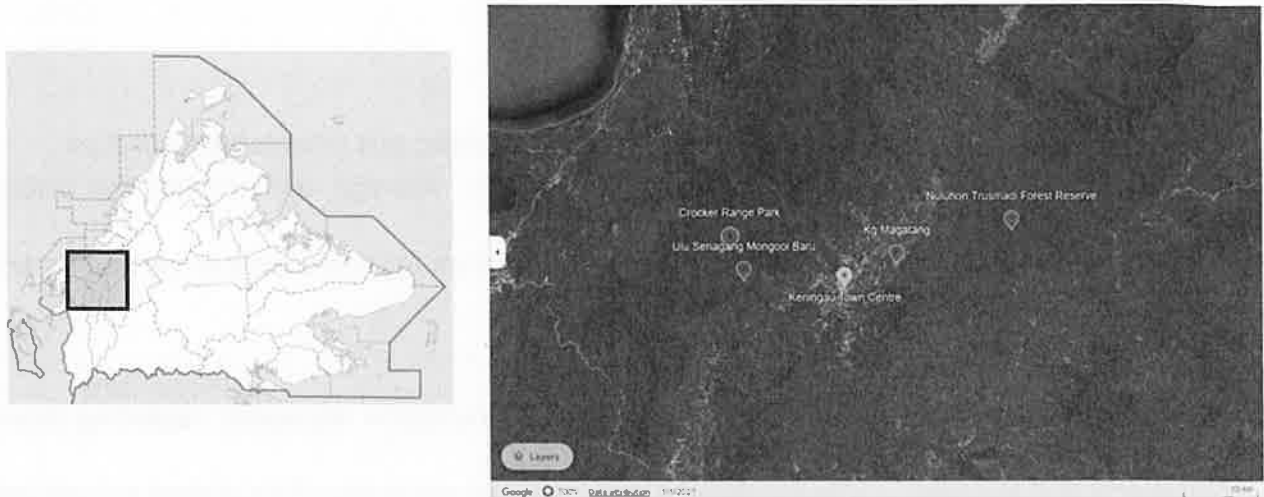


Figure 4: Location of the Project Sites.

#### **Focus on local community farmers**

The project will focus on farmers in the USMB and Magatang cooperatives. Farmer traditional knowledge will be used alongside technical expertise of DOA Sabah and partners. Even if third party contractors are brought in for certain aspects of technology applications, the project will ensure that training is conducted with the involvement of farmers. The project recognizes that hill paddy farming has been traditionally conducted for generations, with many of these practices considered to be sustainable (i.e. shifting agriculture, natural pest control, trees for erosion control). We currently identify one specific practice that may need some modification, which is controlled burning. As we will be intensifying hill paddy cultivation in the same area, continuous controlled burning for natural fertilizer will not be possible. The project aims to identify some solutions to this in full consultation with farmers and rely as much as possible on their traditional knowledge. One possible solution would be the use of systematic fertilization (using technology solutions), natural compost and multi-cropping (using traditional knowledge) to ensure soil fertility in each planting season.

#### **Inclusion of Women and Youth**

The project will work with cooperatives that are already in place at USMB and Magatang. The cooperatives are composed of men, women and youth, ensuring a good representation in terms of gender and age. This will also give an opportunity for youth who have not been involved in the past to consider getting involved in the hill paddy industry (especially if there is a dignified income to be made from it and reduced manual labour). The project places a focus on women hill paddy farmers, that do not receive a sustained income from cultivating this crop and aims to provide avenues for higher income-generation through downstream value creation.

#### **Nature-based solutions and circular economy**

The project will work to find appropriate natural fertilizer (i.e. biochar) where possible to reduce the amount of synthetic fertilizer applied as well as the need for controlled burning. Specific attention will be paid to fertilizer, pellets or any high value-added products that could be created from hill paddy waste (circular waste management). Where possible, pest control using traditional methods

of farmers will also be prioritized to limit pesticide use and explore additional income via waste to wealth activities.

### **Climate resilience**

One aspect of this project is to identify ways in which hill paddy planting can be conducted even through unpredictable weather patterns. In particular, a focus will be placed on irrigation and systematic fertilizer application to reduce the heavy dependence on rainfall and the frequency of controlled burning. Climate data on weather, flood risk and other environment data such as soil health and erosion risk will also be made available to farmers to assist in their planning for the farming activities.

### **Expected Outcomes, Outputs and Activities**

In achieving the overall Objective of enhancing the hill paddy industry, we outline the following outcomes and associated activities. The design of this project is influenced by the extensive knowledge of government agencies and past experiences of UNDP, FAO, UNEP and GEF<sup>22</sup>.

#### **Outcome 1: Increased productivity and livelihood opportunities for hill paddy farmers through integrated sustainable farming practices.**

##### **Output 1.1: Appropriate technology and sustainable farming practices adopted and deployed by farmers by end of the project.**

Activity 1.1.1: Deploy technology solutions (i.e. GIS climate data monitoring system, IOT/AI-sensors and drones for systematic irrigation and fertilisation, renewable energy, composting machines etc.) and innovative solutions at the selected sites, based on the problem statements identified, in addition to the traditional practices (i.e. multi-cropping etc).

##### **Output 1.2: Alternative income-generating activities from hill paddy farming piloted by end of project.**

Activity 1.2.1: Scope and pilot potential hill rice products through downstream processing and packaging.

Activity 1.2.2: Scope and pilot potential hill rice products for digital marketing (i.e. blockchain traceability) and branding exercise for access to wider market.

Activity 1.2.3: Scope and pilot potential agrotourism initiative into current tourism packages in Crocker Range Park.

#### **Outcome 2: Institutional frameworks for sustainable and productive hill paddy industry improved.**

##### **Output 2.1: Capacity building on sustainable farm management with integrated agrotechnology and traditional farming practices to farming communities in the selected sites completed.**

Activity 2.1.1: Conduct on-site training and awareness for Digital AgTech solutions usage and best practices for sustainable agriculture, downstream activities (disaggregated by men, women and youth) and produce training reports.

Activity 2.1.2: Organise engagement sessions with communities to build relevant capacity needed in producing a document on traditional farming practices

##### **Output 2.2: Strategic Action Plan to Enhance the Hill Paddy Industry in Sabah developed.**

Activity 2.2.1: Develop a strategic action plan or blueprint for the hill paddy industry in Sabah by identifying key issues, challenges, and gaps within the industry landscape; conducting benchmarking analysis; and formulating strategic recommendations and actionable plans, including pathways for potential replication in other locations in the states, all aligned with the industry's vision, mission, and targeted outcomes.

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<sup>22</sup> UNDP <https://www.adaptation-undp.org/>

FAO <https://teca.apps.fao.org/teca/>

APAN <https://www.weadapt.org/organisation/apan>

GEF <https://www.thegef.org/projects-operations/database>

UNEP <https://www.unep.org/publications-data>

### **Linkage with United Nations Country Programme Document and Government Plans**

The project is part of the UNSDCF's Results and Resources Framework 2021-2025.<sup>23</sup> It contributes to Strategic Priority Area 2: 'Planet', covering items # 8 and 9 of the Twelfth Malaysia Plan (Twelfth Plan – RMK12) 'Game Changers', and sits within the UN Sustainable Development Goals 2, 5, 8, 15. The UNSDCF Environmental and Sustainability Results Group covers it under its Outcome statement: "By 2025, environmental sustainability and resilience are mainstreamed as priorities within the national development agenda, across all sectors and levels of society."

With the focus on mechanization, this project falls within the scope of one of the Big Bolds (High Growth High Value Agriculture and Agro-based Industry) listed in the Mid-Term Review (MTR) of the Twelfth Plan<sup>24</sup>. This project further aims to fulfill some of the activities outlined in the National Food Security Action Plan 2021-2025 with regards to increasing the use of innovation and technology in food systems (Thrust 1)<sup>25</sup>:

1. Increasing overall mechanization (Strategy 1 Activity 4)
2. Increasing soil fertility (Strategy 2 Activity 1)
3. Recycling usable farm waste (Strategy 3 Activity 2)

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## **III. RESULTS AND PARTNERSHIPS**

### **Expected Results**

**Outcome 1:** DOA Sabah aims to obtain a yield of 3 Mt/ha and two (2) planting cycles a year, through the use of appropriate technology, traditional knowledge and nature-based solutions. Aside from that, information on the amounts and ratios of pesticides (natural and synthetic) and fertilizers (organic and synthetic) to ensure optimum crop health will be obtained through this project.

**Outcome 2:** Capacity building for farmers will take place in the community area based on the selected sites, led by relevant government agencies and private sector partners. If the communities are agreeable and willing to lead, a document on traditional farming practices will be produced. The project will produce a blueprint document for the hill paddy industry and identify the ecosystem gaps for future development. Recommendations on the strategies and action plans to scale the hill paddy industry for state roll out will be crafted through discussions and engagements with multiple partners and beyond.

### **Resources Required to Achieve the Expected Results**

**People:** Community cooperatives from the respective villages will be the main local stakeholder and workforce. Additionally, DOA Sabah, MDEC and MIGHT will be providing technical expertise. As the Implementing Partner (IP), MAFFI will have to assign personnel to monitor and report on the project. UNDP will hire one Project Manager and/or project associate to assist MAFFI with project management, reporting and monitoring.

**Purchases:** Purchases will either be for specific technology and potentially for the services of an agritech company that provides equipment and training. If the Sabah Biodiversity Centre is unable to conduct the training on traditional knowledge documentation, then procurement would also be needed for a company or civil society organization that can facilitate such training.

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<sup>23</sup> UN Sustainable Development Cooperation Framework for Malaysia 2021 to 2025. <https://unsdg.un.org/resources/un-sustainable-development-cooperation-framework-malaysia-2021-2025>

<sup>24</sup> Twelfth Malaysia Plan Mid-term Review. <https://rmke12.ekonomi.gov.my/ksp/bm/dokumen/mid-term-review-twelfth-malaysia-plan-by-chapter>

<sup>25</sup> National Food Security Action Plan 2021 – 2025. <https://www.kpk.gov.my/en/agro-food-policy/pelan-tindakan-dasar-sekuriti-makanan-2021-2025>

**Partnerships:** Partnerships for this project will revolve around MAFFI, the community cooperatives, DOA Sabah, private sectors (i.e. Digital Agtech companies), MDEC and MIGHT with the development partners sitting on the Project Steering Committee (PSC) and Technical Working Committee (TWC).

Sabah's Ministry of Tourism, Culture and Environment through its agency Sabah Parks will oversee activities specific to USMB, as it is within the Crocker Range Park. All farming activities will be assessed, monitored and approved by Sabah Parks to ensure that it does not clash with the existing Crocker Ranger Park management plans.

Key ministries and agencies including the Ministry of Digital, Ministry of Communications, Ministry of Science, Technology and Innovation, Ministry of Agriculture and Food Security, and the Federal Department of Agriculture Malaysia will provide strategic guidance on appropriate technology applications, partnership models, and best practices to support stakeholders in enhancing the capacity of farmers in USMB and Magatang. The Ministry of Economy through its Agriculture and International Cooperation Divisions will monitor the overall implementation and serve as a high-level advisor on the project's direction.

### **Risks and Assumptions (Please refer to Annex for further details)**

#### **Risks**

- If the Implementing Partner has capacity constraints, then the project outcomes would be delayed or partially met or not achieved. This will be mitigated by hiring a UNDP Project Manager and/or Project Associate and placed at MAFFI to assist with personnel constraints and to ensure project implementation.
- If the Free, Prior and Informed Consent (FPIC) process is not done properly, then miscommunications and misunderstanding with the community will occur and lead to community rejection or project abandonment. This will be mitigated by a process of continuous engagement and approach to FPIC, always engaging farmers and keeping them up to date with relevant information. Decisions on project activities will be made with farmers. The Project Management Unit (PMU) and IP will be briefed on sexual exploitation and abuse and a grievance mechanism will be available.
- If there is poor slope management and lack of monitoring on the site, then soil erosion will occur and increase runoff, resulting in environmental degradation on site and downstream. The project will rely on DOA Sabah's expertise for proper slope monitoring and integrate traditional farming knowledge to apply sustainable land practices
- If the use of harmful pest control methods is not controlled, then wildlife deaths (e.g., birds) may occur and breach the Wildlife Conservation Enactment 1997. The project will focus on avoiding culling; implement non-lethal deterrence-based pest control strategies to comply with conservation laws.
- If there is poor collaboration among ministries, agencies, and between federal and state stakeholders, then holistic project implementation will be hindered and lead to unsatisfactory results to the productivity. To mitigate this, the role of the PSC and TWC will promote cross-sectoral coordination, align goals, establish clear roles and communication channels early in the project.
- If there are political changes in priorities for the IP due to state elections, then the project may not receive adequate attention from the IP. To mitigate this, the project will continuously be highlighted in its alignment to the Twelfth Plan, national and state agriculture plans. Alignment with Sabah Maju Jaya and local plans will be done via MAFFI.
- If the resources allocated to this project are insufficient, then certain project activities and outcomes will have to be scaled down. To mitigate this, a multi-year work plan has been developed to plan activities and spending projections. In-kind contributions from MAFFI dan

DOA Sabah will also be available. Other partnerships with private sectors and vertical funding will also be explored.

**Assumptions:** This project inherently requires a whole of government approach as it involves multiple ministries and agencies, deep federal-state cooperation. Beyond that, a whole of society mindset will also be necessary as the private sector, academia and communities will be involved. Another key assumption is that the community cooperatives maintain their support for the project throughout the timeline.

#### **Stakeholder Engagement and Gender Analysis Action Plan (Detailed plans to be produced after LPAC)**

Farmers will be engaged continuously through a Free, Prior and Informed Consent approach. This engagement will occur through respective cooperatives (*koperas*), to ensure transparency and accountability. Specific engagement sessions will be targeted towards farmers who are women and youth. The project will ensure that farmer feedback is highly valued in project decision making.

#### **South-South and Triangular Cooperation (SSC/TrC)**

This will not apply to this project.

#### **Digital Solutions<sup>26</sup>**

A key component of this project (Outcome 2) focuses on technology, which will include digital solutions. The specific technologies will be finalized by the responsible parties and partners, but early discussions have suggested renewable energy, IOT sensors and drones for precision farming that are already in use in Malaysian farms. The use of climate and environment data and relevant applications will be used to assist farmers plan the start of planting seasons. These will require digital upskilling for farmers.

#### **Knowledge**

The knowledge products the projects aim to produce are:

1. Documentation on technology and sustainable practices for enhancing the hill paddy industry, including pathways for upscaling, downstream value creation and partnership models that are beneficial to farmers.
2. Comprehensive documentation of the strategic action plan, including targeted recommendations to address critical gaps and challenges within Sabah's hill paddy industry.
3. The project also plans to build capacity for farmers to document their extensive traditional knowledge. As this knowledge is the intellectual property of these communities, it would be their responsibility to lead the documentation, as only support in terms of facilitating the training with the Sabah Biodiversity Centre or another training provider will be provided.

#### **Sustainability and Scaling Up**

The project will involve scoping and piloting for income-generating activities that farmers can participate in. During the rapid assessment of project sites in August 2024, farmers indicated that there is market demand for hill rice. Ideally, farmers will be able to package and market their hill rice products according to industry standards. For this to happen, there must be a significant increase in yield from planting and farmer capacity in food processing. In terms of upscaling, the project aims to identify more locations to implement the project's activities based on frameworks derived from project learnings.

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<sup>26</sup> Please see the [Guideline "Embedding Digital in Project Design"](#).

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#### **IV. PROJECT MANAGEMENT**

##### **Cost Efficiency and Effectiveness**

The project will be included as part of the overall project portfolio of UNDP Malaysia Country Office (CO). This will ease administrative handling

##### **Project Management**

The project modality will be classified as CO support to National Implementation Modality (NIM). The project will be operationalized in USMB and Magatang. Other engagements with the private sector and government agencies will take place in Kota Kinabalu, Sabah or online. Any engagement involving communities will include representatives from the cooperative and as much as possible take place in village halls for convenience. The PMU is proposed to be attached to the Implementing Partner MAFFI in Kota Kinabalu. For further details on the PMU, please refer to Annex 1.