Roadmap of SUSTAINABLE CACAO DEVELOPMENT in Davao de Oro for 2025-2030, Vision to 2050

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Abbreviations

A&D	Alienable and Disposable
ACPC	Agricultural Credit Policy Council
AEC MPC	Apex Employees and Community Multipurpose Cooperative
AMAD	Agribusiness and Marketing Assistance
ATI	Agricultural Training Institute
BAEW	Barangay Agriculture Extension Workers
BLGU	Barangay Local Government Unit
BPI	Bureau of Plant Industry
BSWM	Bureau of Soils and Water Management
CDD	Cooperative Development Division
CENRO	Community Environment and Natural Resources Office
CFIDP	Coconut Farmers and Industry Development Plan
CLIMBS	CLIMBS Life and General Insurance Cooperative
DA	Department of Agriculture
DAR	Department of Agrarian Reform
DDO	Davao de Oro
DDOSC	Davao de Oro State College
DENR	Department of Environment and Natural Resources
DHSUD	Department of Human Settlements and Urban Development
DILG	Department of the Interior and Local Government
DNAS	Davao National Agricultural School
DOLE	Department of Labor and Employment
DOST	Department of Science and Technology
DPWH	Department of Public Works and Highways
DSWD	Department of Social Welfare and Development
DTI	Department of Trade and Industry
E-NGP	Enhanced National Greening Program
F2C2	Farm and Fisheries Clustering and Consolidation Program
FCAs	Farmers Cooperative and Associations
FMB	Forest Management Bureau
HVCDP	High Value Crops Development Program
ICRAF	World Agroforestry
ICS	Industry Clustering Strategy
IPRD	Information and Public Relations Division
KFI	Kennemer Foods International, Inc.
MAO/MAGRO	Municipal Agriculture Office
MEDA	Mennonite Economic Development Associates

MENRO	Municipal Environment and Natural Resources Office
MINDA	Mindanao Development Authority
MLGU	Municipal Local Government Unit
MonCAST	Monkayo College of Arts, Sciences and Technology
MPDO	Municipal Planning and Development Office
NAFMI	National Agriculture and Fisheries Modernization and Industrialization Plan
NCIP	National Commission on Indigenous Peoples
NGAs	National Government Agencies
NGOs	Non-government Organizations
NGP	National Greening Program
NPAAD	Network of Protected Areas for Agriculture and Agro-Industrial Development
PAFC	Provincial Agricultural and Fishery Council
PAGRO	Provincial Agriculture Office
PCA	Philippine Coconut Authority
PCIC	Philippine Cacao Industry Council
PENRO	Municipal Environment and Natural Resources Office
PENRO	Provincial Environment and Natural Resources Office
PEO	Provincial Engineering Office
PESO	Public Employment Service Office
PhilMech	Philippine Center for Postharvest Development and Mechanization
PICTO	Provincial Information and Communications Technology Office
PLGU	Provincial Local Government Unit
PLU	Production Land Use
PPDO	Provincial Planning and Development Office
PRDP	Philippine Rural Development Project
PSA	Philippine Statistics Authority
RAED	Regional Agricultural Engineering Division
RAFC	Regional Agricultural and Fishery Council
RAPID	Rural Agro-Enterprise Partnership for Inclusive Development
RCPC	Regional Crop Protection Center
RDC	Regional Development Council
RFO	Regional Field Office
RSBSA	Registry System for Basic Sectors in Agriculture
SAFDZ	Strategic Agriculture and Fisheries Development Zone
SFITAL	Sustainable Farming in Tropical Asian Landscapes
TESDA	Technical Education and Skills Development Authority
TWG	Technical Working Group
UP Min	University of the Philippines Mindanao
USeP	University of Southeastern Philippines

1. BACKGROUND

1.1. Rationale of developing the roadmap

- **Cacao is one of priority commodity crops of Davao de Oro province, Davao region, and the Philippines**: as highlighted at least in the Provincial Commodity Enhancement Plan (PCEP) (2021-2023)[1], Industry Clustering Strategy of Davao Region (2020-2030), High Value Crops Development Program (HVCDP), and the National Greening Program (NGP) (until 2028). Department of Agriculture (DA) aims to develop Davao region as a 'cacao capital'.
- **There is a need for a blueprint to guide sustainable development of cacao industry in the province**. The roadmap will compile and synergize all development initiatives on cacao, associated coordination and collaboration across agencies and industry players, and resource allocation and policy support. It will also set targets and indicators of monitoring and evaluation, to help the province achieve sustainable cacao development.
- **Developing a roadmap is part of the realization of the mandate and commitment of the province's authorities**. For example, the Provincial Agriculture Office (PAGRO) has a mandate and commitment for sustainable and climate-resilient agriculture and food security, strengthened partnership among stakeholders, and reduced impacts on the environment. The province's Governor has an order to develop integrated farming practices to help achieve agricultural and environmental sustainability. The Provincial Development and Physical Framework Plan 2019-2034 of Davao de Oro which is formalized through Provincial Development Council Resolution 29, series of 2018 seeks to create economic opportunities for its population while preserving the environment's integrity.
- **The roadmap aims to support the update of existing plans**. In the current Commodity Investment Plan (2021-2023), cacao is among the top five priority commodities of the Davao de Oro province. The roadmap can provide inputs to the updated version of the Plan (2024-2026 or beyond). The Provincial Planning and Development Office is updating the Provincial Development Plan with a possibility to incorporate cacao-related strategies and interventions.

1.2. Definition and significance of sustainable farming and development

- **Sustainable farming practices** reconcile economic profitability, soil and environmental health, and social and economic equity.
- Sustainable farming practices help ensure **sustainable production** which reduces unfavorable impacts on environment while maintaining production level, quality, and

[1] The extension by the local government is in process.

safety standards. Sustainable production also uses natural resources efficiently, minimizes waste, and reduces consumption of unrenewable energy.

- **Sustainable development** helps ensure the present and future generations meet their needs. Sustainable development balances diverse, and often competing, needs with a full awareness of the limitation of and the need to safeguard environmental, social, and economic resources in society.

1.3. Cacao production and potential development in Davao de Oro province

1.3.1. Brief description of the province

- *Geographical and administrative setting*: Davao de Oro (total land area about 466,693 ha) is in the northeast side of the Davao Region, Southern Mindanao. It has 11 municipalities (with a total of 237 barangays) grouped into two legislative districts: District I comprises Compostela, Maragusan, Monkayo, Montevista, and New Bataan; District II comprises Laak, Mabini, Maco, Mawab, Nabunturan, and Pantukan. Nabunturan is the province's capital located 90 km away from Davao City.
- *Demography and ethnic groups*: The province's total population as of 2020 was 767,547 people (47.7% female, 62.9% working age between 15-54 years old, median age 24.4 years old). Mansaka is its main ethnic group, with migrants mostly from Cebu, Samar, Bohol, and other provinces in the Visayas region.
- *Land covers, forest protection, and watersheds*: The province has 153,097 ha (32.8%) of Alienable and Disposable (A&D) lands and 313,296 ha (67.2%) of forest lands. Compostela and Mawab municipalities have the smallest areas of forest lands (Appendix 1). The 388,166 ha of the province's Production Land Use (PLU) consists of croplands (50%), production forests (49%), and fishing and pasture areas (1%)[2]. Protected areas are in Mabini, Nabunturan, Maco, Maragusan, Pantukan, Monkayo and Compostela municipalities[3]. The province also hosts four Key Biodiversity Areas (KBAs) namely, in Monkayo, Mabini, Compostela, and Maragusan[4]. Additional protection areas based on slope and elevation overlap with these KBAs. There are four watersheds: Upper Agusan, Andap, Hijo, and Kingking-Matiao. Upper Agusan is the largest in terms of area (118,780 ha). There are other declared watershed areas under co-management agreements between the Department of Environment and Natural Resources (DENR), the Upland Development Program, and the concerned

[2] The province, through the Regional Development Council (RDC), plans to decrease the total production area into 345,334 ha (42,832 ha decrease) to reallocate into protection forest. On the other hand, production forest is targeted to increase from 192,799 ha to 197,367 ha (4,568 ha increase), and around 55% of it for agroforestry, and the rest for rehabilitation area through the establishment of forest plantation.

[3] Mabini Protected Landscape and Seascape in Mabini, the Mainit Hot Springs Protected Landscape in Nabunturan, Mt. Tagub-Kampili Protected Landscape inn Pantukan and Maragusan, proposed Bahi Mineral Reservation in Pantukan, Lake Leonard Buffer Zone in Maco, Andap Watershed in New Bataan, Diwalwal Mineral Reservation in Monkayo and Compostela, and the Aliwagwag Protected Landscape in Compostela. Davao Region currently has 56,800 ha of protected forest areas and additional 44,456 ha has been proposed as additional protection areas (namely, areas with elevation of more than 1000 masl and slope steeper than 50% that are currently partly utilized for other land uses, mostly croplands).

[4] Bislig in Monkayo, Mabini Protected Landscape in Mabini, Mts. Atuuganon and Pasian in Compostela, and Mt. Kampalili-Puting Bato in Maragusan.

provincial and municipal governments. The land covers of Davao de Oro in 2021 and protected areas are illustrated in Appendix 2.

- *Main crops and production*: As of 2023, in terms of harvested area, the five main crops of the province are corn (37,731 ha), coconut (36,996 ha), banana (33,198 ha), paddy rice (31,641 ha), and cacao (6,462 ha). In terms of the market value, the key commodities are paddy rice (~PHP 2.7 billion), corn (~PHP 998 million), abaca (~PHP 901 million), coconut (~PHP 883 million), while cacao is currently the seventh (~PHP 163 million).

1.3.2. Current contribution of cacao to the province's agriculture sector

- *Production areas and productivity*: Based on the enhanced land cover map from the SFITAL project[5], the municipalities with the largest area of cacao cultivation in 2021 were New Bataan and Pantukan, with ~1,805 ha in total for the two municipalities. In 2021, a total of 4.95 million cacao hills were planted in the province[6], and around half were bearing fruits. Two municipalities with the most bearing cacao shrubs were New Bataan and Nabunturan (Appendix 3). In terms of productivity, the highest was in Mabini (2.4 kg/tree or 0.67 ton/ha), and the lowest is in Laak (0.2 kg/tree or 0.02ton/ha). Difference in productivity level relates to, for example, management practice, tree age, soil and local weather condition, and planting densities. Most cacao cultivation in the province accommodate banana, coconut, fruit trees (rambutan, durian, lanzones, mango, etc.), and rubber.
- *Income share to agricultural sector*: No information is available regarding income generated by the whole cacao industry in the province[7].

1.3.3. Existing plans of cacao development in the country

At least there are four:

- The Philippine Cacao Industry Roadmap 2021-2025 created in 2022 by the Philippine Cacao Industry Council in collaboration with the Department of Agriculture (DA) and Department of Trade and Industry (DTI)
- Davao Region Industry Cluster Roadmap Updated Action Plans, 2020-2030 enacted in 2019 by the Regional Development Council XI
- Provincial Commodity Investment Plan 2021-2023 enacted in 2021 by the Provincial Government of Davao de Oro, developed for the Philippine Rural Development Program

[5] Sustainable Farming in Tropical Asian Landscapes (SFITAL), a 5-year project funded by the International Fund for Agricultural Development (IFAD) and led by the World Agroforestry (ICRAF) with project sites in Indonesia and the Philippines. It is the project which supports the development of this roadmap of sustainable cacao development for Davao de Oro.
[6] Source: Local Government of Davao de Oro (2021). Management Information System, cited by Provincial Agriculture Office. (2022). Cacao Industry Situationer [PowerPoint presentation].
[7] The available information from the Philippine Statistics Authority is only for dry cacao beans: in 2022, the income generated from the production of dry cacao beans in Davao de Oro province amounted to PHP 6.14 million, constituting only 0.022% of the total earnings from the crop sector in Davao de Oro.

- Three-Year Strategic Plan for 2022-2024 crafted in 2022 by the Provincial Cacao Council

1.3.4. Potential of cacao in the province

- The province, through the Regional Development Council[3] (RDC), planned to decrease the designated production areas by 42,832 ha to reallocate some of its total production area to protection forest. On the other hand, Davao de Oro will increase their areas designated for production forest[4] from 192,799 ha to 197,367 ha. Around 55% of the increase will be used for agroforestry.
- Cacao in Davao de Oro is integrated with banana, coconut, fruit trees (rambutan, durian, lanzones, mango, etc.), and rubber. These commodities expand the potential of cacao for integration in agroforestry systems.
- Davao de Oro has around 46,000 ha of lands designated as agroforestry zone and around 133,000 ha as agro-industrial croplands under the Strategic Agriculture and Fisheries Development Zone and Network of Protected Areas for Agriculture and Agro-Industrial Development land use plans from the Bureau of Soils and Water Management of the DA, respectively.
- Cacao is included among the priority commodities under the Industry Clustering Strategy (ICS) of Davao Region, together with other cacao agroforestry species like abaca, banana, coconut, durian, rubber, etc. (RDC XI, 2019). It is also included among the priority commodities of the NGP apart from other high value crops integrated in cacao agroforestry such as coffee, and rubber, abaca, etc. [5](DENR, 2017).
- The 2021-2040 Coconut Roadmap (PCA, 2022) targets to intercrop perennial crops including cacao and related cacao agroforestry species (coffee and fruit trees) in 50,000 ha of existing coconut areas[8]. The National Agriculture and Fisheries Modernization and Industrialization Plan 2021-2030 (DA, 2022) listed cacao, banana, cacao, coffee, and palm as among the commodities linked to coconut-based agriculture in Davao Region[7]. The municipalities having the largest coconut plantations are New Bataan (10,000 ha), Monkayo (138,000 ha), Laak which has the biggest area (249,000 ha) (SFITAL, 2022).
- The Banana Industry Roadmap (DA, 2021) targets an increase in areas devoted to cavendish by 1% per year, *saba* by at least 3% per year, and *lakatan* by 1% per year. One of its strategies is using *saba* as an intercrop to coconut (maincrop), or as shade plant to newly established orchards. *Cavendish* and *lakatan* are planted in monocrop systems to intensify planting. The Abaca Industry Roadmap (PhilFIDA, 2021) targets to expand or rehabilitate 67,1000 ha from 2021 to 2025. To do this, intercropping with suitable crops, including coconut and cacao areas is a strategy.
- In 2013, there are 1,173 ha planted with rubber in Davao de Oro based on PSA data (RDC XI, 2014). The Rubber Industry Roadmap (DTI, 2017) aims to increase total rubber production in the country to 1.2 MT/ha and expand its production areas. Under the NGP Expansion Program (Executive Order 193), the Forest Management Bureau of the DENR was tasked to identify areas per region for rubber expansion for the period 2017-2028 (DTI, 2017). In 2016-2018, the Ecosystems Research and Development Bureau of the DENR has also performed site matching of rubber, coffee, and cacao[8].

[8] Target areas have not been disaggregated by province or municipalities based on the Industry Cluster Roadmap (RDC XI, 2019).

- Based on recent information from the Municipal Government of Nabunturan (Municipal Agriculture Office of Nabunturan, 2021), there is a total of 4.95 million cacao hills planted in Davao de Oro, and around half of it are bearing. New Bataan has the greatest number of bearing trees with 568,950 hills, followed by Nabunturan having 395,500 hills. However, these municipalities have relatively low productivity. In terms of productivity, Mabini has the highest productivity of 2.39 kg/tree and 667.31 kg/ha. Productivity level may be affected by management practices, tree age, location, and planting system, among others.

1.3.5. Main issues of cacao production and development in the province

Several issues in relation to cacao development are presented below. These were derived from official government plans, as well as from the results of the stakeholder interviews and planning workshops organized by the Sustainable Farming in Tropical Asian Landscapes Project.

A. Issues related to farm location

- **There are no clear designated zones for cacao production**. Although at the national level, the Philippine Rural Development Project has helped identify the top-ranking municipalities with high potential for cacao production[9], the province has no clear designated zones for cacao production. This hampers efficient allocation of support and resources for cacao and limits the achievement of economies of scale.
- **Scattered cacao farms in some municipalities complicates consolidation**. Cacao production hotspots[10] in the province are primarily in New Bataan, Maragusan, and Nabunturan, and, to some extent, in Pantukan, Mabini, Maco, and Mawab. In some municipalities like Laak, Monkayo, Montevista, and Compostela, cacao farms are relatively scattered with 40-47 km distance among the farms.
- **Proximity to chemical-intensive farms of other crops** such as banana, rice, and corn might prevent cacao farms from getting a certification of product quality standard such as PhilGAP.

B. Issues related to management practices and productivity

- **Poor management practices have led to low productivity**. Factors such as clonal incompatibility, low quality planting materials, excessive shading in the farm, increased pest and disease risk, lack of rejuvenation practices, and low pollinator populations, exacerbated by unpredictable and extreme weather conditions, have contributed to low cacao farm productivity and overall cacao production in the province. Limited access to high-quality planting materials also influences farmers to depend on the varieties of planting stocks that are readily available.

[9] The potential areas were determined based on several weighted vulnerability and suitability criteria: volume of production (15%), number of farmers (10%), total production area (20%), and poverty incidence (5%). The order from highest to the lowest potential are: Compostela, Laak, Montevista, Maragusam, Mawab, Nabunturan, Maco, Pantukan, Monkayo, Mabini, and New Bataan.
[10] Hotspots are cacao areas that tend to cluster within 1x1 km grids.

- **Inadequate soil and water conservation practices.** Many cacao farms in Davao de Oro are situated on steep slopes (more than 30% slope) that are susceptible to soil and nutrient losses and unregulated water supply. Farmers lack the necessary techniques for soil and water conservation to mitigate losses and address drought conditions effectively.
- **High input cost.** Farmers are being demotivated to consistently apply inputs due to the low productivity and high costs of commercial fertilizers and pesticides, which is further aggravated by the low price of beans. Moreover, limited knowledge and labor resources impedes their ability to utilize less-costly farm inputs such as natural fertilizers and pesticides.
- **Emission from farm inputs.** With the current rate of input use by the cacao farmers, the estimated greenhouse gas (GHG) emission is 0.16 $tCO2_e$[11] per ha of cacao farm or about 1,005 tCO2e for the whole province from a total of 6,372 ha of cacao farms.

C. Issues related to human resources

- **Low interest of young farmers** to engage in cacao production business
- **Insufficient knowledge of agroecological practices**. Cacao farmers in the province have generally limited knowledge and technical skills in implementing agroecological practices, namely farming practices which aim to make cacao farms more environment-friendly and climate resilient[12].
- **Absence of farm record-keeping** reduces the ability of cacao farmers to apply for certification of Good Agricultural Practices. In addition, lack of entrepreneurial skills restricts their decisions regarding what to sell, where to sell, and how to sell.

D. Issues related to market and value chains

- **Absence of centralized market information** poses challenges for both farmers and buyers in optimizing their activities[13].
- **Poor access to fermentation facilities** prevents farmers from consistently producing high quality fermented dry beans.
- **Limited value addition of cacao products from smallholder farmers**. Income of many cacao farmers is mainly from selling wet or dry beans.
- **Challenges in complying with quality standards**. The capacity of farmers, traders, and processors needs to be enhanced to comply with quality standards and cacao production and processing protocols.

E. Inadequate farm-to-market roads

[11] Based on the estimation by the World Agroforestry (ICRAF). Farmers in Davao de Oro commonly use ~52 kg/ha of ammonium phosphate (18-46-0), ~142 kg/ha of complete fertilizer (14-14-14), ~53 kg/ha of muriate of potash (0-0-60), ~94 kg/ha of sodium chloride, and ~4.5 L/ha of herbicide. GHG emission contributes to climate change which negatively affects agriculture through the alteration of weather patterns and pest and disease dynamics. The demand for inputs like fungicides and pesticides will increase alongside the intensification of extreme climate conditions. Reducing GHG emissions by minimizing chemical usage serves as both a mitigation and adaptation strategy to counteract climate change.

[12] Examples of agroecological practices are integrated pest and disease management, appropriate nutrient application, effective shade management, crop diversification (spatially and temporally), and soil and water conservation practices.

[13] For instance, buyers lack information about the availability and sourcing locations of beans. Some institutional buyers are discouraged from visiting villages due to unpredictable supply availability upon arrival. Similarly, farmers are uncertain of the buyers' visit schedules to their villages, leading them to sell to whoever approaches, often at varying prices.

- Inadequate farm-to-market roads limit farmers' access to markets and sources of essential inputs like seeds and tools.
- This poor connectivity also restricts buyers' ability to visit farms, leading to fewer purchasing options for farmers.
- As a result, farmers often have to rely on a small number of buyers, which weakens their bargaining power and can lead to less favorable prices for their cacao beans.

F. Issues related to policy and institutions

E.1 Financial institutions

- **Absence of institutions that can assist farmers in accessing capital investments** to enhance their production and post-harvest practices
- **Poor access to insurance services**. Farms affected by climate threats such as drought and infestations are often not covered by insurance services, leaving them vulnerable to production risks.
- **Obligation for payback installment**. Farmers surely need to return loans to input suppliers even when they failed to make profits.

E.2 Agricultural extension services

- **Lack of close mentorship programs** for farmers apart from the formal training offered by the local government and private organizations. After trainings sessions, there is no follow up and continuous program that can help address current challenges faced by farmers.
- **Farmers lack knowledge and technical support to adhere to Good Agricultural Practices** such as information on compliance requirements, certification benefits, traceability, and assistance with the application process.

E.3 Cooperatives and farmer associations

- **Lack of farmer clustering** leads to farmer needing to manage their own post-harvest process[14]. Even though other farmers adhere to recommended post-harvest processes, their beans are still bought at similarly low prices. The buyers consolidate the beans, regardless of whether they are properly fermented or not.
- **Lack of coordination among farmers** prevents them from jointly investing in a communal processing facility. Furthermore, buyers hesitate to visit villages due to unreliable supply and given the poor farm-to-market roads.

E.4 Research institutions

- **Limited research publications** on techniques for enhancing and resilience to pests and diseases that are adaptive to effects of climate change
- **Lack of collaboration and coordination** among research institutions, public and private sector, and farmer's cooperatives

[14] With relatively small landholdings, farmers often neglect the recommended post-harvest processing steps to ensure high bean quality (e.g., bean extraction, fermentation, drying, sorting, and bagging). They store and accumulate the extracted beans in bags before selling the beans to traders with no have regular schedule of purchasing from farmers. As a result, the beans are often sold at lower prices.

E.5. Lack of local policy support (e.g., regulations, incentives, etc.) in cacao sector to enable sustainability

2. SCOPE AND APPROACH OF DEVELOPING THE ROADMAP

2.1. Sectoral and temporal scope

- All relevant stakeholders in the province, including private sector and multi-sectoral government institutions (e.g., forestry, agriculture, infrastructure, etc.), farmers' associations and cooperatives, and non-government research and development organizations, among others, are involved in developing this roadmap.
- This roadmap will outline the strategies and interventions for cacao development in the Province of Davao de Oro for 2025-2030, with a vision to 2050.

2.2. Principles and conceptual framework

- The roadmap is guided by three main principles: inclusive, integrative, and informed. The roadmap is ***inclusive*** because it involves and accommodate inputs from all relevant stakeholders in the provinces; ***integrative*** because it considers various existing plans including spatial plans and sectoral plans to avoid siloed processes; and ***informed*** because the roadmap uses reliable sources of data, and all relevant stakeholders are well informed throughout the development and completion process.
- The roadmap development applies a **landscape approach**: cacao production areas and industry in the province need to consider other land uses e.g., production of other main crops, forest cover and connectivity to help ensure the maintenance of ecosystem services and biodiversity, and protection areas for safeguarding natural resources.

2.3. Methodological framework and assessment tool

- The development of the roadmap is carried out in four stages:
  1. ***Participatory data collection*** about cacao farmers and production in the province, key issues, available information to include spatial information for landscape assessment, and policy regulations and support
  2. ***Participatory planning and assessment*** to identify vision and set objectives, strategies and interventions for development, and project impacts of the strategies and interventions
  3. ***Prioritization and financing*** of the strategies and interventions based on urgency and capacity for implementation and associated timeline, estimation of investment costs, and exploration of possible sources of financing

4. ***Launching and implementation*** or integration into current policy framework of the province, launching to alert broaden audience and to start implementation

- The four stages are implemented through preparation phase and **four planning workshops** with all relevant local stakeholders in the province (Appendix 4).

3. VISION, STRATEGIES, AND INTERVENTIONS

3.1. Vision

- The Philippine Cacao Industry Roadmap 2021-2025 has this vision: "A globally competitive and sustainable Philippine Cacao and Chocolate Industry built on a strong Philippine Brand of quality cacao."
- The vision for agricultural sector of Davao de Oro province as stated in the Commodity Investment Plan is: "A dynamic organization committed to achieve maximum production and sustainable agriculture for Davao de Oro Province through appropriate farming technologies supported by leaders anchored on the principle of environment friendly and rational utilization of resources."
- Based on the perspectives of local stakeholders in the planning workshops for roadmap development, the **proposed vision of cacao industry in the Davao de Oro province** is this:

"A globally competitive cacao industry built on landscape sustainability, empowered cacao growers and entrepreneurs, profitable business ventures, and transparent and inclusive governance."

3.2. Objectives

General Objective

- The Philippine Cacao Industry Roadmap 2021-2025 has this general objective "to harmonize the production and postharvest practices of cacao growers and to establish Philippine brand in the global market"
- The main objective of the Province's Commodity Investment Plan is "to ensure sustainable and vibrant local economy" and "to promote investment marketability" as sectoral objective.
- In line with the vision, the general objective of this roadmap is "to transform the province's cacao industry into a global competitive sector, built within sustainable landscape, and supported by empowered cacao growers and entrepreneurs, profitable business ventures, and transparent and inclusive governance."

Specific Objectives

- The Philippine Cacao Industry Roadmap 2021-2025 has these specific objectives (1) ensure availability and accessibility of quality cacao planting materials, (2) rehabilitate existing aging trees, (3) Increase production areas, (4) Raise crop yield to 2 kg/tree/year, (5) ensure availability of high-quality fermented cocoa beans to support and sustain value-adding activities, and (6) contribute to the goal of attaining inclusive growth and poverty alleviation.

- The specific objectives of the Province's Commodity Investment Plan are (1) improve market accessibility, (2) improve agricultural productivity and value chain, and (3) provide opportunities for private sector investments in agro-industrial production.
- This roadmap has five specific objectives namely:
  (1) All cacao farms in the province apply clonal diversification by 2028 and all cacao farmers, both male and female farmers, are capacitated on appropriate ways to introduce and maintain diverse clones within their farms and associated agroecological practices, which lead to improved cacao productivity with reduced greenhouse gas emission from agricultural practices.
  (2) To increase production of quality fermented cacao beans by at least 20% by the end of 2030 with improved access to cacao consolidation points and market value chain for an economy of scale, and strengthened collaboration between public and private sectors including for increased investment towards more advanced and sustainable fermentation technologies.
  (3) To increase contribution of cacao commodity and business to income of cacao growing households by at least 10% and to total income of province's agricultural sector by at least 5% by the end of 2030, which will further contribute to poverty reduction and maintaining food security.
  (4) Forest cover is maintained by at least 30% of province's total land area for the purpose of safeguarding natural resources and biodiversity conservation which will help sustain the level of crop productivity in the province, and no more expansion of cacao or any other commodity to forest lands.
  (5) To enhance the capacity of local government units in providing institutional and regulation support, and reinforce the roles of the Provincial Cacao Council, research and development sectors, academic institutions, and private agencies in delivering technical assistance, capacity development, research, extension services, and resources to cacao stakeholders.

3.3. Strategies

- The Philippine Cacao Industry Roadmap 2021-2025 identifies six development directions which are needed to be considered in the implementation of the roadmap namely, (1) **Expansion of production areas** in areas suitable for cacao growing based on the climate and soil suitability map, (2) Increase in **fermented bean productivity level**, (3) Moving up of the cacao **industry value chain**, (4) Strengthening of **market presence through branding**, (5) Focus on **fine flavor beans market**, and (6) Application of the principle of **clustering, localization and market demands**.
- The main strategy to achieve prosperity or economic development of all sectors as outlined in the Provincial Commodity Investment Plan is to ensure sustainable and vibrant local economy through (1) Improving **market accessibility**, (2) Improving **agricultural productivity** such that improving farms and rural enterprises, (3)

Providing opportunities for **private sector investment** in agri-industrial production, and (4) Improving the **value chain**.

- The proposed strategies for the current roadmap aim to ensure that the rural landscape of Davao de Oro can generate economic benefits from cacao and other commodity crops, while maintaining ecosystem services to include biodiversity and safeguarding natural resources to include forest areas. The strategies also aim to address multiple issues related to the cacao industry in the province described earlier. Based on the strategies outlined in the existing plans and input from local stakeholders gathered through the planning workshops, there are **six proposed strategies**:

(1) Sustainable land use allocation for cacao production

This strategy is to ensure that the selection of cacao production areas in the province considers land suitability and risk to climate threats and synergizes with other land uses related to other commodity crops and forest protection, as outlined in the existing development plans for Davao De Oro. This strategy also emphasizes the need to rejuvenate old and unproductive cacao farms through co-investment schemes involving the private and public sector. Also included in this strategy is the evaluation of economic and ecological impacts of current and future land uses in the province, of which initial related data and findings are presented in Appendix 5.

(2) Improving the access of the cacao farming community to livelihood capitals

This strategy will increase the capacity of the cacao farming community in cacao production and post-production. It can be achieved through improving facilitation of cacao farmers to receive effective extension service and access to information regarding cacao production and post-production with increasing participation of women and youth (*human capital*), access to knowledge, market relationships, community network, (*social capital*), access to farm inputs to include quality planting materials, processing facilities and farm-to-market roads and other infrastructure (*physical capital*), natural resources to include pest control, soil fertility, and water availability (*natural capital*), and co-investment or financing support such as loans, grants, and crop insurance to establish and maintain cacao farms and production facilities (*financial capital*).

(3) Increasing the productivity and income diversification of cacao farms

This strategy aims to help ensure that cacao farmers are not severely affected by increasing production costs due to e.g. lack of supply or inflation, market uncertainty (e.g., fluctuating cacao prices influenced by global supply and demand), and uncertainty in climate condition exacerbated by climate change. To achieve such resilience, it is important to promote cacao agroforestry and agroecological practices for more environment-friendly and climate resilient cacao farms. This

strategy also emphasizes the need of increasing the awareness, interest, and capacity of the cacao farming community to adopt 'safe' agricultural practices or to meet product quality standards such as PhilGAP.

(4) Sustainable improvement of supply and market value chain

This includes the need to improve governance, connectivity, fairness, and transparency of supply and market value chain. As part of building transparency, the cacao sector of the province should gradually be transformed into a more digitalized sector. In addition, increasing interest in the Cacao farming community to produce quality cacao beans is also part of sustainable developing supply and market value chain. Increasing such interest will need providing incentives such as higher market prices or better access to the current market. The provision of adequate farm-to-market roads will help increase connectivity across the value chain by improving market access and mobility.

(5) Incentivizing ecosystem services generated at farm- and landscape scale

Ecosystem services include water provision, carbon storage, and biodiversity. Incentives for such services, either from public or private sector, will encourage farmers and local communities to protect the environment through better management of crops, livestock, forests, and conservation of endangered flora or fauna species and their habitats.

(6) Strengthening institutions and local policy environment

The sixth strategy establishes a supportive framework for the effective implementation of Strategies 1-5. This involves enhancing the capacity of local government units to provide institutional support (such as the creation of committees including the Provincial Cacao Council, promotion of cacao brand of the province), regulation (including adoption of guidelines or protocols, and creation of incentives), infrastructure (like gene banks and post-harvest facilities), education and e, tax/fee exemptions, and subsidies), marketing (focusing on research, knowledge dissemination, and promotion), technical support (such as planting materials and crop insurance), and recognition (through awards). Additionally, it reinforces the roles of the Provincial Cacao Council, local government units, research and development sectors, academic institutions, and private agencies in delivering technical assistance, training, research, extension services, and resources to cacao stakeholders.

It is worth to underline that, effective implementation of all these strategies and associated interventions (Section 3.3 below) will require close **coordination and negotiation among relevant sectors and stakeholders in the province to include the Cacao Industry Council** and strong **policy support**.

3.4. Interventions

The proposed interventions below have integrated those outlined in the Philippine Cacao Industry Roadmap, Davao Region Industry Cluster Roadmap, Provincial Commodity Investment Plan, and inputs from the SFITAL's planning workshops. In addition, the interventions address multiple issues regarding cacao production and development in the province described earlier in Section 1.

Strategy 1: Sustainable land use allocation for cacao production

There are three interventions:

1.1. Designate main **cacao production areas** and identify possible **areas for expansion, rehabilitation, and rejuvenation** of cacao farms. The proposed areas should consider land suitability and risk to climate threats, cacao consolidation points, and synergize with land use plans of other commodity crops and forest uses, either for production or protection.
1.2. Develop **recommended models of cacao farms and suitable crop components** to reconcile economic and ecological benefits that can be derived from the farms.
1.3. Assess **economic and ecological impacts of several land use scenarios** at municipality or province scale and conduct trade-off analysis to help understand associated risk and benefits for decision making[15].

Strategy 2: Improving the access of the cacao farming community to livelihood capitals

There are seven interventions:

2.1. Assist cacao farming community to better access **crop insurance**.
2.2. Improve **access to farm inputs** to include quality planting materials (multiple cacao varieties, grafted seedlings, etc.), farm tools, by e.g. strengthening collaboration with national government agencies, academe, non-government organizations, private enterprises, and farmer organization.
2.3. Equip farmer organizations to engage in fermentation, drying, and other postharvest operations in cacao production.
2.4. Strengthen collaboration with national government agencies, academe, the private sector, Cacao Industry Councils, and cooperatives, to establish more **consolidation points** in strategic locations to **improve market access.**
2.5. Improve the knowledge and technical capacity of cacao farming community in **bean quality.**

[15] An option of supporting tools for making such projection and trade-off analysis is R-FALLOW (Forest Agroforest Low Value, Landscape or Wasteland?) developed by the World Agroforestry (ICRAF). The model can handle input maps and available online: https://rfallow.agroforestri.id/. The user's manual of the model is available at https://cacaomustahan.com/r-fallow-users-manual/. A training on the concept and how to operate the tool was given to local stakeholders in Davao de Oro province in October 2023.

2.6. Improve **entrepreneurial skills** of cacao farming community including women and youth to increase their ability in finding new market opportunities, including product development.
2.7. Improve and establish **farm-to-market roads**

Strategy 3: Increasing productivity and income diversification of cacao farms

There are two interventions:
3.1. **Promote sustainable cacao farming practices** through extension services, integration of cacao into education curriculum and training manuals, establishment of demonstration farms.
3.2. **Improve extension service and mentorship program** for cacao farming community, including women and youth, regarding e.g. cacao production and post-production, market opportunities, training programs, and climate information

Strategy 4: Sustainable improvement of supply and market value chain

There are two interventions:
4.1. Improve the **governance, connectivity, fairness, and transparency** of supply and market value chain by strengthening collaboration between public and private sector to include Cacao Industry Council.
4.2. Provide **market incentives** such as higher market price or better access to current market for 'safe' or premium higher quality cacao beans.

Strategy 5: Incentivizing ecosystem services generated at farm- and landscape scale

There are three interventions:

5.1. **Reward mechanisms** for farmers adopting cacao agroforestry and agroecological practices which contribute to generating ecosystem services such as carbon storage and biodiversity at farm or larger scale.
5.2. Strengthen collaboration with research institutions for quantifying water regulation, carbon sequestration, and pest control through more sustainable cacao farming practices.
5.3. Identify opportunities for e.g. carbon or biodiversity credit both from potential investors within and outside the county.

Strategy 6: Strengthening institutions and local policy environment

There are three interventions:

6.1. Formalization of cacao governing institutions in support of the local government unit
6.2. Crafting **supportive policies** for the strategies and interventions in the cacao roadmap
6.3. Adoption of farm consolidation and clustering approach in cacao development.

4. IMPLEMENTATION AND INVESTMENT PLAN

4.1 Definition of roles of agencies

Lead agency

The lead agency is the primary organization that ensures the execution of the specific activity according to the timeline targets. It communicates with partner agencies to align efforts and resources effectively. It is also responsible for tracking the performance and making necessary adoption to current context. It is the one who reports the status of the activity in the monitoring and evaluation platform. As described later in Appendix 6, the PAGRO is the lead agency of most of the roadmap activities.

Partner agency

The partner agency supports implementation of the activity by providing resources, expertise, or manpower. It carries out the tasks assigned by the Lead Agency.

Funding agency

The funding agency provides financial or in-kind support to carry out the specific activity. It ensures that the funds are used according to agreed-upon targets.

4.2 Activities, targets, and time plan

Each intervention has several activities and associated targets with implementation plan across the next five years (2025-2030) (Appendix 7). The time plan also reflects the level of priority of the intervention and activities. For example, the activities to implement in 2025 are considered as 'more prioritized' and can provide foundation for activities to implement in later years. Two factors namely, 'urgency' and 'readiness to implement' determine the level of priority. Urgency refers to potential impacts especially on local communities if the activities are or are not implemented soon. Readiness to implement refers to the capacity of local stakeholders and the availability of other resources in the province to implement the activities. Some activities can increase the readiness of the province to implement other activities, and therefore, they help create the 'foundation' to implement the other activities. Appendix 6 also informs lead and partner agencies for implementing the activities.

4.3 Investment plan and potential funding sources

The total estimated budget for implementing the roadmap in the next five years (2025–2030) is about 84 million PHP. The annual budget ranges from 10 to 18 million PHP (Figure 1). The

estimated budget for each activity, cost category, and potential funding sources are listed in Appendix 6.

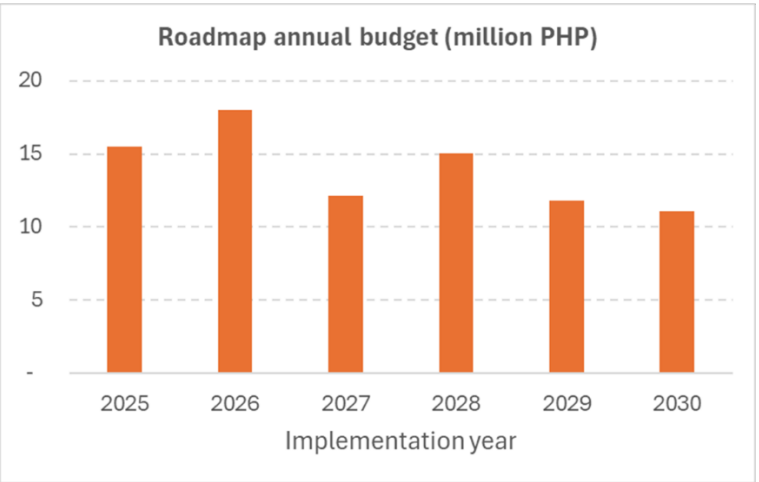

Figure 1. Estimated annual budget for implementing the roadmap across 2025-2030

5. MONITORING AND EVALUATION

The targets set for the activities (Appendix 7) are indicators for monitoring and evaluation. As mentioned earlier, the lead agency will communicate with the partner agencies to ensure the execution of those activities according to the targets and time plan, and the use of resources effectively. Online monitoring and evaluation platform will be available to report and regularly update the status of the roadmap activities and achievement[16].

[16] SFITAL project is developing such online monitoring and evaluation platform and will be integrated into the province's (PAGRO) portal.

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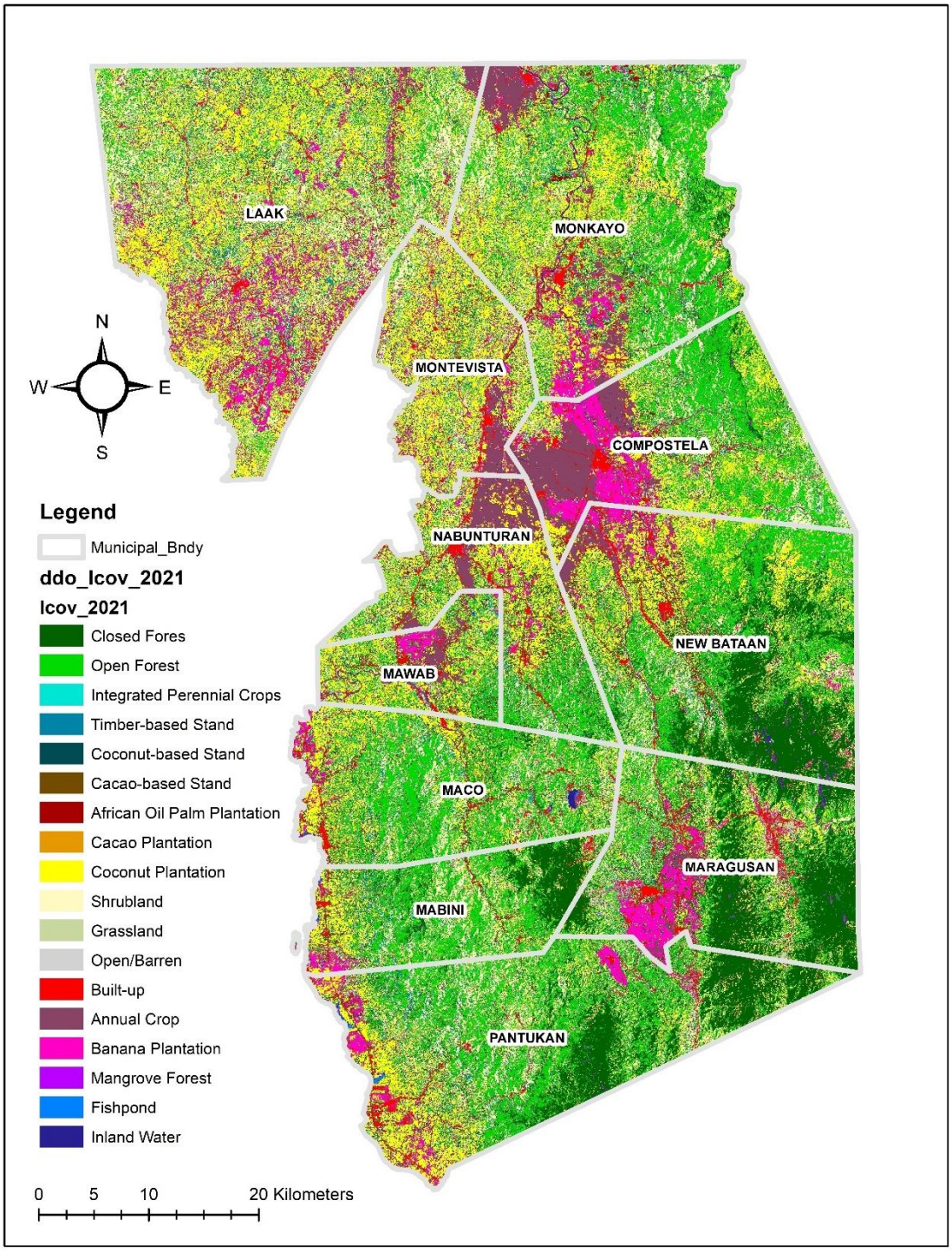
Appendix 1. Area coverage per land classification in Davao de Oro province

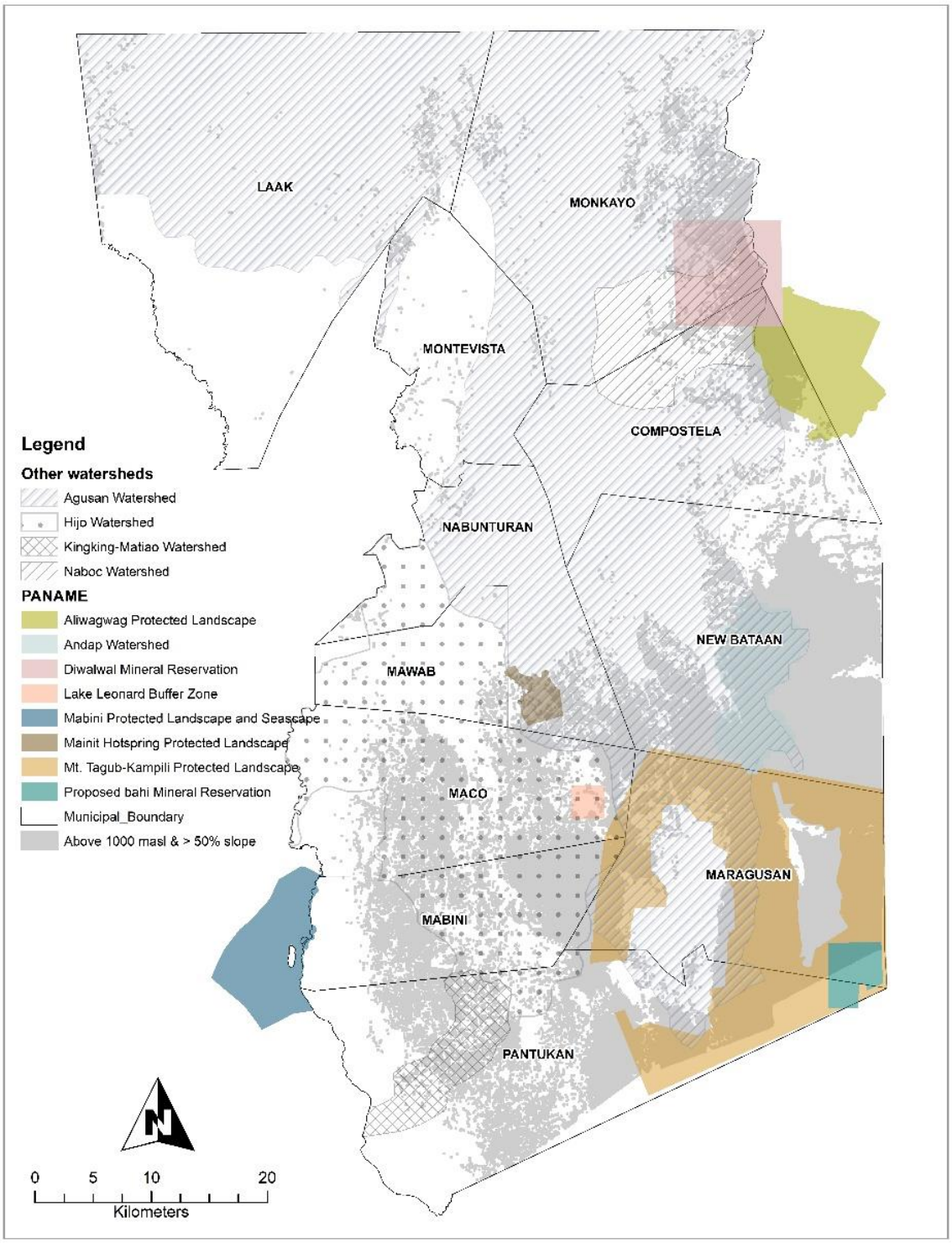
Municipality	Land area (ha)	Area coverage per land classification (ha)			
		A & D	Forestlands	% Share of A & D	% Share of forestland
Compostela	18,750	11,872	6,878	63.32	36.68
Laak	94,706	20,819	73,887	21.98	78.02
Mabini	41,225	7,892	33,333	19.14	80.86
Maco	24,440	8,105	16,335	33.16	66.84
Maragusan	39,429	11,766	27,663	29.84	70.16
Mawab	16,952	9,997	6,955	58.97	41.03
Monkayo	69,289	24,513	44,776	35.38	64.62
Montevista	26,500	11,325	15,175	42.74	57.26
Nabunturan	24,529	11,851	12,678	48.43	51.57
New Bataan	68,860	20,079	48,781	29.16	70.84
Pantukan	42,013	14,878	27,135	35.41	64.59
Total	**466,693**	**153,097**	**313,596**	**32.80**	**67.20**

Appendix 2. Land cover and protected areas in Davao de Oro province

Land cover distribution of Davao de Oro province in 2021 (source: SFITAL project)



Protected areas in Davao de Oro province (source: DENR-Region XI cited by Provincial Development Council, 2018)



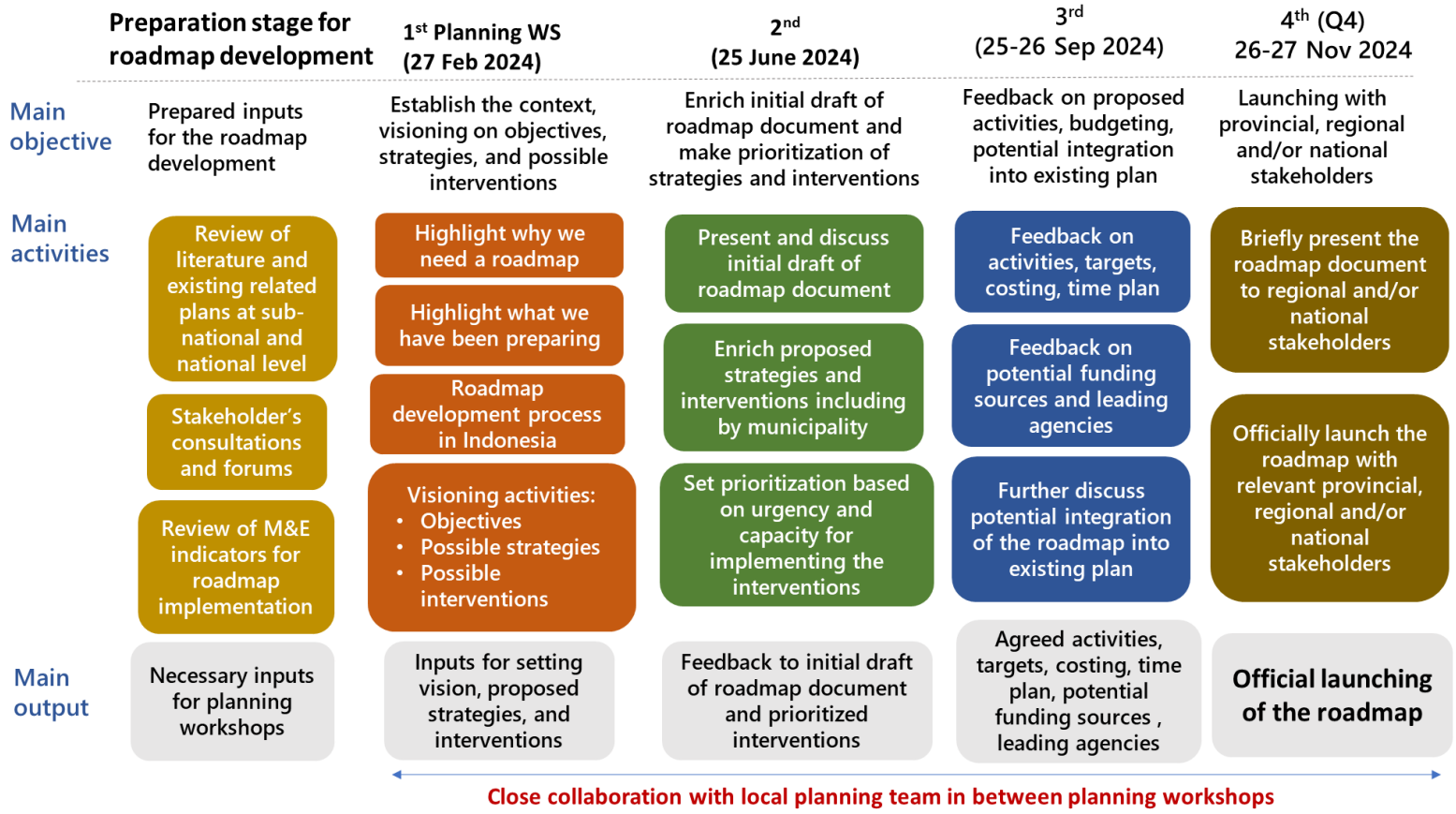
Appendix 3. Cacao production profile of Davao de Oro province

Municipality	No. of farmers	No. of planted (hills)	Bearing trees (hills)	Total Area	Potential Area (ha)	Production area (Mt)
Laak	1,938	874,835	404,915	1,749.67	2,310.94	769.3
Maco	1,296	477,500	204,506	833	2,300	147
Mabini	758	197,140.00	108,905	394.28	155.92	65.58
Pantukan	342	457,975	191,975	915.95	419.5	24.01
Mawab	302	90,510	44,555	181.02		5.34
Nabunturan	550	110,000	73,600	275	805	73.6
Montevista	673	391,650	96,735	785	21.8	255
Monkayo	611	206,500	147,500	410	468	16.27
Compostela	835	241,030	137,650	482.06	97	7.13
New Bataan	1,631	735,760	699,600	1,471.50	100	64
Maragusan	1072	776,652	432,502	698.9	1,430	389.25
Total	**10,008**	**4,559,552**	**2,542,443**	**8,196**	**8,108**	**1,817**

*Data Source MIS, Report 2023

Source: PAGRO HVCDP MIS Report 2023

Appendix 4. Preparation stage and four planning workshops for developing the roadmap



Appendix 5. Potential ecological benefits of implementing land use strategies and interventions outlined in the roadmap: assessment and projection using R-FALLOW

Land use plays a crucial role in ecosystem service generation and is closely related to landscape sustainability. However, agriculture has been a major driver of deforestation in developing countries such as the Philippines, where the expansion of cultivated areas often leads to loss of forest areas and associated biodiversity. Farmers' land use decisions are influenced by a variety of factors, including those that are market- and regulatory-driven, and it is essential to determine their potential impacts on land use choices, and in a larger scale, on a variety of ecosystem services.

Likewise, land use decisions by cacao farmers in Davao de Oro will determine the land use mosaic and ecosystem services generated by the landscape of the province. This highlights the need for ex-ante assessment to better understand the potential impact of cacao expansion and development in the province to different ecosystem services, including carbon storage for atmospheric greenhouse gas removal and forest connectivity which is closely related to biodiversity conservation. Carbon sequestration is a process by which atmospheric carbon is captured by plants and become biomass, a portion of which is referred to as carbon storage. While carbon sequestration helps reduce global warming, it also offers many benefits and co-benefits in the immediate environment, such as better microclimate and the positive effects of trees on soil health and soil water conservation. Habitat connectivity is the functional link between habitats that allows ecological processes and flows of genetic materials. An example of this is the species movements between habitat patches. The benefits of forest and habitat connectivity will be evident to local and regional communities, because landscape sustainability is closely related to biodiversity.

The R-FALLOW model[17] has been widely used for ex-ante assessment related to land use change over agricultural production landscape. This model was employed to assess the potential impacts of cacao expansion and development scenarios for Davao de Oro driven by farmers' land use decisions and government's regulations, on the dynamic of total aboveground carbon storage over the province's landscape. Part of the cacao expansion and development scenarios is the 'green' intervention in which remaining forest areas are protected for biodiversity conservation purpose. The scenarios mimic the strategies and interventions outlined in the Roadmap for Sustainable Cacao Development in Davao de Oro for 2025-2030, Vision to 2050 developed together by all stakeholders in the province and the SFITAL project. The projection of forest areas over the province's landscape by the R-FALLOW model was used to assess forest connectivity.

There were three scenarios assessed using R-FALLOW namely, **(1) Business as usual (BAU)** which will reflect the projection based on current situation without any intervention, **(2) Forest protection**, in which more forest areas are protected for ecosystem services and biodiversity conservation, and **(3) Sustainable cacao agroforestry practices and incentives**, which reconciles forest protection and

[17] R-FALLOW (Forest, Agroforest, Low Value, Landscape or Wasteland?) model is a computer simulation tool developed using R language and available online: https://rfallow.agroforestri.id/. Its user manual is available at https://cacaomustahan.com/r-fallow-users-manual/.

cacao development over the province. A more detailed description of the three scenarios is provided in Table 1.

Table 1. Three scenarios representing roadmap strategies and interventions assessed using R-FALLOW

Scenarios	**Interventions**	**How interventions were translated into R-FALLOW**
Business as usual (BAU)	No intervention: • Simple cacao-based practices • Protection of only NIPAS (National Integrated Protected Areas System) areas • No co-investment or market incentive for cacao development	
Forest protection	Apart from NIPAS, forest lands with elevation > 1000 masl and slope >30% are protected for e.g., water and climate regulation, carbon storage, biodiversity etc.	Reserve map also includes the forest lands with elevation > 1000 masl and slope >30%
More sustainable cacao agroforestry practices and incentives	In addition to forest protection intervention: 1. Improved cacao practices having a higher agrobiodiversity and income diversification (e.g., by integrating fruit trees) 2. Improved planting materials and plot management prolongs cacao productive stage by 12 years 3. Integration of 'big' fruit trees and native N-fix trees increases aboveground carbon storage up to 40% 4. Promoted through agricultural extension service 5. Co-investment scheme with public and private sector to help cover establishment cost 6. No change in cacao price is assumed, however higher cacao productivity and longer peak production stage (intervention 2) lead to an increase in total income by 13-25% compared with that of 'old' cacao practice depending on crop densities and maintenance efforts by farm households	1. New cacao-based practice (ID 21-24) with diversification of cacao clones (up to 4 different clones) within one plot, coconuts, more permanent banana cover, fruit trees (e.g., *Lansium domesticum*), native N-fix trees 2. Length of cacao productive stage becomes 16 years (4-20 years old), initially only 4 years (4 years i.e., 4-8 years old) and higher quality planting material increases cacao yield up to 25% 3. Aboveground biomass in all production stages (pioneer, early-, peak-, and post-production) increases by 40% 4. Available extension for the improved cacao practices = 1, and openness to and credibility of that extension = 1. No more extension for the 'old' cacao-based practice (not recommended anymore by the government). There is local willingness to cultivate the improve cacao: 'cultural deliberation' = 0.8 5. As follow: • Establishment cost of improved cacao practices is higher up to 67% compared with that of 'old' cacao • Maintenance cost is higher up to 50% • Co-investment from public and private enablers (e.g., subsidy of planting materials) covers establishment cost by 50% 6. Return to lands and return to labor of the improved cacao practice increase by 13-25% 7. New map of distance to 'processing industries' for cacao

Scenarios	Interventions	How interventions were translated into R-FALLOW
	7. More consolidation (cacao bean collection) points provided by private enables	

Land use areas and carbon storage

Under the BAU scenario, the combination of favorable factors such as profitability, land suitability, extension support, and the growing recognition of cacao as a sustainable cash crop, is projected to increase the area of annual and perennial crops including cacao cultivation over the next 30 years, partly replacing forest and coconut cultivation areas (Figure 2). Forest area will decline sharply over the first 10 years due to the absence of forest protection intervention, and then it remains stable across the next 20 years, thanks to natural barriers namely, the areas are e.g., too steep and are therefore not suitable for crop cultivation. Without such natural barriers, a much larger forest area will be converted into crop cultivation.

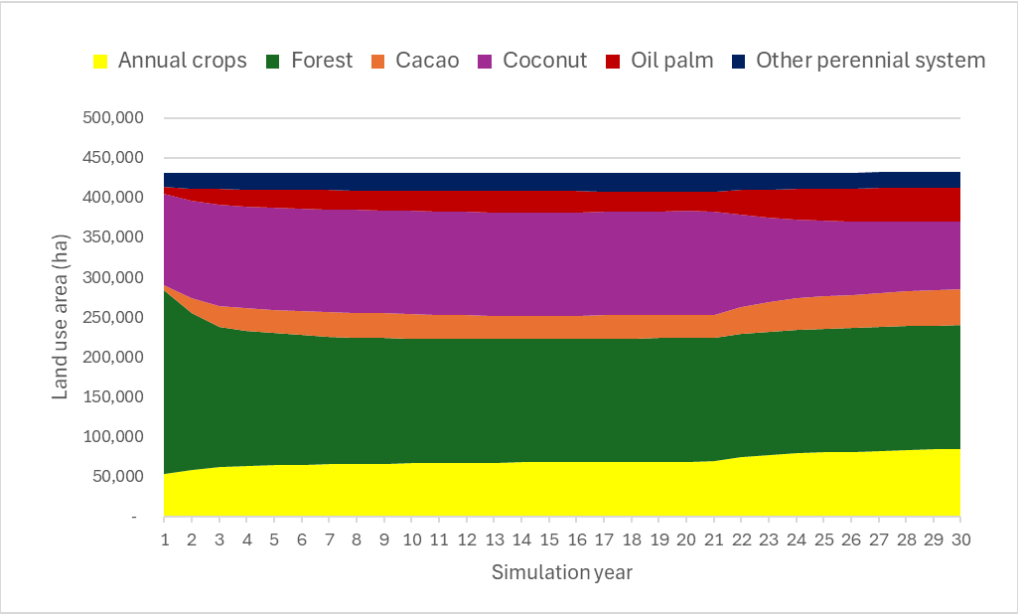


Figure 2. Projected land use area over the next 30 years by R-FALLOW model under the business-as-usual scenario

As expected, the forest protection and sustainable cacao development scenario are projected to have a larger forest area at the final of the simulation (namely, year 30) because of forest interventions (Figure 3). However, these will be limiting the expansion areas of crop cultivation including cacao. For example, by year 10, cacao cultivation areas in the two scenarios are less by 3,565–6,339 ha compared with that in BAU. Larger differences were found at year 30 namely by 5,486–5,982 ha. By year 30, the forest protection and sustainable cacao development scenario could prevent 4,122–7,079 ha of forests from being converted into other land uses. The larger protected forest areas in the other two scenarios compared with BAU will generate a difference in aboveground carbon storage as much as 0.60-1.10 million tC by simulation year 30, compared with BAU.

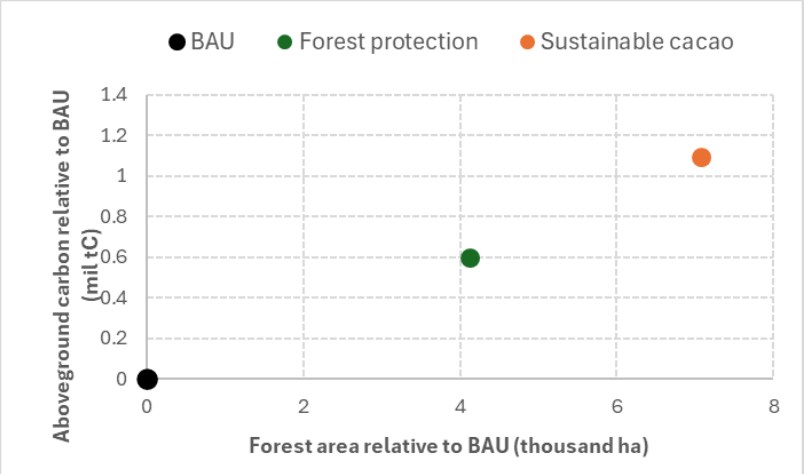


Figure 3. Forest area and aboveground carbon storage in forest protection and sustainable cacao development scenarios relative to business-as-usual condition

Forest connectivity

The forest connectivity analysis used projected land use distribution and areas from R-FALLOW and FragStats software[18]. Four indexes were calculated namely (1) core area = internal area of a patch, away from the 100 m edge, (2) Patch density = total number of patches over a landscape (ha), (3) connectance = number of structural joining between similar land use types within 500 m distance, divided by the total number of possible joining among all land use types, and (4) similarity index = sum of all neighbouring patches within 500 m multiplied by a specific similarity coefficient for a land use type, divided by the nearest distance squared (m^2) to the neighbouring patch. The four indexes were calculated both for young and mature forests. Young forests refer to young secondary forests while mature forests combine old secondary and primary forests[19].

The differences among scenarios are mainly in (1) Core area index of young forests, (2) Connectance index of young forests, and (3) Similarity index of mature forests (Figure 4). These indicate that:

- There are larger areas of young forests in the forest protection and sustainable cacao development scenarios compared with BAU, and furthermore, the areas are more connected in the two scenarios.
- The level of similarity between mature forests and neighbouring land uses is much higher in the two scenarios, because of the presence of more integrated practices such as cacao agroforestry.
- Therefore, the forest protection and sustainable cacao development scenarios have a better level of habitat connectivity compared with BAU, and this will have a positive influence on the capacity of the landscape under the two scenarios for biodiversity conservation.

[18] This is an open-source software available at https://www.fragstats.org/index.php. The analysis used 100 x 100 m resolution land use maps from R- FALLOW. To run the analysis using the software, the edge width was set at 100 m and connection search distance was at 500 m.
[19] In R-FALLOW, forests are divided into four evolution stages: (1) pioneer, (2) young secondary, (3) old secondary, and (4) primary forests. Pioneer forests namely forest lands with e.g., grass or shrubs were not included in the habitat connectivity analysis.

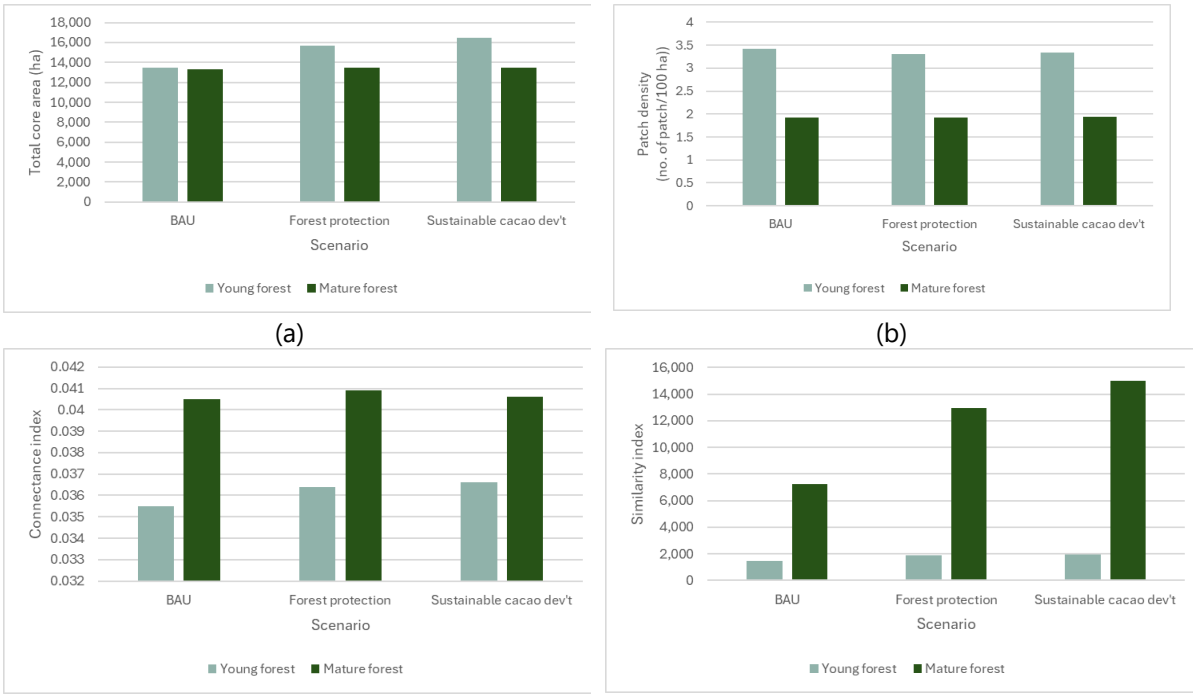


Figure 4 Four indexes of habitat connectivity: (a) total core area, (b) patch density, (c) connectance, and (d) similarity index, for young secondary and mature (old secondary and primary) forests

Appendix 6. Investment plan and potential funding sources

Strategy 1. Sustainable land use allocation for cacao production

Activity	Target	2025	2026	2027	2028	2029	2030	Cost category	Sub-activities	Cost (PHP)	Funding sources/ cost-sharing agencies
Intervention 1.1. Designate main cacao production areas and identify possible areas for expansion, rehabilitation, and rejuvenation of cacao farms.											
1. Stocktaking of available cacao suitability maps (e.g., SARAI, SFITAL, BSWM), identify parameters of suitability, and adopt the suitability maps for the province	1 provincial cacao suitability map adopted by province	100,000						MOOE and Personnel Services	3 Meetings (45k), data gathering (30k), printing and binding (25k)	100,000	PAGRO, MLGUs, BSWM
1.1. Identify parameters of suitability	Parameters of suitability (especially the socio-economic aspects) identified with local stakeholders										DA XI PCA
2. Stocktaking of existing information on cacao producing areas and their conditions	1 provincial cacao commodity profile prepared	100,000						MOOE and Personnel Services	2 Meetings (30k); data collection and compilation, field survey/FGD, analysis and documentation (70k)	100,000	DA, PAGRO, MLGUs, PSA, DTI, DENR, NCIP
3. Harmonization of the the existing cacao-related maps and produce an integrated land use map for cacao development, by involving key stakeholders including provincial/local government units, agricultural experts, cacao farmers, community leaders, and environmental groups.	1 integrated land use map for cacao developed and adopted for the province		80,000					MOOE (Food expenses, Office supplies, Printing & binding)	Meetings, 2-day workshop, Adoption of maps to Provincial Development Council (PDC)	80,000	PLGU DDO, DA, PPDO, PENRO
4. Identification of suitable barangays for cacao expansion based on biophysical conditions, to include suitability with existing crops species	Map of existing crop species 1 List of suitable areas for expansion	50,000						MOOE (Travel, Representation)	Profiling/ Data collection	50,000	PAGRO, MLGUs, DA, PENRO, DTI-RAPID, DAR, NCIP

Activity	Target	2025	2026	2027	2028	2029	2030	Cost category	Sub-activities	Cost (PHP)	Funding sources/ cost-sharing agencies
5. Identification of cacao clusters for cacao production.	10 cacao clusters identified and monitored	21,000	35,000	14,000				Salaries and wages and MOOE (travel, representation)	1 Meeting (20 pax, 10k); baseline data/cluster profiling, cluster member assessment, and identification (travelling expense to 5 clusters 20k)	70,000	DA, PAGRO (BAEW), MLGU, NGOs, DTI-RAPID,
Intervention 1.2. Develop recommended models of cacao farms and suitable crop components to reconcile economic and ecological benefits.											
1. Identification of existing cacao farms that qualify as Model Farms which can serve as training centers for local farmers.	1 set of qualifying parameters for a model farm established 11 potential model farms in a strategic location identified		40,000					MOOE (Travel, Representation)	Data collection, farm visits and evaluation of the farm (considering existing infra) (20k), consultation/meetings (20k)	40,000	DA, ATI, TESDA, PAGRO, MLGUs
2. Mobilization of resources for the establishment of learning farms through co-investment schemes by collaborating with agricultural institutions, extension services, and industry experts in 11 municipalities.	1 collaboration activity At least 3 co-investment schemes developed.	120,000						MOOE (Food expenses)	Planning & implementation resource and learning sharing (90k) Follow up meetings (30k)	120,000	DA, ATI, TESDA, PAGRO, DTI
2.1. Facilitation in the accreditation of the learning farms as ATI Learning Site for Agriculture and as TESDA Farm School.	At least 3 learning farm/ farm school accredited per year		230,000	230,000	23,0000			MOOE (Registration fees and processing expense, food expenses)	Site selection Application for LSA Accreditation from ATI (50k) Conduct of Trainings and competency assessment (50k) Program Registration and Accreditation under Unified TVET Program Registration and Accreditation System (UTPRAS) (100k) 2 Coordination meetings (30k)	690,000	DA, ATI, TESDA, PAGRO, MLGUs, FCA
3. Establishment of accredited learning farms in each municipality	At least 3 learning farms established		1,000,000	1,000,000	1,000,000			MOOE (supplies and materials) Capital Outlay	Site selection/FCA/ farmer cooperator identification Briefing and orientation Geo-tagging activities	3,000,000	DA, ATI, PCA, TESDA, DTI, DAR, PAGRO, DOLE through PESO-LGU, MLGUs, FCA, PhilMech,

Activity	Target	2025	2026	2027	2028	2029	2030	Cost category	Sub-activities	Cost (PHP)	Funding sources/ cost-sharing agencies
								(operational costs)	Field lay-out and design preparation Provision of farm inputs Establishment of the farm including farm infra Training & Capacity building		and private sector identified in 1.2.2.
4. Promotion of the model farm and its activities to a broader audience	At least 2 farm tours per year		250,000	250,000	250,000	250,000		MOOE (Fees and registration, travelling allowance)	Conduct farm visits of interested cacao farmers & FCAs	1,000,000	DA, PLGU-IPRD, PAGRO, ATI, PLGU and MLGU-Tourism Office
5. Regular monitoring of the farm's performance, including productivity and the effectiveness of demonstrated practices using the form created under 4.1.2.	Filled out farm record, monitored quarterly per farm		24,000	24,000	24,000	24,000	24,000	MOOE (Travelling allowance)	Monitoring and evaluation (2 personnel, 4 quarters *4k each)	120,000	PAGRO, MLGU
Intervention 1.3. Assess economic and ecological impacts of several land use interventions at municipality or province scale and conduct trade-off analysis to help understand associated risk and benefits for decision making.											
1. Identification of lead agencies (linked with Strate 6) for collaborating with research and development agencies to gather and analyze inclusive data required for impact assessment and trade-off analysis.	At least 1 multistakeholder collaboration activity conducted		30,000					MOOE (food expenses)	Collaborative meetings	30,000	DA- Research, DDOSC, UP Min, (if no need for actual funds transfer) NGOs, PLGU
2. Conduct of ecological assessment	One (1) Ecological Assessment conducted										DA- Research, DDOSC, UP Min, (if no need for actual funds transfer) NGOs, PLGU
3. Conduct of a series of workshops, FGDs, and public consultations for participatory planning based on ecological assessments.	At least 2 participatory planning events conducted		100,000					MOOE (food expenses)	Consultation activity (30k) Planning workshop (70k)	100,000	DA- Research, DDOSC, UP Min, (if no need for actual funds transfer) NGOs, PLGU

Strategy 2: Improving access of the cacao farming community to livelihood capitals

Activity	Target	2025	2026	2027	2028	2029	2030	Cost category	Sub-activities	Cost (PHP)	Funding sources/ cost-sharing agencies
Intervention 2.1. Assist cacao farming community to better access crop insurance.											
1. Stocktaking of existing crop insurance programs in the province	1 list of insurance providers	240,000						Salaries and wages, travelling expenses	Data collection (36k/mo), updating of data (4k/mo)	240,000	PCIC
2. Facilitation of access to various crop insurance programs through information sessions, radio, newsletters, online communication platforms such as social media and a centralized information platform.	At least 6,000 farmers		740	740	740	740	740	Salaries and wages and communication allowance	Data collection (800/quarter), uploading of data (500 comm expense)	3,700	MLGU, PCIC, PAGRO,
3. Integration of crop insurance topic in training, including how to access insurance.	11 trainings in the first year, then 22 trainings on the following year with crop insurance integration	440,000	880,000	880,000	880,000	880,000	880,000	Meal and snacks	Trainings (40k/training)	4,840,000	PCIC, DTI Rapid and PAGRO, MLGU
Intervention 2.2. Improve access to farm inputs to include quality planting materials (multiple cacao varieties, grafted seedlings, etc.), farm tools, by e.g. strengthening collaboration with national government agencies, academe, non-government organizations, private enterprises, and farmer organization.											
1. Stocktaking of the private agencies, academe, non-government and government organizations who can potentially provide farm inputs such as good quality planting materials, farm tools, etc.	1 Stocktaking activity and yearly updating	50,000	50,000	50,000	50,000	50,000	50,000	Representation	1 Meetings / year	300,000	DA, PAGRO
2. Development of partnership agreements for the provision of quality planting materials including multiple clones that are climate-resilient and disease-tolerant, farm tools, etc.	At least 3 partnership agreements	20,000	20,000	20,000				Salaries and wages, TEV Representation printing and binding	FGD, meetings and consultation, in house review, data collection and gathering publication	60,000	DA- Research / Academe, NGO
3. Development of potential and adopt existing sustainable	2 modalities developed	20,000		20,000				Donation or MOOE	FGD, meetings and consultation	40,000	

Activity	Target	2025	2026	2027	2028	2029	2030	Cost category	Sub-activities	Cost (PHP)	Funding sources/ cost-sharing agencies
modalities for providing farm inputs.	Each modality adopted in 3 municipalities the province		2,500,000		2,500,000					5,000,000	DA
4. Stocktaking of existing nursery operators and identify aspiring farmer organizations to become nursery operators	1 list of nursery operators to be updated every 2 years	50,000						Representation	Meeting	50,000	DA-BPI
5. Conduct of capacity-building activities for operators and aspiring farmer organizations on cacao nursery management practices and nursery accreditation to BPI	1 training / year	50,000	50,000	50,000	50,000	50,000	50,000	Representation with venue, professional fee, tagging fee (mother plant) application fee	Conduct of training, conduct evaluation of mother plant, data collection	300,000	DA- BPI, FCAs
6. Facilitation of new clones to BPI-National Seed Quality Control Service	2 new clones registered to BPI			30,000			30,000	Representation, professional fee, certification fee	Conduct evaluation, data collection, payment application	60,000	DA-BPI, Academe, NGAs
7. Provision of support to farmer organizations and individual farmers for community-based nursery establishment, enabling them to produce high-quality planting materials and multiple cacao varieties & clones.	3 community-based nurseries established			600,000		600,000	600,000	Representation, procurement of inputs and traveling expenses	Conduct consultation, provision of farm inputs, conduct project monitoring	1,800,000	DA, NGOs, FCAs, PAGRO
8. Facilitation of the establishment of community-based organic fertilizer plant	3 community-based organic fertilizer plant established per year)	250,000	250,000	250,000	250,000	250,000	250,000			1,500,000	TESDA
9. Facilitation of the establishment of village-type biological control agents for pests and diseases. (what type of village example QUARANTINE type)	2 village-type biological control agents created		1,000,000	1,000,000						2,000,000	DA
10. Upgrading of LGU operated plant nurseries and establishment of clonal garden in compliance to BPI accreditation.	4 operated nurseries by PLGU and MLGU		500,000	500,000	500,000	500,000		Procurement of inputs, representation, expenses	Upgrading of LGU operated nursery (500k/site)	2,000,000	DA, LGUs

Activity	Target	2025	2026	2027	2028	2029	2030	Cost category	Sub-activities	Cost (PHP)	Funding sources/ cost-sharing agencies
Intervention 2.3. Equip farmer organizations to engage in fermentation, drying, and other postharvest operations in cacao production for increased bean quality.											
1. Stocktaking of farmer organizations and clusters who can engage in cacao consolidation and processing	5 clusters per year	30,000	30,000	30,000	30,000	30,000	30,000	Traveling expenses, representation	Conduct meetings, consultation and monitoring	180,000	DA and MLGU
2. Provision of comprehensive training manuals, guides, and visual aids that explain the criteria and standards for bean classification and grading, and possibly upload these in a centralized information system, linked to more accessible communication platforms such as social media, radio, etc	1 comprehensive manual to be updated every 3 years		100,000		100,000			Communication fee or royalty fee and rep exp.	Craft manual and upload to social media platforms	200,000	NGO, PLGU, ICRAF
3. Provision of training for farmer organizations and facility operators on the best practices for cacao processing, including drying and fermentation techniques.	2 FCAs or cluster per year; 1 training for facility operators per year	40,000	40,000	40,000	40,000	40,000	40,000	Training expenses and bench marking activities	Conduct of training every 2 years for updating of knowledge	240,000	ATI, DOST, DA, DTI, DAR, TESDA, NGOs
4. Enhancement of existing cacao postharvest and processing facilities by supporting farmer organizations and cooperatives in acquiring product quality standard certifications. (Enhancement of existing Cacao post-harvest/processing facilities by organizations / coops must be qualified to FDA standards	3 FCAs		500,000		500,000		500,000	Capital Outlay	Procurement of postharvest facility, conduct of GMP trainings, facilitate conduct coaching and certification for LTO permit	1,500,000	DA, DTI, DOST
5. Provision of improved postharvest and processing facilities (e.g., fermentation boxes, dryers, etc.) to selected farmer organizations and cooperatives	3 cluster/ FCAs			1,000,000	1,000,000	1,000,000		Capital outlay	Provide improved post-harvest facility	3,000,000	DOST, DA, DA-PhilMech, DOLE, DTI
6. Conduct of training focused on bean classification and grading techniques, with hands-on activity for farmers.	2 trainings per year	80,000	80,000	80,000	80,000	80,000	80,000	Training exp., TEV	Conduct trainings (1M/FCA)	480,000	DA, DTI, ATI
Intervention 2.4. Establish more consolidation points in strategic locations to improve market access, strengthening collaboration with national government agencies, academe, the private sector, Provincial Cacao Council, and cooperatives											

Activity	Target	2025	2026	2027	2028	2029	2030	Cost category	Sub-activities	Cost (PHP)	Funding sources/ cost-sharing agencies
1. Organizing training workshops on topics such as supply chain management, logistics, quality control, and financial management.	5 trainings conducted		10,800	10,800	10,800	10,800	10,800	Training exp.	Conduct training and workshop	54,000	DA, DTI, ATI
2. Facilitation of farmers and farmer organizations to engage in clustering and venture into consolidation to streamline the supply chain and improve efficiency.	6 clusters (1 cluster per year)		30,000	30,000	30,000	30,000	60,000	Representation exp. Traveling exp.	Conduct evaluation and meetings	180,000	DA, PAGRO, MLGUs, FCAs
3. Endorsement of the potential new clusters to F2C2 program of the Department of Agriculture.	6 clusters FCAs (1 cluster per year)	6,000	6,000	6,000	6,000	6,000	6,000	Traveling expenses	Endorse to DA possible cluster group (1 TEV/technician,	30,000	PAGRO, MLGUs, DA
4. Assessment of each farmer and organization's capacity to function as a consolidation hub based on factors such as infrastructure, management skills, financial health, and membership size.	3 FCAs assessed		50,000	50,000	50,000			Rep. Exp.	Conduct consultation and meetings	150,000	DA, DTI
5. Provision of support to organizations in upgrading or acquiring necessary infrastructure and equipment, such as warehouses, processing facilities, and transportation.	3 FCAs supported			2,000,000	2,000,000	2,000,000		Rep. Exp. and Capital outlay	Conduct FCAs evaluation (40k/ FCA)	6,000,000	DA, DA-PHILMech,DOST, DTI, DOLE, PRDP
6. Creation and adoption of Standard Operating Procedures for consolidation hub operations, including procedures for collection, sorting, storage, and distribution of cacao.	1 SOP updated every 2years;		7,500		7,500		7,500	Rep. Exp.	Conduct coordination meeting, writeshop SOPs	45,000	MLGU, PAGRO, FCAs
	3 FCAs newly adopting the SOP			7,500	7,500	7,500					
7. Regular monitoring (once a month) of the performance of consolidation hubs, including efficiency in operations, financial performance, and impact on farmers	3 consolidation hubs; Once a month monitoring		10,000	10,000	10,000	10,000	10,000	Traveling exp. And Rep. Exp.	Conduct monitoring and project evaluation (10,000/month for TEV, fuel for 2 technicians, and conduct of meetings 2 twice a year FCAs officer)	50,000	PAGRO, MLGUs
Intervention 2.5. Improve entrepreneurial skills of cacao farming community including women and youth to increase their ability in finding new market opportunities, including product development.											
1. Provision of assistance to farmers in obtaining certifications (PhilGAP) to access premium markets.	10 individual farmers, 1 FCAs per year	50,000	50,000	50,000	50,000	50,000	50,000	Travelling exp	Conduct coaching, mentoring and PhilGAP training	300,000	DA, PAGRO, MLGU, FCAs

Activity	Target	2025	2026	2027	2028	2029	2030	Cost category	Sub-activities	Cost (PHP)	Funding sources/ cost-sharing agencies
2. Integration of gender sensitivity, financial literacy, and entrepreneurship in cacao-related trainings.	2 training sessions per year	80,000	80,000	80,000	80,000	80,000	80,000	Training expenses	Conduct training on business entrepreneurship	480,000	DTI, DA- AMAD, DOST
3. Conduct training on product development and promotion (packaging, labeling, etc.)	2 training sessions per year	80,000	80,000	80,000	80,000	80,000	80,000	Training expenses	Conduct training on product development	480,000	DTI, DA- AMAD, DOST
4. Conduct of mentorship activities by linking cacao farming community with experienced entrepreneurs	5 mentorship activities per year	100,000	100,000	100,000	100,000	100,000	100,000	Meals and snacks, fuel	Conduct mentorship activities	600,000	DTI, DA, DOST
5. Facilitation of product investment and promotion through trade fairs, business matching activities, and market brokering sessions where farmers/farmer organizations/MSMEs.	5 investment activities per year	250,000	250,000	250,000	250,000	250,000	250,000	Representation expenses	Conduct investment activity	1,500,000	DTI, DA-AMAD, PLGU-Investment
6. Integration of enterprise information into the centralized information system linked to more accessible knowledge platforms to be developed in 4.3.	1- integrated enterprise information system, updated regularly							Communication fee	Upload information system	Inputted in strategy 4	ICRAF, NGO
Intervention 2.7. Improving and establishing farm-to-market roads											
1. Conduct of an inventory of road networks that need to be improved based on the location of existing cacao farms and plans for expansion and development.	Develop 1 inventory for road networks that need to be improved for cacao expansion; Update the inventory every year	6,000	6,000	6,000	6,000	6,000	6,000	Travelling allowance and communication allowance	Conduct inventory	36,000	PPDO, DPWH, DA
2. Integration of the cacao development into the FMR Network Plan of Davao de Oro.	Cacao development integrated into FMRNP (1 plan to be updated every 3 years)	30,000		30,000		30,000		Rep. expenses	Conduct consultation	90,000	DA- RAED, PAGRO
3. Development of linkage with the national agencies for funding access for FMR development	1 collab. activity per year	15,000	15,000	15,000	15,000	15,000	15,000	Rep. expense	Conduct collaboration activity	90,000	DA-RAED, DA-PRDP, DPWH, DTI-RAPID

Strategy 3: Increasing productivity and income diversification of cacao farms

Activity	Target	2025	2026	2027	2028	2029	2030	Cost category	Sub-activities	Cost (PHP)	Funding sources/ cost-sharing agencies
Intervention 3.1. Promote sustainable cacao farming practices through extension services, integration of cacao into education curriculum and provision of training manuals.											
1. Stocktaking of institutions and rural development projects with capacity building activities and uploading the information in the centralized information platform.	1 list of research and extension institutions to be updated annually; 1 list of research needs in the province to be updated annually	80,000						MOOE (TEV)	Meetings (10k each), data gathering Coordinate with PICTO for the materials and information to be uploaded (2k/pax, 5 pax/year)	240,000	DA, DTI, PAGRO, PLGU, ICRAF
	Upload at least 5 knowledge products/ year	26,667	26,667	26,667	26,667	26,667	26,667				
2. Development of comprehensive training manuals and guides on cacao agroforestry practices tailored to different levels of farmers' expertise and educational backgrounds	1 comprehensive training manual and guide developed (updated every 3 years)	388,000						MOOE (Representation venue and accommodation)	2 day-Consultation workshops (4,000/pax, 40 pax) 2 day Writeshop Technical Review Stakeholders consultation Finalization	320,000 10,000 48,000 10,000	DA, DTI, PLGU, NGO, Academe, Private, ATI, TESDA
3. Establishment of partnership agreement for capacity building events with private sector, high schools, state colleges, NGOs, rural development projects, and extension institutions in the conduct of capacity building events.	Established 2 partnerships per year	100,000	100,000	100,000	100,000	100,000	100,000	MOOE (Representation)	8 Meetings/year (50pax)	600,000	DA, DOST, academe, PLGU
4. Establishment of partnerships to integrate agroforestry and agroecology topics into curriculum of High Schools and State Universities and Colleges.	Partnership with 2 high schools and 2 SUCs/year to integrate agroforestry and agroecology topics into their curriculum.	15,000	15,000	15,000	15,000			MOOE (Representation)	4 Meetings	60,000	DA, DTI, PLGU
5. Distribution of printed learning materials to farmers	Distribute 500 copies /year printed learning materials to farmers		100,000	100,000	100,000	100,000	100,000	MOOE (Printing and binding)	Printing and photocopy	500,000	DA, DTI, PLGU, ATI
6. Application of sustainable farming practices through Good Agricultural Practices and crop diversification in cacao expansion, rehabilitation and rejuvenation areas, and in demonstration farms.	10 cacao farms newly adopting Good Agricultural Practices; 2 con-investment plans for rejuvenation and	2,670,00 2,670,00	2,670,00	2,670,00	2,670,00	2,670,00	2,670,00	MOOE (Representation)	Trainings Coordination Meetings with demo farm cooperators 2-day consultation	18,000,000 480,000 33,000 144,000 30,000	DA, DTI-RAPID, DAR, PCA, academe, NGO, private sec

Activity	Target	2025	2026	2027	2028	2029	2030	Cost category	Sub-activities	Cost (PHP)	Funding sources/ cost-sharing agencies
	rehabilitation per year to be updated every 2 years								workshop 2-day writeshop Technical review Inhouse review		
7. Provision of incentive programs such as grants, scholarships, and recognition awards to encourage the participation of women and youth in cacao farming	Conduct 1 recognition awarding for cacao farmers with three categorie4s (Biggest pods, biggest, biggest beans, best quality);		324,000	324000	324000	324000	324000	MOOE (Donations)	Recognition awards Meetings Call for entry Evaluation of entries Awarding Scholarship: Meetings Creation of Guidelines Submission of application Examination Posting of result	1,620,000	DA, PLGU-PAGRO
	10 beneficiaries/year of scholarship to children of cacao farmers for taking agriculture-related courses										
Intervention 3.2. Improve extension service and mentorship program for cacao farming community, including women and youth											
1. Mobilization of resources for staffing of agricultural extension workers, including the provision of incentives for barangay extension workers and Cacao Mentors involved in cacao development	Provision of Honorarium to 10 Cacao mentors/year 12 cacao focal person designated in the Provincial (1) and Municipal LGU (11)		288,000	288,000	288,000	288,000	288,000	MOOE (Professional fees), 2,000/month		1,440,000	DA, FCAs, PLGU, Private sector, NGOs
2. Capacitation of farmer organizations and barangay extension workers, and Cacao Mentors (Farmer/Coops/and Associations) to provide on-site support and advisory services to cacao farmers.	11 training courses per year	333,333	333,333	333,333	333,333	333,333	333,333	MOOE (Representation), Training kits (pens, notebooks, shirt or others)		2,000,000	DA, DTI, PLGU, Private sector, NGOs
3. Implementation of recognition programs or awards and incentive programs for exceptional agricultural extension workers	1 recognition awarding AEWs;		100,000	100,000		100,000	100,000	MOOE (representation and donation)	Meetings Crafting of guidelines Call for entry Evaluation awarding	500,000	PLGU, DA
	13 AEWs submitted										

Strategy 4: Sustainable improvement of supply and market value chain

Activity	Target	2025	2026	2027	2028	2029	2030	Cost category	Sub-activities	Cost (PHP)	Funding sources/ cost-sharing agencies
Intervention 4.1. Improve governance, connectivity, fairness, and transparency of supply and market value chain by strengthening collaboration between public and private sector to include Cacao Industry Council.											
1. Mapping of stakeholders in Davao de Oro (per LGU) by supply chain network (input providers, farmer and their affiliations, traders, consolidator, processor) with contact details, description of operation, and geographic location	1 complete list of cacao supply chain actor mapped and updated annually, including farmers registry	440,000	440,000	440,000	440,000	440,000	440,000	MOOE, Travel expenses (include fuel), Food expenses	Data gathering and consultation, Meeting	2,640,000	DA, DTI-RAPID
2. Stocktaking of available information on cacao production and supply and market value chain from stakeholders identified in 4.1.1.	1 inventory of available information, to be Updated yearly							MOEE – rep expenses	Conduct stocktaking activity	included in the budget in 4.1.1	ICRAF
3. Collection of available information from cacao stakeholders in Davao de Oro (e.g., mass of beans collected by the buyers per barangay per week by form of beans, mass of beans processed by cooperatives, etc.)	100% private companies that supply information;	U	U	U	U	U	U	MOOE (food expenses, travelling allowance), include fuel Food expenses	Data gathering and consultation, Meeting	2,640,000	DA, DTI-RAPID
	100% FCAs that supply information	440,000	440,000	440,000	440,000	440,000	440,000				
	Barangay. Agricultural Extension Workers (AEWs) institutionalized to gather datal, and disseminate information to cacao farming communities										
4. Collaboration with agencies that can monitor and handle the centralized information system (e.g., Provincial LGU, Provincial/Municipal Cacao Council, Academe, DA) (Sources of Information	1 collab activity	100,000						Meals and Snacks, TEV	Conduct collaboration activity	100,000	ICRAF, PCA (CFIDP)

Activity	Target	2025	2026	2027	2028	2029	2030	Cost category	Sub-activities	Cost (PHP)	Funding sources/ cost-sharing agencies
5. Working with agricultural extension services, cooperatives, and NGOs to promote the platform and integrate it into existing support structures.	Platform shared in 10 extension activities							Representation exp., traveling exp.	Share the System in meeting and capacity building events	Inputted in 1.3.3, 2.1.3., 2.6.6., 2.3.2., 2.4.8., and 2.5.1.	IPRD, ICRAF
6. Implementation of the digital centralized information platform on cacao production, post-production, market opportunities, training programs, and climate information. Ensuring that this platform is farmer user-friendly and available in the local dialect. (Harmonizing training resources)	1 centralized digital platform developed;	400000						Communication fee, salary and wages	Developed digital platform, capacitation of farmer-users	400,000	ICRAF, PAGRO
	At least 2 capacitation activities for target users										
	Weekly post in any digital platform										
7. Provision of high-end equipment such as laptop, drones, Cellphones, Tablets, etc. to LGU workers.	At least 2 units of laptop per office for PAGRO and MAGROs;	1,700,000	1,700,000	1,700,000				Capital Outlay (Equipment)	Procurement and donation of equipment	5,100,000	DA, PLGU, MLGU
	At least 1 unit of smartphone per MLGU										
	At least 1 unit of motorcycle per MLGU										
	At least 2 units of drones for PAGRO										
8. Capacitation of LGUs (agriculture extension workers and counterparts) in the use of GIS software.	At least 1 training per year, 2 participants per MAGRO	150,000	150,000	150,000	150,000	150,000	150,000	MOOE (Travel, training expenses, Professional fees)	Training design preparation (3-day training)	900,000	DA, BSWM, PLGU
9. Piloting of partial traceability in the centralized information platform (linked to in 2.8.) by uploading available information for the Province of Davao de Oro in a website, linked to	1 webpage in the centralized information platform for pilot traceability, linked to other more popular platforms	20,000	20,000	20,000	20,000	20,000	20,000	Personnel services and website	Data processing, uploading	120,000	PLGU, PAGRO

Activity	Target	2025	2026	2027	2028	2029	2030	Cost category	Sub-activities	Cost (PHP)	Funding sources/ cost-sharing agencies
social media, radio, and other effective platforms.											
10. Gradual use of digital platforms such as kobo collect, open street map, existing DDO digital platform, and other apps relevant to cacao agribusiness, such as e-commerce, digital marketing, and farm management which can also increase the interest of youth in cacao agribusiness, and to make traceability easier in the future. (linked with 1.3.2., 1.3.3., and 4.1.5.)	Digital platforms integrated in training and training materials of 10 institutions 1 digital pest and disease monitoring system developed to be updated every 2 years							MOOE (Food expenses, printing & binding)	Consultations	Inputted in 1.3.2., 1.3.3., and 4.1.5.)	DA-ATI
11. Integration into the digital farmers program of DA-ATI	1 TOT from ATI, 2 representatives from each municipality	400,000								400,000	DA-ATI, PLGU
	Integrated in the Collaborative Provincial Agricultural and Fisheries Extension Program	20,000								20,000	PLGU
	1 training of farmers/municipality/year	1,650,000	1,650,000	1,650,000	1,650,000	1,650,000	1,650,000			9,900,000	DA, PLGU, MLGU, FA
Intervention 4.2. Provide market incentives such as higher market price or better access to current market for 'safe' or premium higher quality cacao beans.											
1. Stocktaking of buyer's information, and the standards and protocols required by each buyer, and uploading them in the centralized information platform.	1 list of buyers' information, standards and protocols;	Included 4.2.11						MOOE (TEV)	Data gathering	Included 4.2.11	PAGRO, Provincial Cacao Council
	Uploaded standards and protocols in the centralized information platform									Inputted in 2.8.4.	
2. Development of an incentive mechanism for members of organizations	1 incentive mechanism developed per cluster (updated every 3 years)	25,000	5,000	5,000	5,000	5,000	5,000	MOOE (representation)	Consultation with clusters and FCAs,	50,000	Cluster / FCA, PLGU

Activity	Target	2025	2026	2027	2028	2029	2030	Cost category	Sub-activities	Cost (PHP)	Funding sources/ cost-sharing agencies
to sell cacao beans to the organization									writeshop finalization		
3. Facilitation of farmers' adoption of standards and protocols by close mentoring and monitoring (linked to FCAs in 2.4.2.)	100% of new farmers							MOOE (P7rofessional fees)	Technical assistance	Inputted in 3.2.1.	DA, FCA, PLGU
4. Linking farmers/cluster/FCA aiming for quality improvements to accessible loans and grants (in line with 2.1).	100% cluster or FCA/ year linked	20,000	20,000	20,000	20,000	20,000	20,000	Representation exp., traveling exp.	Technical assistance	120,000	ACPC, Banks, coops and other
5. Facilitation of the creation of commercial partnership agreements between buyers and farmers with appropriate incentives for good quality beans.	Create 2 commercial partnership agreements between buyers and farmers/farmer groups every year	60,000	60,000	60,000	60,000	60,000	60,000	MOOE (Representation, TEV)	Meeting, technical assistance	360,000	DTI, private sector, NGOs
6. Sharing success stories of differentiated pricing structures for quality beans to encourage buyers to adopt the models.	1 farmer's success story per year							MOOE (representation, TEV)	Meetings, interview, Post processing, printing/ uploading	Inputted in 4.1.	DTI, DA
7. Involvement of organizations with differentiated pricing structures in the capacity building activities for cacao farm production and processing (link to training events and sharing sessions)	1 new organization per year adopted differentiated pricing									Inputted in capacity building costs in Strategy 3	DTI, DA

Strategy 5: Incentivizing ecosystem services generated at farm- and landscape scale

Activity	Target	2025	2026	2027	2028	2029	2030	Cost category	Sub-activities	Cost (PHP)	Funding sources/ cost-sharing agencies
Intervention 5.1. Reward mechanism for farmers adopting sustainable cacao farming practices which contribute to generating ecosystem services such as carbon storage and biodiversity at farm or larger scale.											
1. Conduct of "search for best/outstanding farmers" adopting sustainable cacao farming practices (linked to 3.2.3)	1 recognition event per year 11 farmer awardees per year		108,000	108,000	108,000	108,000	108,000	MOOE (Representation), donations	Meeting, evaluation, awarding	540,000	DA, PLGU
2. Provision of incentives for cacao farmers who are Participatory Guarantee System (PGS) certified.	2 farmers/ year incentivized			100,000	100,000	100,000	100,000	MOOE, Donations	Awarding PHP 50,000 to farmer	400,000	DA, PLGU
3. Development of mechanisms to use a portion of the "Environmental Users Fee" to support cacao farmers who are contributing to ecosystem services such as soil and water conservation and carbon sequestration	At least 2 mechanisms developed		41,667	125,000	125,000	125,000	83,333	MOOE (Representation, Donations	2 meetings with 11 LGUs	500,000	DA, PLGU, MLGU
Intervention 5.2. Strengthen collaboration with research institutions for quantifying water regulation, carbon sequestration, and pest control through more sustainable cacao farming practices											
1. Establishment of formal partnerships with research institutions through MOUs (SUCs and municipal LGU & provincial LGU) to outline mutual goals and responsibilities (linked with Strategy 6 and Activity 1.3.1.)	At least 2 formal partnerships established	100,000						MOOE (Representation)	Meetings	100,000	DA, PLGU-PAGRO, NGO
2. Strengthening collaboration to apply for grants and funding from national funds and international sources dedicated to cacao and environmental research (linked with Strategy 6 and Activity 5.2.1.)	At least 1 proposal submitted for grant application		200,000					MOOE (Representation)	Meeting and coordination	200,000	DA, PLGU-PAGRO, NGOs, Academe, private sector
Intervention 5.3. Identify opportunities for e.g. carbon or biodiversity credit both from potential investors within and outside the county.											
1. Conduct comprehensive market research to understand the current landscape of carbon and biodiversity credits	1 cacao market research developed		1,000,000					MOOE (Representation)	Meetings, Partnership with research institutions like DDOSC for the conduct of research	1,000,000	DA, Private agencies, DOST, academe, PLGU-PAGRO, SFITAL
2. Development of partnerships with NGOs and/or Corporates committed to sustainability and conservation	Partnership developed with at least 1 NGO and/or 1 private agency per year	16666.667	16667	16666.667				MOOE (Representation)	Meetings	50,000	DA, NGOs, PLGU, Private agency

Strategy 6: Strengthening institutions and local policy environment

Activity	Target	2025	2026	2027	2028	2029	2030	Cost category	Sub-activities	Cost (PHP)	Funding sources/ cost-sharing agencies
Intervention 6.1. Formalization of cacao governing institutions in support of the local government unit											
1. Strengthening of the Provincial/Municipal Cacao Council for Davao de Oro to serve as coordinating body for cacao development through a local ordinance adopting/recognizing the Provincial Cacao Council	1 SP resolution	40,000	40,000	40,000	40,000	40,000	40,000	MOOE (food expenses)	Meetings x 4/year	240,000	PAGRO, Provincial Cacao Council
2. Establishment of the Municipal Cacao Council	1 SB resolution								Meeting, consultation	Inputted in other items	PAGRO, Provincial Cacao Council
3. Creation of an Executive Order for sustainable cacao development in Province of Davao de Oro (and per Municipality), with provision on the creation of a Provincial Technical Working Group, information sharing for traceability,	1 Provincial Executive Order;							MOOE (food expenses)	Coordination meeting with all members of TWG	360,000	PAGRO
	EO adopted at the municipal level										
	2 coordinating meetings per year	60,000	60,000	60,000	60,000	60,000	60,000				
Intervention 6.2. Craft supportive policies for the strategies and interventions in the cacao roadmap – all these policies shall be stipulated in the EO of the province/Municipality											
1. Adoption of the plans for identified cacao expansion, rejuvenation, and rehabilitation areas for the whole Province.	1 resolution adopted in the province/municipality		30,000					Food and venue	Meeting	30,000	DTI-RAPID
2. Acknowledgment of the established learning farm/WOW farms in municipalities and integration into annual planning and budget, monitoring the site.	1 resolution crafted and approved for each MLGU		60,000	60,000				Food and venue	Meeting	120,000	DTI-RAPID, ATI
3. Adoption of the comprehensive training manuals on cacao agroforestry practices, postharvest protocols, and monitoring form for sustainability through a local ordinance (linked with 2.4.7., 2.5.1., and 3.1.5.)	At least 1 local ordinance							MOOE (food expenses)	Consultation and meetings	Inputted in 6.1.	DA, ATI
4. Creation of a resolution authorizing the Provincial Cacao Council to give certification to legitimate cacao growers and buyers in the province	1 resolution crafted and approved							Food and venue	Meeting	Inputted in 6.1.	DTI-RAPID, PAGRO

Activity	Target	2025	2026	2027	2028	2029	2030	Cost category	Sub-activities	Cost (PHP)	Funding sources/ cost-sharing agencies
5. Creation of policy for the regulation of cutting of cacao trees	1 policy formulated							MOOE (food expenses)	Establish regulations, consultation, prepare & develop guidelines, approval	Inputted in 6.1.	DTI-RAPID, PAGRO
Intervention 6.3. Adoption of farm consolidation and clustering approach in cacao development.											
1. Conduct of information sessions on the benefits of clustering and collective action to cacao producers, buyers, and processors.	1 info session on cacao value chain per cluster conducted per year	120,000	120,000	120,000	120,000	120,000	120,000	MOOE (food expenses, Traveling expenses)	Briefing/ orientation	720,000	DA, PAGRO
2. Facilitation in organizing and strengthening farmer groups. (Include organizational development)	At least 2 FCAs organized and strengthened per year;	500,000	500,000	500,000	500,000	500,000	500,000	MOOE (food expenses, fees, professional fee)	Trainings	3,000,000	DA, FCA, PAGRO CDD
	4 meetings a year for updating										
	2 Capacity building per year)										
3. Facilitation in the formalization of farmers' association into cooperatives through registration to Cooperative Development Authority.	At least 1 FAs assisted per year	100,000	100,000	100,000	100,000	100,000	100,000	MOOE (food expenses, fees and registrations)	Pre-registration seminars, Registration assistance	600,000	CDA, FCA

Appendix 7. Activities, targets, and time plan

Strategy 1: Sustainable land use allocation for cacao production

Activity	Target	2025	2026	2027	2028	2029	2030	Lead agency	Partner agency/ies	Funding sources/ cost-sharing agencies
Intervention 1.1. Designate main cacao production areas and identify possible areas for expansion, rehabilitation, and rejuvenation of cacao farms.										
1. Stocktaking of available cacao suitability maps (e.g., SARAI, SFITAL, BSWM), and adopt the suitability maps for the province	1 provincial cacao suitability map adopted by province[20]		1					PAGRO	BSWM, MLGUs, Provincial Cacao TWG	PAGRO, MLGUs, BSWM
1.1. Identify parameters of suitability, especially the socio-economic aspects	1 set of parameters of suitability identified with local stakeholders	1								
2. Stocktaking of existing information on cacao producing areas and their conditions	1 provincial cacao commodity profile prepared	1	Update (U)	U	U	U	U	PAGRO	MLGUs (conducts data gathering of primary and secondary information), Provincial Cacao TWG (expertise), private (KFI, LADRIERE, AEC MPC), UP Min, DENR, NCIP, PAGRO-BAEW	DA, PAGRO, MLGUs, PSA, DTI, DENR, NCIP
3. Harmonize the existing cacao-related maps and produce an integrated land use map for cacao development, by involving key stakeholders including provincial/local government units, agricultural experts, cacao farmers, community leaders, and environmental groups.	1 integrated land use map for cacao developed and adopted for the province		1					PAGRO	PPDO, PENRO, Provincial Cacao TWG	PLGU DDO, DA, PPDO, PENRO
4. Identification of suitable barangays for cacao expansion based on biophysical conditions, to include suitability with existing crops species	Map of existing crop species	1			U			PAGRO	MLGU PENRO, Provincial Cacao TWG. NCIP	PAGRO, MLGUs, DA, PENRO, DTI-RAPID, DAR, NCIP
	1 List of suitable areas for expansion	1			U					
5. Identification of cacao clusters for cacao production.	10 cacao clusters identified and monitored	3	5	2				PAGRO	MLGU, FCA, DA (RSBSA), BAEW, UP Min, DDOSC	DA, PAGRO (BAEW), MLGU, NGOs, DTI-RAPID,
Intervention 1.2. Develop recommended models of cacao farms and suitable crop components to reconcile economic and ecological benefits.										

[20] In the time plan, the number 1 below 2026 means that, the target is to create 1 provincial cacao suitability map and it should be available in 2026. This kind of interpretation should apply to other activities and targets specified across years.

Activity	Target	2025	2026	2027	2028	2029	2030	Lead agency	Partner agency/ies	Funding sources/ cost-sharing agencies
1. Identification of existing cacao farms that qualify as Model Farms which can serve as training centers for local farmers.	1 set of qualifying parameters for a model farm established	1						PAGRO	MLGUs, FCAs and Provincial Cacao TWG, UP Min, DDOSC	DA, ATI, TESDA, PAGRO, MLGUs
	11 potential model farms in a strategic location identified		3	2	2	2	2			
2. Mobilize resources for the establishment of learning farms through co-investment schemes by collaborating with agricultural institutions, extension services, and industry experts in 11 municipalities.	1 collaboration activity		1					PAGRO	DTI, MLGU, individual agencies related to the model farm	DA, ATI, TESDA, PAGRO, DTI
	At least 3 co-investment schemes developed.		3							
2.1. Facilitation in the accreditation of the learning farms as ATI Learning Site for Agriculture and as TESDA Farm School.	At least 1 learning farm/farm school accredited per year		1	1	1			PAGRO	DA, ATI, TESDA, MLGUs, FCAs	DA, ATI, TESDA, PAGRO, MLGUs, FCA
3. Establishment of accredited learning farms in each municipality	At least 3 learning farms established		1	1	1			MAGRO	FCAs, DA, ATI, TESDA, PAGRO, Academe, DTI, Private Sector	DA, ATI, PCA, TESDA, DTI, DAR, PAGRO, DOLE through PESO-LGU, MLGUs, FCA, PhilMech, and private sector identified in 1.2.2.
4. Promotion of the model farm and its activities to a broader audience	At least 2 farm tours per year		2	2	2	2		PAGRO, MAGRO, private agency (whoever is appropriate)	PAGRO, PLGU and MLGU-Tourism Office, FCAs, Private Agencies	DA, PLGU-IPRD, PAGRO, ATI, PLGU and MLGU-Tourism Office
5. Regular monitoring of the farm's performance, including productivity and the effectiveness of demonstrated practices using the form created under 4.1.2.	Filled out farm record, monitored quarterly per farm		4	4	4	4	4	MLGU	PAGRO (BAEW), private agencies	PAGRO, MLGU
Intervention 1.3. Assess economic and ecological impacts of several land use interventions at municipality or province scale and conduct trade-off analysis to help understand associated risk and benefits for decision making.										
1. Identify lead agencies (linked with Strategy 6) for collaborating with research and development agencies to gather and analyze inclusive data required for impact assessment and trade-off analysis.	At least 1 multistakeholder collaboration activity conducted		1					PAGRO - Research	Provincial Cacao TWG, DNAS, MonCAST, USEP, Kolehiyo ng Pantukan, Philippine Cacao Industry Council, private agencies	DA- Research, DDOSC, UP Min, NGOs, PLGU
2. Conduct of ecological assessment	1 Ecological Assessment conducted		1					PAGRO - Research	Provincial Cacao TWG, DENR (CENRO, PENRO), MLGU (MENRO, MAGRO, MPDO), DNAS, MonCAST, USEP, Kolehiyo ng Pantukan,	DA- Research, DDOSC, UP Min, NGOs, PLGU

Activity	Target	2025	2026	2027	2028	2029	2030	Lead agency	Partner agency/ies	Funding sources/ cost-sharing agencies
									Philippine Cacao Industry Council, private agencies	
3. Conduct a series of workshops, FGDs, and public consultations for participatory planning based on ecological assessments.	At least 2 participatory planning events conducted		2					PAGRO - Research	Provincial Cacao TWG, DENR (CENRO, PENRO), MLGU (MENRO, MAGRO, MPDO), DNAS, MonCAST, USEP, Kolehiyo ng Pantukan, Philippine Cacao Industry Council, private agencies	DA- Research, DDOSC, UP Min, NGOs, PLGU

Strategy 2: Improving access of the cacao farming community to livelihood capitals

Activity	Target	2025	2026	2027	2028	2029	2030	Lead agency	Partner agency/ ies	Funding sources/ cost-sharing agencies
Intervention 2.1. Assist cacao farming community to better access crop insurance.										
1. Stocktaking existing crop insurance programs in the province.	1 list of insurance providers	1		U		U		PAGRO	MLGU, PCIC, CLIMBS / Producers Bank / Consolidated Bank	PCIC
2. Facilitation of access to various crop insurance programs through information sessions, radio, newsletters, online communication platforms such as social media and a centralized information platform.	At least 6,000 farmers	500	1100	1100	1100	1100	1100	PAGRO	MLGU, PCIC, PICTO	MLGU, PCIC, PAGRO,
3. Integration of crop insurance topic in training, including how to access insurance.	11 trainings in the first year, then 22 trainings on the following year with crop insurance integration	11	22	22	22	22	22	PAGRO- CDD	PCIC, DTI Rapid, MLGU	PCIC, DTI-RAPID and PAGRO, MLGU
Intervention 2.2. Improve access to farm inputs to include quality planting materials (multiple cacao varieties, grafted seedlings, etc.), farm tools, by e.g. strengthening collaboration with national government agencies, academe, non-government organizations, private enterprises, and farmer organization.										
1. Stocktaking of the private agencies, academe, non-government and government organizations who can potentially provide farm inputs such as good quality planting materials, farm tools, etc.	1 Stocktaking activity and yearly updating	1	1	1	1	1	1	PAGRO	PCIC, MLGU, BPI, DTI-RAPID, DA, PCA, DENR,	DA, PAGRO
2. Develop partnership agreements for the provision of quality planting materials including multiple clones that are climate-	At least 3 partnership agreements developed	1	1	1				PAGRO	FCA, DA- Research / Academe, NGO, Provincial	DA- Research / Academe, NGO

Activity	Target	2025	2026	2027	2028	2029	2030	Lead agency	Partner agency/ ies	Funding sources/ cost-sharing agencies
resilient and disease-tolerant, farm tools, etc.									Cacao Council and TWG, DENR., BPI	
3. Develop potential and adopt existing sustainable modalities for providing farm inputs.	2 modalities developed	1		1				PAGRO	MLGU, DA, PCA -CFIDP	DA
	Each modality adopted in 3 municipalities the province		3		3					
4. Stocktaking of existing nursery operators and identify aspiring farmer organizations to become nursery operators	1 list of nursery operators to be updated every 2 years	1	1	1	1	1	1	PAGRO	DA-BPI, KFI, DENR	DA-BPI
5. Conduct of capacity-building activities for operators and aspiring farmer organizations on cacao nursery management practices and nursery accreditation to BPI	1 training/year	1	1	1	1	1	1	PAGRO	FCAs, MLGU, DA- BPI, ATI	DA- BPI, FCAs
6. Facilitation of registration of new clones to BPI-National Seed Quality Control Service	2 new clones registered to BPI			1			1	NGAs	DA- BPI, Academe, NGAs, Private sector, KFI	DA-BPI, Academe, NGAs
7. Provision of support to farmer organizations and individual farmers for community-based nursery establishment, enabling them to produce high-quality planting materials and multiple cacao varieties & clones.	3 community-based nurseries established			1		1	1	DA, NGOs, FCAs	NGAs	DA, NGOs, FCAs, PAGRO
8. Facilitate the establishment of community-based organic fertilizer plant	1 community-based fertilizer plant established per year		1	1	1	1	1	FCA	BSWM	TESDA
9. Facilitate the establishment of village-type biological control agents for pests and disease.	2 village-type biological control agents created		1	1				FCA	DA-RCPC	DA
10.Upgrading of LGU operated plant nurseries and establishment of clonal garden in compliance with BPI accreditation.	4 operated nurseries by PLGU and MLGU			1	1	1	1	MLGU	PAGRO, DA-BPI	DA, LGUs
Intervention 2.3. Equip farmer organizations to engage in fermentation, drying, and other postharvest operations in cacao production for increased bean quality.										
1. Stocktaking of farmer organizations and clusters who can engage in cacao consolidation and processing	5 clusters per year	5	5	5	5	5	5	PAGRO	MLGU, NGAs, DENR	DA and MLGU
2. Provision of comprehensive training manuals, guides, and visual aids that explain the criteria and standards for bean classification and grading, and possibly upload these in a centralized information system, linked to more accessible communication platforms such as social media, radio, etc.	1 comprehensive manual to be updated every 3 years		1		1			PAGRO	PLGU, Provincial Information and Communication Technology Office, Cacao Council, TESDA,	NGO, PLGU, ICRAF
	2 FCAs or cluster per year	2	2	2	2	2	2	PAGRO	FCAs, MLGU	

Activity	Target	2025	2026	2027	2028	2029	2030	Lead agency	Partner agency/ ies	Funding sources/ cost-sharing agencies
3. Provision of training for farmer organizations and facility operators on the best practices for cacao processing, including drying and fermentation techniques.	1 training for facility operators per year		1	1	1	1	1			ATI, DOST, DA, DTI, DAR, TESDA, NGOs
4. Enhancement of existing cacao postharvest and processing facilities by supporting farmer organizations and cooperatives in acquiring product quality standard certifications (e.g. with FDA).	3 FCAs		1		1		1	PAGRO	FCAs, DENR, LADRIERE	DA, DTI, DOST
5. Provision of improved postharvest and processing facilities (e.g., fermentation boxes, dryers, etc.) to selected farmer organizations and cooperatives	3 cluster/ FCAs			1	1	1		MLGU	PAGRO, NGAs, DENR	DOST, DA, DA-PhilMech, DOLE, DTI
6. Conduct of training focused on bean classification and grading techniques, with hands-on activity for farmers.	2 trainings per year	2	2	2	2	2	2	PAGRO	FCAs, MLGU, LADRIERE, KFI	DA, DTI, ATI
Intervention 2.4. Establish more consolidation points in strategic locations to improve market access, strengthening collaboration with national government agencies, academe, the private sector, Provincial Cacao Council, and cooperatives										
1. Conduct of training workshops on topics such as supply chain management, logistics, quality control, and financial management.	5 trainings conducted		1	1	1	1	1	MLGU	FCAs, NGAs, UP-Mindanao, Academe	DA, DTI, ATI
2. Facilitation of farmers and farmer organizations to engage in clustering and venture into consolidation to streamline the supply chain and improve efficiency.	6 clusters (1 cluster per year)		1	1	1	1	2	MLGUs	FCAs, Cacao Council, DENR	DA, PAGRO, MLGUs, FCAs
3. Endorsement of the potential new clusters to F2C2 program of the Department of Agriculture.	6 clusters (1 cluster per year)	1	1	1	1	1	1	MLGU	Provincial Cacao Council, FCAs	PAGRO, MLGUs, DA
4. Assessment of each farmer and organization's capacity to function as a consolidation hub based on factors such as infrastructure, management skills, financial health, and membership size.	3 FCAs assessed		1	1	1			MLGU	PAGRO, DENR	DA, DTI
5. Provision of support to organizations in upgrading or acquiring necessary infrastructure and equipment, such as warehouses, processing facilities, and transportation.	3 FCAs supported			1	1	1		MLGU	PAGRO, FCAs, DENR, DAR, DSWD, DILG	DA, DOST, DTI, DOLE, PRDP
6. Creation and adoption Standard Operating Procedures for consolidation hub operations, including procedures for collection, sorting, storage, and distribution of cacao.	1 SOP updated every 2years		1		1		1	PAGRO	Provincial Cacao Council, FCAs, DENR, DAR, DSWD, DILG	MLGU, PAGRO, FCAs
	3 FCAs newly adopting the SOP			1	1	1				

Activity	Target	2025	2026	2027	2028	2029	2030	Lead agency	Partner agency/ ies	Funding sources/ cost-sharing agencies
7. Regular monitoring (once a month) of the performance of consolidation hubs, including efficiency in operations, financial performance, and impact on farmers	3 consolidation hubs; Once a month monitoring		3	3	3	3	3	MLGU	PAGRO, FCAs, Provincial Cacao Council, DENR	PAGRO, MLGUs
Intervention 2.5. Improve entrepreneurial skills of cacao farming community including women and youth to increase their ability in finding new market opportunities, including product development.										
1. Provision of assistance to farmers in obtaining certifications to access premium markets.	10 individual farmers, 1 FCAs per year	11	11	11	11	11	11	PAGRO	MLGU, Cacao Council, FCAs, NGAs	DA, PAGRO, MLGU, FCAs
2. Integration of gender sensitivity, financial literacy, and entrepreneurship in cacao-related trainings.	2 training sessions per year	2	2	2	2	2	2	PAGRO	FCAs, ATI, TESDA, DENR, CDA	DTI, DA- AMAD, DOST
3. Conduct training on product development and promotion (packaging, labeling, etc.)	2 training sessions per year	2	2	2	2	2	2	PAGRO	FCAs, DTI, DOST, NGAs	DTI, DA- AMAD, DOST
4. Conduct of mentorship activities by linking cacao farming community with experienced entrepreneurs	5 mentorship activities per year	5	5	5	5	5	5	PAGRO	DTI, MLGU, Cacao Council, NGAs	DTI, DA, DOST
5. Facilitation of product investment and promotion through trade fairs, business matching activities, and market brokering sessions where farmers/farmer organizations/MSMEs.	5 investment activities per year	5	5	5	5	5	5	PLGU-Investment	DTI, DA- AMAD, TESDA, Chamber of Commerce, NGAs, MINDANAO Development Authority	DTI, DA-AMAD, PLGU-Investment
6. Integration of enterprise information into the centralized information system linked to more accessible knowledge platforms to be developed in 4.3.	1- integrated enterprise information system, updated regularly	1	1	1	1	1	1	PAGRO	PAGRO- PICTO, DTI, DA-AMAD	ICRAF, NGOS
Intervention 2.7. Improving and establishing farm-to-market roads										
1. Conduct of an inventory of road networks that need to be improved based on the location of existing cacao farms and plans for expansion and development.	Develop 1 inventory for road networks that need to be improved for cacao expansion; Update the inventory every year	1	1	1	1	1	1	PPDO	MLGU	PPDO, DPWH, DA
2. Integration of cacao development into the FMR Network Plan of Davao de Oro.	Cacao development integrated into FMRNP (1 plan to be updated every 3 years)	1		1		1		PAGRO,	PPDO, DPWH	DA- RAED, PAGRO
3. Development of linkage with the national agencies for funding access for FMR development	1 collab. activity per year	1	1	1	1	1	1	PAGRO	PPDO, PEO, DPWH	DA-RAED, DA- PRDP, DPWH

Strategy 3: Increasing productivity and income diversification of cacao farms

Activity	Target	2025	2026	2027	2028	2029	2030	Lead agency	Partner agency/ ies	Funding sources/ cost-sharing agencies
Intervention 3.1. Promote sustainable cacao farming practices through extension services, integration of cacao into education curriculum and provision of training manuals.										
1. Stocktaking of institutions and rural development projects with capacity building activities and uploading the information in the centralized information platform.	1 list of research and extension institutions to be updated annually;	1	U	U	U	U	U	PLGU-PAGRO	Provincial Cacao TWG, PICTO, ICRAF, DDOSC, ATI	DA, DTI, PAGRO, PLGU, ICRAF
	1 list of research needs in the province to be updated annually	1	U	U	U	U	U			
	Upload at least 5 knowledge products/ year	5	5	5	5	5	5			
2. Development of comprehensive training manuals and guides on cacao agroforestry practices tailored to different levels of farmers' expertise and educational backgrounds	1 comprehensive training manual and guide developed (updated every 3 years)	1		1		1		PLGU-PAGRO,	Academe, ATI, TESDA, CACAO COUNCIL, NGAs	DA, DTI, PLGU, NGO, academe, Private, ATI, TESDA
3. Establishment of partnership agreement for capacity building events with private sector, high schools, state colleges, NGOs, rural development projects, and extension institutions in the conduct of capacity building events.	Established 2 partnerships per year	2	2	2	2	2	2	PLGU-PAGRO	DTI, TESDA, DENR, NGAs	DA, DOST, academe, PLGU
4. Establishment of partnerships to integrate agroforestry and agroecology topics into curriculum of High Schools and State Universities and Colleges.	Partnership with 2 high schools and 2 SUCs/year to integrate agroforestry and agroecology topics into their curriculum.			1				PLGU-PAGRO	DTI, academe, PCIC	DA, DTI, PLGU
5. Distribution of printed learning materials to farmers	Distribute 500 copies /year printed learning materials to farmers		500	500	500	500	500	PLGU-PAGRO	Provincial Cacao TWG, Academe	DA, DTI, PLGU, ATI
6. Application of sustainable farming practices through Good Agricultural Practices and crop diversification in cacao expansion, rehabilitation and rejuvenation areas, and in demonstration farms.	10 cacao farms newly adopting Good Agricultural Practices;	10	10	10	10	10	10	PLGU-PAGRO	DAR, PCA, DA, DTI-RAPID	DA, DTI-RAPID, DAR, PCA, academe, NGO, private sec
	2 co-investment plans for rejuvenation and rehabilitation per year to be updated every 2 years	2		2		2		PAGRO	DTI_RAPID, PRDP, PCIA, PCA, Academe	DTI_RAPID, PRDP, PCIA, PCA
7. Provision of incentive programs such as grants, scholarships, and recognition awards to encourage the participation of women and youth in cacao farming	Conduct 1 recognition awarding for cacao farmers with three categorie4s (Biggest pods, biggest, biggest beans, best quality);		1	1	1	1	1	PLGU-PAGRO	PAGRO, TESDA, ATI, DOST	DA, PLGU-PAGRO
	10 beneficiaries/year of scholarship to children of		10	10	10	10	10			

Activity	Target	2025	2026	2027	2028	2029	2030	Lead agency	Partner agency/ ies	Funding sources/ cost-sharing agencies
	cacao farmers for taking agriculture-related courses									
Intervention 3.2. Improve extension service and mentorship program for cacao farming community, including women and youth										
1. Mobilization of resources for staffing of agricultural extension workers, including the provision of incentives for barangay extension workers and Cacao Mentors involved in cacao development	Provision of Honorarium to 10 Cacao mentors/year		10	10	10	10	10	PLGU-PAGRO	FCA, NGAs	DA, FCAs, PLGU, Private sector, NGOs
	12 cacao focal person designated in the Provincial (1) and Municipal LGU (11)		12							
2. Capacitation of farmer organizations and barangay extension workers, and Cacao Mentors (Farmer/Coops/and Associations) to provide on-site support and advisory services to cacao farmers.	11 trainings per year	11	11	11	11	11	11	PLGU-PAGRO	ATI, MLGU	DA, DTI, PLGU, Private sector, NGOs
3. Implementation of recognition programs or awards and incentive programs for exceptional agricultural extension workers	1 recognition awarding AEWs;		1	1	1	1	1	PAGRO	ATI, MLGU	PLGU, DA
	13 AEWs submitted			13	13	13	13			

Strategy 4: Sustainable improvement of supply and market value chain

Activity	Target	2025	2026	2027	2028	2029	2030	Lead agency	Partner agency/ ies	Funding sources/ cost-sharing agencies
Intervention 4.1. Improve governance, connectivity, fairness, and transparency of supply and market value chain by strengthening collaboration between public and private sector to include Cacao Industry Council.										
1. Mapping of stakeholders in Davao de Oro (per LGU) by supply chain network (input providers, farmers and affiliations, traders, consolidator, processor) with contact details, description of operation, and geographic location	1 complete list of cacao supply chain actor mapped and updated annually, including farmers registry	1	U	U	U	U	U	PAGRO/Cacao de Oro Provincial Council	DTI-RAPID, DA, MLGU, BLGU, Municipal Cacao Council to assist in updating later on, PCA (related to their rehab project), Private sector and NGOs, DENR (E-NGP), DSWD, DOLE, DAR, DOST, TESDA, DILG, MinDA, MEDA	PAGRO/Cacao de Oro Provincial Council
2. Stocktaking of available information on cacao production and supply and market value chain from stakeholders identified in 4.1.1. (specify area, production volume, etc.)	1 inventory of available information, to be Updated yearly	1	U	U	U	U	U	PAGRO	MLGU. BLGU, Municipal Cacao Council to assist in updating later on, PCA (related to their rehab project), Private sector and NGOs, DENR (E-NGP), DSWD, DOLE, DAR, DOST, TESDA, DILG, MinDA, MEDA	PAGRO

Activity	Target	2025	2026	2027	2028	2029	2030	Lead agency	Partner agency/ ies	Funding sources/ cost-sharing agencies
3. Collection of available information from cacao stakeholders in Davao de Oro (e.g., mass of beans collected by the buyers per barangay per week by form of beans, mass of beans processed by cooperatives, etc.)	100% of private companies that supply information	50%	50%	U	U	U	U	PAGRO/Cacao de Oro Provincial Council	DTI-RAPID, DA, MLGU, BLGU, Municipal Cacao Council, PCA (related to their rehab project), Private sector and NGOs, DENR (E-NGP), DSWD, DOLE, DAR, DOST, TESDA, DILG, MinDA, MEDA	DA, DTI- RAPID
	100% FCAs that supply information	50%	50%	U	U	U	U			
	Barangays. Agricultural Extension Workers (AEWs) institutionalized to gather datal, and disseminate information to cacao farming communities	1								
4. Collaboration with agencies that can monitor and handle the centralized information system (e.g., Provincial LGU, Provincial/Municipal Cacao Council, Academe, DA)	1 collab activity		1					PAGRO	Provincial Cacao Council	ICRAF, PCA (CFIDP)
5. Working with agricultural extension services, cooperatives, and NGOs to promote the platform and integrate it into existing support structures.	Platform shared in 10 extension activities		2	2	2	2	2	PAGRO	IPRD, ICRAF	IPRD, ICRAF
6. Implementation of the digital centralized information platform on cacao production, post-production, market opportunities, training programs, and climate information. Ensuring that this platform is farmer user-friendly and available in the local dialect.	1 centralized digital platform developed;	1	U	U	U	U	U	PAGRO	ICRAF, Cacao Council	ICRAF, PAGRO
	At least 2 capacitation activities for target users	1								
	Weekly post in any digital platform	52	52	52	52	52	52			
7. Provision of high-end equipment such as laptop, drones, Cellphones, Tablets, etc. to LGU workers.	At least 2 units of laptop per office for PAGRO and MAGROs;	8	8	8				PAGRO	DA	DA, PLGU, MLGU
	At least 1 unit of smartphone per MLGU	12								
	At least 1 unit of motorcycle per MLGU	4	4	4						
	At least 2 units of drones for PAGRO		1			1				
8. Capacitation of LGUs (agriculture extension workers and counterparts) in the use of GIS software.	At least 1 training per year, 2 participants per MAGRO		1	1	1	1	1	PAGRO	DA-RAED, MLGU, DHSUD	DA, BSWM, PLGU
9. Piloting partial traceability in the centralized information platform (linked to in 2.8.) by uploading available information for the Province of Davao de	1 webpage in the centralized information platform for pilot traceability, linked to	1	U	U	U	U	U	PAGRO	PLGU-PICTO	PLGU, PAGRO

Activity	Target	2025	2026	2027	2028	2029	2030	Lead agency	Partner agency/ ies	Funding sources/ cost-sharing agencies
Oro on a website, linked to social media, radio, and other effective platforms.	other more popular platforms									
10. Gradually use digital platforms such as kobo collect, open street map, existing DDO digital platform, and other apps relevant to cacao agribusiness, such as e-commerce, digital marketing, and farm management which can also increase the interest of youth in cacao agribusiness, and to make traceability easier in the future. (linked with 1.3.2., 1.3.3., and 4.1.5.)	Digital platforms integrated in training and training materials of 10 institutions	1	2	2	2	2	1	PAGRO	DA-ATI, PLGU-PICTO, MLGUs with functioning websites	DA-ATI
	1 digital pest and disease monitoring system developed to be updated every 2 years	1		1		1		SFITAL	DA-RCPC, academe, DA-RCPC	
11. Integration into the digital farmers program of DA-ATI	1 TOT from ATI, 2 representatives from each municipality	1						PAGRO/DA-ATI	Provincial Cacao Council	DA-ATI, PLGU
	Integrated in the Collaborative Provincial Agricultural and Fisheries Extension Program	1	U	U	U	U	U	PAGRO	DA-ATI, Provincial Cacao Council	PLGU
	1 training of farmers/municipality/year	11	11	11	11	11	11	MLGU	DA-ATI, DA RFO XI, BLGU, PLGU, FA	DA, PLGU, MLGU, FA
Intervention 4.2. Provide market incentives such as higher market price or better access to current market for 'safe' or premium higher quality cacao beans.										
1. Stocktaking of local and international buyer's information, and the standards and protocols being required by each buyer (linked to the Philippine National Standards) and uploading them in the centralized information platform.	1 list of buyers' information, standards and protocols;	1	U	U	U	U	U	PAGRO	ICRAF, Provincial Cacao Council, Private sector (especially buyers)	PAGRO, Provincial Cacao Council
	Uploaded standards and protocols in the centralized information platform									
2. Development of an incentive mechanism for members of organizations to sell cacao beans to the organization	1 incentive mechanism developed per cluster (updated every 3 years)	1	U	U	U	U	U	PAGRO, Provincial Cacao Council, Municipal Cacao Council	DTI-RAPID, Cluster / FCA	Cluster / FCA, PLGU
3. Facilitation of farmers' adoption of standards and protocols by close mentoring and monitoring (linked to FCAs in 4.2.1)	100% of new farmers	50%	100%	100%	100%	100%	100%	PLGU	Cacao Mentors, MLGU	DA, FCA, PLGU
4. Linking farmers/cluster/FCA aiming for quality improvements to accessible loans and grants (in line with 2.1).	100% cluster or FCA/ year linked	50%	100%	100%	100%	100%	100%	PLGU	ACPC/Davao de Oro Credit Coop, DOLE, DTI, DSWD, Other government or private agencies who offer loans and grants	ACPC, Banks, coops and other
5. Facilitation of the creation of commercial partnership agreements between buyers and farmers with	Create 2 commercial partnership between buyers and farmers/farmer groups every year	2	2	2	2	2	2	PAGRO	DTI, DTI-RAPID, private sector, NGOs, FCA, MLGU	DTI, private sector, NGOs

Activity	Target	2025	2026	2027	2028	2029	2030	Lead agency	Partner agency/ ies	Funding sources/ cost-sharing agencies
appropriate incentives for good quality beans.										
6. Sharing success stories of differentiated pricing structures for quality beans in online platforms and cacao-related events to encourage buyers to adopt the models.	1 farmer's success story per year	1	1	1	1	1	1	PAGRO, Provincial Cacao Council, Municipal Cacao Council	DTI, DA, FCAs	DTI, DA
7. Involving organizations with differentiated pricing structures in the capacity building activities for cacao farm production and processing (link to training events and sharing sessions)	1 new organization per year adopted differentiated pricing		1	1	1	1	1	PAGRO	DTI, DA, FCA	DTI, DA

Strategy 5: Incentivizing ecosystem services generated at farm- and landscape scale

Activity	Target	2025	2026	2027	2028	2029	2030	Lead agency	Partner agency/ ies	Funding sources/ cost-sharing agencies
Intervention 5.1. Reward mechanism for farmers adopting sustainable cacao farming practices which contribute to generating ecosystem services such as carbon storage and biodiversity at farm or larger scale.										
1. Conduct of "search for best/outstanding farmers" adopting sustainable cacao farming practices (linked to 3.2.3)	1 recognition event per year		1	1	1	1	1	PLGU-PAGRO	DA (F2C2)	DA, PLGU
	11 farmer awardees per year		11	11	11	11	11			
2. Provision of incentives for cacao farmers who are Participatory Guarantee System (PGS) certified.	2 farmers/ yr incentivized			2	2	2	2	PLGU-PAGRO	DA, private agencies	DA, PLGU
3. Development of mechanisms to use a portion of the "Environmental Users Fee" to support cacao farmers who are contributing to ecosystem services such as soil and water conservation and carbon sequestration	At least 2 mechanisms developed		1	3	3	3	2	PLGU-PAGRO	DENR, MLGU (MENRO, MPDO, MAGRO, Budget Office), PENRO LGU	DA, PLGU
Intervention 5.2. Strengthen collaboration with research institutions for quantifying water regulation, carbon sequestration, and pest control through more sustainable cacao farming practices										
1. Establishment of formal partnerships with research institutions through MOUs (SUCs and municipal LGU & provincial LGU) to outline mutual goals and responsibilities (linked with Strategy 6 and Activity 1.3.1.)	At least 2 formal partnerships established	2						PLGU- PAGRO	NGO, MLGU, FCAs, DNAS, MonCAST, USEP, DDOC, UP Min Kolehiyo ng Pantukan, Philippine Cacao Industry Council, private agencies	DA, PLGU-PAGRO, NGO
2. Strengthening collaboration to apply for grants and funding from national funds and international sources	At least 1 proposal submitted for grant application		1					PLGU-PAGRO	DA, Private sector	DA, PLGU-PAGRO, NGOs, Academe, private sector

Activity	Target	2025	2026	2027	2028	2029	2030	Lead agency	Partner agency/ ies	Funding sources/ cost-sharing agencies
dedicated to cacao and environmental research (linked with Strategy 6 and Activity 5.2.1.)										
Intervention 5.3. Identify opportunities for e.g. carbon or biodiversity credit both from potential investors within and outside the county.										
1. Conduct of a comprehensive market research to understand the current landscape of carbon and biodiversity credits	1 cacao market research developed		1					Academe (DDOSC, UP Min)	Academe, PLGU-PAGRO, Provincial Cacao TWG, DNAS, MonCAST, USEP, Kolehiyo ng Pantukan, Philippine Cacao Industry Council, private agencies, DENR	DA, Private agencies, DOST, ACADEME, PLGU-PAGRO, SFITAL
2. Development of partnerships with NGOs and/or Corporates committed to sustainability and conservation	Partnership developed with at least 1 NGO and/or 1 private agency per year	1	1	1				PAGRO (province), MAGRO (municipal)		DA, NGOs, PLGU, Private agency

Strategy 6: Strengthening institutions and local policy environment

Activity	Target	2025	2026	2027	2028	2029	2030	Lead agency	Partner agency/ ies	Funding sources/ cost-sharing agencies
Intervention 6.1. Formalization of cacao governing institutions in support of the local government unit										
1. Strengthening of the Provincial/Municipal Cacao Council for Davao de Oro to serve as coordinating body for cacao development through a local ordinance adopting/recognizing the Provincial Cacao Council (Establishment of Municipal Cacao Council)	1 SP resolution	1						PAGRO, Provincial Cacao Council	DTI-RAPID, RAFC, PAFC	PAGRO, Provincial Cacao Council
2. Establishment of the Municipal Cacao Council	1 SB resolution	11						PAGRO, Provincial Cacao Council	RAFC, PAFC	PAGRO, Provincial Cacao Council
3. Creation of an Executive Order for sustainable cacao development in Province of Davao de Oro (and per Municipality), with provision on the creation of a Provincial Technical Working Group, information sharing for traceability	1 Provincial Executive Order;	1						PAGRO	ICRAF, MLGUs, Provincial Cacao Council, RAFC, PAFC	PAGRO
	EO adopted at the municipal level	11								
	2 coordinating meetings per year	2	2	2	2	2	2			
Intervention 6.2. Craft supportive policies for the strategies and interventions in the cacao roadmap – all these policies shall be stipulated in the EO of the province/Municipality										
1. Adoption of the plans for identified cacao expansion, rejuvenation, and rehabilitation areas for the whole Province.	1 resolution adopted in the province/municipality		1					Provl Cacao Council,	PAFC, Provincial Cacao TWG	DTI-RAPID
2. Acknowledgment of the established learning farm/WOW farms in municipalities and integration into annual planning and budget, monitoring the site.	1 resolution crafted and approved for each MLGU	1	11					MLGU	Provl TWG, Provl Cacao Council, PAFC	DTI-RAPID, ATI
3. Adoption of the comprehensive training manuals on cacao agroforestry practices, postharvest protocols, and monitoring form for sustainability through a local ordinance (linked to 2.4.7., 2.5.1., and 3.1.5.)	At least 1 local ordinance		1					PAGRO	Provincial Cacao Council, Provincial TWG, MLGU	DA, ATI
4. Creation of a resolution authorizing the Provincial Cacao Council to give certification to legitimate cacao growers and buyers in the province	1 resolution crafted and approved	1						Provincial Cacao TWG	Provincial Cacao Council, DTI-RAPID, PAGRO, PAFC	DTI-RAPID, PAGRO
5. Creation of policy for the regulation of cutting of cacao trees	1 policy formulated			1				Provincial Cacao TWG	Provincial Cacao Council, DTI-RAPID, PAGRO, PAFC	DTI-RAPID, PAGRO
Intervention 6.3. Adoption of farm consolidation and clustering approach in cacao development.										
1. Conduct of information sessions on the benefits of clustering and collective action to cacao producers, buyers, and processors.	1 info session on cacao value chain per cluster conducted per year	1	1	1	1	1	1	PAGRO	DA-F2C2, Provincial Cacao Council	DA, PAGRO

Activity	Target	2025	2026	2027	2028	2029	2030	Lead agency	Partner agency/ ies	Funding sources/ cost-sharing agencies
2. Facilitation in organizing and strengthening farmer groups. (Include organizational development)	At least 2 FCAs organized and strengthened per year;	2	2	2	2	2	2	PAGRO-CDD	DA, FCA, Provincial Cacao Council	DA, FCA, PAGRO CDD
	4 meetings a year for updating	4	4	4	4	4	4			
	2 Capacity building per year)	2	2	2	2	2	2			
3. Facilitation in the formalization of farmers' association into cooperatives through registration to Cooperative Development Authority.	At least 1 FAs assisted per year	1	1	1	1	1	**1**	PAGRO- CDD	FCA, CDA	CDA, FCA