



💡 Cacaohibalo (*Cacao knowledge*)

Modelling sustainable cacao development through R-FALLOW



One of the key outputs of the Sustainable Farming in Tropical Asian Landscapes (SFITAL) project is a roadmap for sustainable cacao development in Davao de Oro. Since sustainable commodity development also related to other land uses over the landscape, World Agroforestry (ICRAF) applies a landscape approach and uses a spatially-explicit tool called R-FALLOW (Forest, Agroforestry, Low-value Land, or Waste?). R-FALLOW is used to assess economic-ecological trade-offs of various land-use scenarios. It takes into consideration local stakeholders—from decision makers to smallholder farmers—in terms of labor, allocation of land and finances for future land uses, aboveground carbon storage of the landscape, and possible land use changes in state-owned lands and forestlands.

This open-source digital modelling tool allows researchers, academics, policymakers, and other development actors to craft strategies towards commodity development that can bring optimal economic and ecological benefits.

To run this model, two types of inputs are needed: spatial in the form of maps and non-spatial in parameter values. Spatial inputs include maps that contain the boundary of the simulated area, the initial landcover type, soil fertility, boundary of forest protection area, slope, land suitability, distance to road, distance to river, distance to settlement, and distance to processing industry. As for the non-spatial inputs, the model requires socioeconomic, biophysical, and demographic inputs. The socioeconomic inputs include cost of establishment, labor required

for establishment, initial financial capital, fraction for secondary consumption, household consumption, returns to labor, returns to land, product price, and non-labor costs. The biophysical and demographic inputs are aboveground biomass, land cover time bound, yield, harvesting productivity, initial human population, annual population growth rate, fraction of productive farm labors, and annual working days.

As part of the roadmap development process, the SFITAL Project in the Philippines collected these spatial and non-spatial information and ran simulations using R-FALLOW. This helped identify initial scenarios of cacao development. These scenarios will continue to be enhanced throughout the next planning workshops, integrating input from local stakeholders, and will then be run again through R-FALLOW. These simulations are expected to guide local stakeholders in developing and finalizing the strategies and interventions to be included in the roadmap.

Additionally, the SFITAL Project also conducted a training on the use of this assessment tool last October 2023 to capacitate researchers, decision makers, and other decision makers in Davao de Oro on the use of this assessment tool, particularly for research and planning.

For more information on R-FALLOW, its user's manual is uploaded on Cacaomustahan.com, accessible through this [link](#).

SFITAL promotes agroecology for environment-friendly and climate resilient cacao production

One of the major issues of the cacao industry, not only in Davao de Oro but in the entire country, is the low productivity of trees, leading to low production. Many underlying factors contributing to this challenge were identified by national and local enablers. These include high incidence of pests and diseases, low soil fertility, high cost of inputs leading to non-management of most smallholder cacao farms, and its exposure to climate threats like drought and heat.

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SFITAL promotes agroecology for environment-friendly and climate resilient cacao production (cont.)



Mulching cacao trees with dried coconut husks help preserve soil moisture and enhancing soil organic matter

As part of its efforts to promote economically viable and environmentally sustainable cacao production, the SFITAL project in the Philippines promotes agroecological practices for climate resilient and environment-friendly cacao production.

Agroecological practices are agricultural practices integrated with ecological principles, making the cultivation of any crop safe for humans and the environment, and adaptable to changing climate conditions.

There are various agroecological practices from establishment to market stage of cacao alone. These practices cover soil health and fertility, soil and water conservation, and pests and disease management, among others. Generally, these practices are guided by these principles:

- Recycling organic materials
- Reducing use of chemical inputs
- Securing and enhancing soil health
- Maintaining or increasing agrobiodiversity
- Promoting economic diversification; and
- Co-creating knowledge

Specifically, for cacao cultivation, such practices include integrating nitrogen-fixing species with cacao and using proper shade trees, as well as using pruned branches and litterfall as mulch to increase soil organic matter. It also includes establishing contour lines made of natural vegetation or fodder grass in sloping lands to reduce soil erosion or building trash alleys around cacao trees.

Agroecological practices are found to bring various benefits to smallholder farmers. Firstly, it helps improve their overall farm productivity, as such practices are expected to enhance soil health and decrease the risk of pests and diseases outbreaks. Such practices also help smallholder farmers to have a more diversified and stable income since it

promotes the integration of several crops and helps in ensuring efficient use of resources. Lastly, it builds the smallholders' resilience to climate threats, as agroecological practices are expected to help improve the micro-climate of farms.

In line with this, the SFITAL project is currently conducting a series of trainings of trainers and trainings of farmers in Davao de Oro to capacitate local field extensionists and farmer leaders on specific agroecological practices, like integrated pest and disease management and soil and water conservation, among others. Highlights of the first TOT are also reported in this newsletter.

Additionally, the project has also started the establishment of learning farms in the municipalities of Laak, Maco, Nabunturan, and New Bataan, to demonstrate these agroecological practices, working with local farmer-cooperators. Details of the establishment are also presented in this newsletter.

Lastly, the project is crafting a technical guide on agroecological practices for environment-friendly and climate resilient cacao cultivation. This guide, which is expected to be produced this year, aims to complement existing reference materials used by local field extensionists in Davao de Oro on cacao cultivation. This is coupled with a sustainable cacao development curriculum that integrates existing trainings on cacao with agroecological practices. 🌱



Regular and proper pruning is an agroecological practice that prevents infestation of pests and diseases.



Gikan sa Yuta (From the ground) SFITAL capacitates local partners on cacao IPDM and shade management

As part of its capacity development efforts, SFITAL held a Training of Trainers (TOT) on integrated pest and disease management (IPDM) and shade management as agroecological practice for cacao cultivation last

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Atong mga higala (Our friends)



Mr. Fausto Juab and SFITAL site coordinator, Mr. Erwin Albios, sharing their learning farm activities in a Training of Trainers conducted by the project. Photo: ICRAF/Isabelle Dela Paz

Mr. Fausto Juab Nabunturan, Davao de Oro

Manong Fausto started intercropping cacao in his coconut farm more than a decade ago. Since tending to cacao requires time and labor, it has been challenging for him to manage the trees in the past years. This is not surprising for a 70-year-old working alone in his farm. This led to overshadowing and pest and disease infestation in his farm which also resulted in decreased harvest, further discouraging him from investing in cacao farming—a vicious cycle commonly experienced not only by Manong Fausto but by many smallholder cacao growers in Davao de Oro.

When presented with the opportunity to become a farmer-cooperator for the SFITAL learning farm in Barangay Katipunan, Nabunturan, Manong Fausto, without any hesitation, agreed to partner with the project. At present, he is working with the SFITAL project and other co-investing agencies (i.e., Provincial Agriculturist Office, Municipal Agriculture Office (MAGRO) of

Nabunturan, Kennemer Foods International (KFI), and DTI RAPID Growth Project) in demonstrating agroecological practices for environment-friendly and climate resilient cacao production.

Since the start of the partnership, Manong Fausto had been proactively fulfilling his role as farmer-cooperator of the learning farm, applying proper management to his trees with guidance from field extensionists from World Agroforestry, MAGRO Nabunturan, and KFI. Some of the key issues in his farm are overshadowing and presence of vascular streak disease and cacao pod rot, therefore, one of the first practices that Manong Fausto immediately applied in his farm is regular pruning. Since most of his cacao trees are UF 18, KFI also provided other clones for their clone diversification trial, which is expected to enhance pollination among trees. PAGRO also recently provided fertilizers that can help hasten recovery of his cacao trees, since many of these have

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SFITAL capacitates local partners on cacao IPDM and shade management (cont.)

21-22 February 2024 in Nabunturan, Davao de Oro.

Convening 38 local government agricultural technicians and extensionists, farmer-leaders, and other stakeholders, this TOT intends to capacitate them with the key principles of agroecological practice and promote its adoption in cacao farms in Davao de Oro through designing their own capacity development activities.

Cacao farms are susceptible to pest and disease infestations because of inadequate management practices. In return, its pods and other parts are at risk of rotting, ultimately affecting farm productivity and income.

The first day covered discussions on agroecological practices and their benefits, IPDM and shade management, including species' selection and proper pruning regime, and an on-field demonstration of proper pruning.

Dr. Rachmat Mulia, the SFITAL Principal Investigator for the Philippines, kicked off the training by presenting an overview of cacao-based agroecological practices. He emphasized that it naturally facilitates ecological processes including recycling of organic materials, reducing chemical inputs, enhancing soil health, ensuring livestock health, maintaining agrobiodiversity, synergizing various components, economic diversification, and co-creation of knowledge.

Following this discussion, Mr. Erwin Albios, SFITAL Site Coordinator for Davao de Oro, shared that through a combination of cultural, chemical, and physical control measures with minimal usage of pesticides and fungicides, IPDM reduces the presence of pests and diseases and improves cacao production. According to him, this approach minimizes the cost of control which then increases farmers' income.



Trainee participates in pruning demonstration during shade management training. Photo: ICRAF/Isabelle Dela Paz

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SFITAL capacitates local partners on cacao IPDM and shade management (cont.)



Trainees discuss their training design on IPDM and shade management.
Photo: ICRAF/Isabelle Dela Paz

Recommended IPDM practices include selecting disease-resistant varieties and field sanitization, among many other preventive measures.

The TOT also covered shade management as an integral part of proper cacao cultivation and IPDM. During the training, Albios enumerated the different criteria that farmers must consider when selecting shade tree species for the understory cacao trees such as height, density, arrangement, and canopy shape.

Albios also emphasized that shade management should consider the cacao trees' surrounding environment—for instance, there must be adequate water and air available to the trees while pruning, while ensuring that they are not over-exposed to sunlight.

To supplement the theoretical knowledge they gained, the participants engaged in on-field demonstrations of promoted agroecological practices like pruning and

species selection at the Project's learning farm in Nabunturan. During the field visit, Mr. Fausto Juab, the owner of the learning farm, also shared with the participants how his learning farm has played a crucial role in developing the capacities of his fellow farmers and other stakeholders in Davao de Oro.

The second day, on the other hand, focused on discussions on farm evaluation, and training design and facilitation.

After discussions on the use of using the ORID (Objective, Reaction/ Reflective, Interpretative, Decision) method and the basics of training design, the participants had the opportunity to discuss their observations in the farm and suggest potential interventions.

What's next?

To assess the effectiveness of the training, the SFITAL team implemented a pre-test and post-test as part of the training. Results of the tests showed that there was a significant

Atong mga higala (cont.)

many of these have been unmanaged and unfertilized for the longest time.

He has also been taking part in the Training of Trainers and Trainings of Farmers conducted by the project, lending his farm as venue for field demonstration. He also actively shares his experience and learnings with other farmers. During the recently conducted TOT on integrated pest and disease management,

he mentioned that being a farmer-cooperator allows him to improve his farm while also helping and inspiring other cacao growers.

It is true that change—whether in the behavior of smallholders or in actual cacao yield—does not happen overnight. But Manong Fausto's proactiveness is a testament of how farmers can be agents of change if only they will be given enough opportunity. 🌱

increase in the trainees' scores in the post-test compared to the pre-test, indicating improvement in their level of knowledge on the topic.

Another TOT will take place in the second quarter of 2024 to further capacitate local field extensionists and farmer leaders on agroecological practices. The first installment of the Training of Farmers (ToF)

is also on the horizon of the Project's upcoming activities as part of their capacity development efforts. This activity will be in collaboration with the different MAGROs in Davao de Oro.

Presentations used in this training are also downloadable through this [link](#). For updates on SFITAL activities like this, join CACAOmustahan on FB through this [link](#). 🌱

Davao de Oro kicks off development of sustainable cacao roadmap

Key stakeholders of the Davao de Oro's cacao industry convened for the initial planning workshop for the crafting of a sustainable cacao development roadmap last 27 February 2024 in Tagum City.

In line with SFITAL's goal to strengthen the technical, regulatory, and political

enabling environments, and mainstreaming inclusive, sustainable, and transparent small-scale producer commodity value chain in Davao de Oro, the Project facilitated this workshop, convening representatives from the provincial and municipal local government units, national government agencies,

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Davao de Oro kicks off development of sustainable cacao roadmap (cont.)



Local stakeholder presents key strategies for sustainable cacao production roadmap during workshop activity. Photo: ICRAF/Isabelle Dela Paz

agencies, academe partners, private sector partners, and farmer associations.

The first of a series of workshops, this initial activity intends to set the stage for roadmap development, covering discussions on its context, examples, and process. Through this workshop, the perspectives and inputs of the local enablers were integrated in determining the criteria, indicators, vision, and key strategies for developing the roadmap.

National, regional, and provincial context for roadmap development

Representatives from various local enabling institutions presented the regional and provincial contexts for roadmap development.

Mr. Dante “Toto” Muyco, the Chairperson of the Davao Region Cacao Industry Development Council, presented highlights of the Philippine Industry Development Roadmap. He stressed that the Philippines produces good quality cacao which has a strong domestic demand. However, according to him, the country’s cacao industry still faces many crucial issues that hinder sustainable cacao production. These challenges include low productivity level, high input and logistics cost, limited implementation of good agricultural practices and traceability, and lack of quality assurance system.

“The name of the game now is system, system sa production, system sa consolidation,” he said, emphasizing the need for synergized efforts from all sectors.

He mentioned the importance of LGUs in strengthening cacao production by supporting farmers with capacity development and farm inputs, as well as the academe’s significant role in studying value chains.

Representatives from the Provincial Agriculturist’s Office (PAGRO) then provided the provincial context, presenting highlights of the Provincial Commodity Investment Plan (PCIP) and the key issues of cacao production in the province. Engr. Jesyl Gutierrez, the province’s high value crops coordinator, discussed that crucial challenges such as limited resources, inaccessibility of equipment and facilities, inadequate knowledge, and high costs still prevail in the areas of cacao production, marketing, and processing.

Ms. Jyd Camay-Duque, Development Management Officer III from PAGRO, presented the key features of the PCIP. The PCIP is a strategic plan that aims to address these issues and intervene within the various segments of the value chain of commodities that are significant to the province, including cacao.



Ms. Jyd Camay-Duque discusses the PPAs for cacao commodity development in Davao de Oro. Photo: ICRAF/Isabelle Dela Paz

All hands on deck: strengthening multi-stakeholder collaboration

To gain a holistic perspective of how cacao roadmaps were developed in other countries, Dr. Betha Lusiana, the Project Coordinator for Indonesia, highlighted an example of a cacao roadmap in North Luwu District, South Sulawesi Province, Indonesia. She discussed the approach employed in their roadmap development, as well as the challenges and opportunities their Project team faced in this process. Dr. Mulia followed up on the discussion by providing context on how the Indonesian Project team’s experience is being similarly implemented in the Philippines.

Ms. Grace Ann Salvan, SFITAL Component 3 leader, also provided an overview of the entire roadmap development process so the stakeholders would know what is expected of them for the entire process.

Local enablers of the province’s cacao industry expressed their support in developing the sustainable cacao roadmap.

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Davao de Oro kicks off development of sustainable cacao roadmap (cont.)

Ms. Mary Jane Haom, the Division Chief of the Provincial Agriculturist's Office Planning Division, also extended her support, underlining the importance of the roadmap in implementing the province's projects in sustainable farming, especially with increasing the farmers' income and improving environmental services.

"We at DTI-RAPID really appreciate this initiative as it will be [covering] the strategic direction, harmonizing it with local development goals," said Ms. Beverly Pantinople, Provincial Coordinator of the DTI-RAPID Growth Project, which also covers cacao as one of its target commodities.

Atty. Reynaldo Castardo from Davao de Oro's Provincial Planning and Development Office also joined in with his full support for the initiative. "The Office is now updating the Provincial Development Plan, so this is a good opportunity to incorporate the concerns on cacao, and consequently to include cacao-related interventions in the investment plan", he highlighted.

"Every municipality should have a cacao council, and this should involve the youth for more innovation in the future," shared Mr. Juanito Aquino, a farmer-leader and the President of the Provincial Cacao Council. "The future councils should also be aggressive in sustaining partnerships with stakeholders," he added.

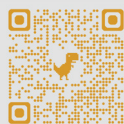
Academic institutions involved in cacao development, including the University of the Philippines Mindanao (UPMin) and Davao de Oro State College (DDOSC), also provided their manifestations. Mr. Jupite Mark Banayag, the Dean of the Agriculture Department of DDOSC emphasized that the academe plays an important role in knowledge generation and in developing relevant and responsive research from the production up to the utilization of cacao commodity for the benefit of the commodity. Seconding this, Mr. Joel Sagadal, Head of the UPMin Land Reservation Management Office, highlighting this initiative's alignment to their mandate to be the national university for research and public extension.

Puhon (in the future)

Series of TOFs on IPDM and shade management for selected Nabunturan cooperatives
April 2024

TOT on soil and water conservation as agroecological practice
June 2024

Second planning workshop for roadmap development
June 2024

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Go to <https://cacaomustahan.com> or scan the QR code!

Filling in the gaps

During the group discussion, the stakeholders envisioned a progressive and empowered life for cacao growers and entrepreneurs in Davao de Oro, creating world-class, high-quality, and profitable cacao products. To achieve this, they believe that cacao farms must be sustainable and productive, accompanied by a transparent, responsive, and inclusive governance within the cacao industry.

When asked about their descriptions of sustainable cacao production on the farm-level, the participants' responses generally fell into six thematic areas, specifically stable production and quality products; market and income of cacao growers; environmental friendliness; crop diversification in the farm; higher resilience from climate threats; social inclusiveness and gender equality; enabling conditions; and capacitated farmers.

Onward and upward

As part of the roadmap development process, a series of planning workshops will be conducted in 2024 to review existing roadmaps and development plans for sustainable cacao production at national and regional levels. The next one will take place in June 2024, where the draft roadmap will be presented and further enhanced with inputs from local stakeholders.

For more information, the activity report for the first planning workshop is accessible through this [link](#).

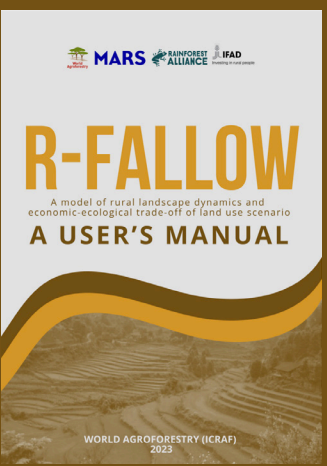


Kahinguhaan sa kahibalo (New publications)

R-FALLOW User's Guide

R-FALLOW is a model of rural landscape dynamics and economic-ecological trade-off of land use scenario created by World Agroforestry (ICRAF) for the Sustainable Farming in Tropical Asian Landscapes (SFITAL) to develop possible land use scenarios to guide local stakeholders in crafting a roadmap for sustainable cacao development.

This manual contains information on how to install, run, and use the R-FALLOW software. It must be noted that this manual is still at its draft stage. Read the full user guide [here](#).



The image shows the cover of the 'R-FALLOW A USER'S MANUAL'. At the top, it lists the logos for MARS, Rainforest Alliance, and IFAD. The title 'R-FALLOW' is prominently displayed in large, bold, orange letters. Below the title, it reads 'A model of rural landscape dynamics and economic-ecological trade-off of land use scenario' and 'A USER'S MANUAL'. The bottom of the cover features a photograph of a cacao plantation with a yellow wavy line graphic overlaid. The text 'WORLD AGROFORESTRY (ICRAF) 2023' is visible at the bottom of the cover.

SFITAL and local enablers commence establishment of learning farms on agroecological practices



Picking up from the planning and consultation meetings and site assessments done in 2023, the SFITAL Project, together with its local partners and farmer-cooperators, has started the establishment of learning farms to demonstrate agroecological practices for environment friendly and climate resilient cacao cultivation in January 2024.

Picking up from the planning and consultation meetings and site assessments done in 2023, the SFITAL Project, together with its local partners and farmer-cooperators, has started the establishment of learning farms to demonstrate agroecological practices for environment friendly and climate resilient cacao cultivation in January 2024.

As previously mentioned, the project is establishing four learning farms in the province, specifically in Laak, Maco, Nabunturan, and New Bataan. Towards the end of 2023, there had been changes in some of the farms and farmer-cooperators due to various factors.

For Nabunturan, Mr. Nick Juab was replaced by his brother, Mr. Fausto Juab, because he will be needing to commit more time in public service as he was elected as a barangay councilor. For New Bataan, Mr. Allan Sumugat also had to be replaced with Mr. Ronel delos Santos. The bridge connecting Mr. Sumugat's farm to the national road was washed out by the recent Great Agusan Flood, rendering his farm inaccessible for an indefinite period. The new farmer-cooperators were selected from the same farmer organizations and were selected based on

the same evaluation criteria. The table below shows the more updated list of farmer-cooperators:

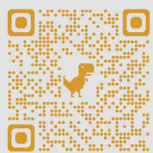
Farmer-cooperator	Farmer organization	Municipality
1. Antonio Talle	Talle Farmers' Association	Laak
2. Liberato Hermosa, Jr.	Dumlan Association of Cacao Planters	Maco
3. Fausto Juab	Katipunan Multipurpose Cooperative	Nabunturan
4. Ronel delos Santos	Comval Farmers Multipurpose Cooperative	New Bataan

Since the different farms have different issues, various interventions on soil health improvement, soil and water conservation, and pest and disease management are being implemented in these farms. One of the agroecological practices that the project has been promoting since the beginning is recycling organic material, which is now evident on the learning farms. For one, in the Nabunturan learning farm, Mr. Juab has been using decomposed cacao pods and coconut husk as mulch. On the other hand, Mr. delos Santos in the New Bataan learning farm is using decomposed coconut husk and dried pig manure as mulch around the base of the cacao trees, which is expected to maintain soil moisture, suppress weed growth, and improve soil fertility. In the Laak learning farm, decomposed corn cobs were also placed in the planting holes before planting new cacao seedlings.

The farmer-cooperators are also implementing regular pruning of existing cacao trees in their farms. For the Laak learning farm, the only one needing additional cacao trees, layouting and holing in preparation for the planting have been conducted.

Partner-enablers have also started implementing interventions in the learning farms. For example, KFI grafted scions of new clones in selected sections of the Nabunturan learning farm, as part of their clonal diversification trial. The Provincial Agriculturist's Office also provided some fertilizer to hasten the recovery of some of the trees in the learning farm.

SFITAL is also conducting regular monitoring, mentoring, and coaching with the farmer-cooperators to further capacitate them on agroecological practices. The mentoring sessions also enables co-creation of knowledge as cooperators are encouraged to provide suggestions on how they can further improve the management of their own farms. 🌱



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