



Roadmap for the Agroforestry Sector





Roadmap for the Agroforestry Sector

August 2024

► Acknowledgements

This policy paper has been prepared by Carlos Alberto Coca Gamito (International Consultant) as the main author, with valuable contribution from Richard Hanson (Programme Manager of the Agroforestry Skills for Employment and Resilience project), Tendy Gunawan (Rural Development TVET Officer of the Agroforestry Skills for Employment and Resilience project), and Susana Martins (Team Leader and Communication Coordinator of the European Union Delegation in Timor-Leste). The paper has also been shared and benefited from valuable contributions from the Ministry of Agriculture, Livestock, Fisheries and Forestry of Timor-Leste, Secretariat of State for Vocational Training and Employment (SEFOPE), National Institute for Labour Force Development (INDMO), Timor-Leste Trade Union Confederation (KSTL) and Trade Invest TL, and endorsed by the Project Steering Committee of the Agroforestry Skills for Employment and Resilience project.

This policy paper was funded by the European Delegation in Timor-Leste under the Agroforestry Skills for Employment and Resilience project. Its contents are the sole responsibility of the authors and do not necessarily reflect the views of the European Union.

► Foreword ILO

Timor-Leste is at a pivotal moment where agroforestry can serve as a significant driver of sustainable economic growth through diversification and improving community livelihoods. With strong Government commitment, agroforestry development is being prioritized alongside skills training.

Agroforestry is indeed central to efforts to enhance agricultural productivity in Timor-Leste. A thriving agroforestry sector depends on skilled workers across the entire value chain, from production and processing to business development. Beyond generating income and strengthening local economies, agroforestry also builds climate resilience, safeguards natural resources, and supports the country's transition toward a green and circular economy.

This Roadmap is designed to offer a clear and comprehensive guide to Government officials, development partners, and community leaders and groups on establishing the requisite foundations to equitably unlock agroforestry's full potential in developing Timor-Leste's economy and its people. The Roadmap highlights three critical areas to prioritize focus to reap the most gains: coordinated mechanism, policy support, and collaborative efforts.

This roadmap also concretely lays out strategic pathways for recognizing the essential role of workforce skills development for the sector to reach its full potential. It makes a case for important and timely investments in human capacity including that of farmers, extension workers, and institutions.

Funded by the European Union and implemented by the International Labour Organization (ILO), this Roadmap is developed under the ILO Agroforestry Skills for Employment and Resilience Programme in Timor-Leste that aims to promote green and sustainable economic diversification and resilience in Timor-Leste through private sector development and technical and vocational education training (TVET) for youth integration into the labour market or enhanced local entrepreneurship capabilities.

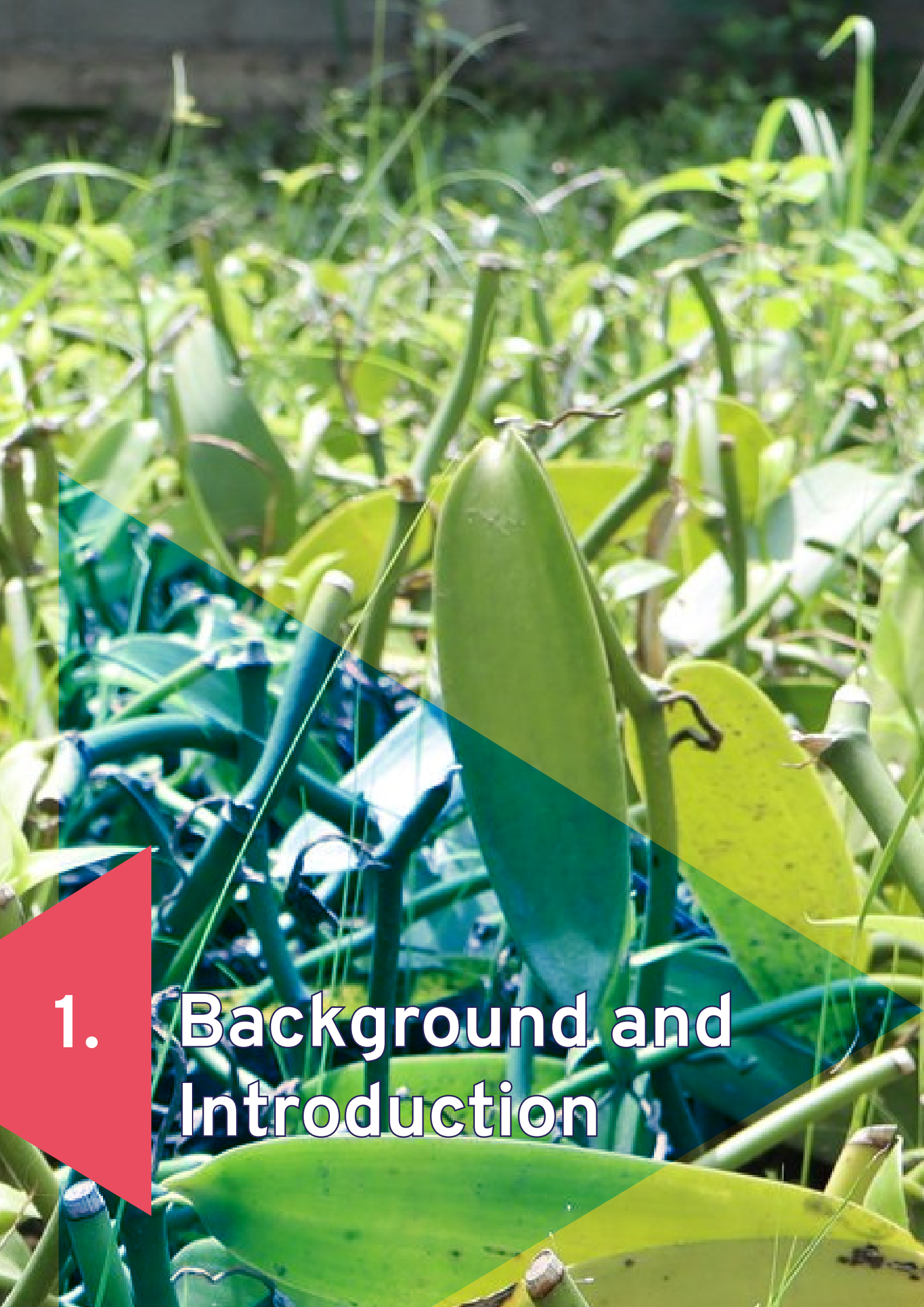
The successful implementation of this Roadmap can transform agroforestry into a cornerstone of Timor-Leste's agricultural sector, generating wealth, increasing food security, supporting environmental sustainability, job creation, and improving livelihoods for generations to come.

Simrin C. Singh

Director, ILO Country Office for Indonesia and Timor Leste

► Contents

1. Background and introduction	1
2. Agroforestry sector roadmap	3
Phase 1 laying down the enabling conditions for the development of agroforestry value chain businesses through operational research	4
Phase 2 building basic production capacity to serve the local market	4
Phase 3 scaling-up production and processing capacity to maximize capacity utilization, enhance quality, and diversify the economy	5
Phase 4 transitioning to capital intensive industrial model following an import-substitution strategy	5
Phase 5 consolidating a modern and export oriented industry that competes in international markets	6
3. Agroforestry skills development roadmap	8
Agroforestry sector roadmap process diagrams	9
Example of agroforestry road map for coconut value chain	10
4. Annex	10



1. Background and Introduction

► 1. Background and Introduction

Timor-Leste's Strategic Development Plan 2011-2030 emphasizes the enhancement of agrobiodiversity, focusing on nutritious and high-yield crops (GoTL, 2011).

The 9th Constitutional Government Programmes outlines the importance Agriculture in the diversification of the economy, and of Agroforestry system in Timor-Lest for agricultural production.

“Sustainable forest management for Timor-Leste's forest resources is critical for families and communities who depend on this resource for food, fuel and income generation and for farmers to consider the effect of deforestation on land erosion or slippage and water harvesting. If this does not exist, there will be no agricultural production”.

Some action points includes to: (i) Improve cultivation practices and agricultural productivity, develop actions to improve the production of specific and systematic crops according to the potential of each region of the country, also ensuring the objective of developing the productive sectors of the Nation; (ii) Establish a mechanism to support the transition from subsistence to modern market-orientated agriculture; and (iii) Implement new organic farming programmes, including marketing them internationally through marketing campaigns.

Agroforestry practices are not new to Timor-Leste as local farmers have been adopting appropriate models for many decades, some even for centuries. Agroforestry as a land management system can contribute significantly to balancing socio-economic and ecological functions of the land and help enhancing production and productivity. It plays an instrumental role in protection from natural disasters and extreme weather events and provides ecosystem services such as soil conservation and water retention. It promotes the conservation of local biodiversity, contributes to climate change mitigation and adaptation and has high potential to increase household income.

In Timor-Leste, with an increasing demand for food production and the need for economic diversification, while at the same time protecting the environment and biodiversity and adapting to climate change, promoting agroforestry can be a win-win solution.

However, in this fast-changing context, agroforestry land use needs systematic support and an enabling policy environment to match with the demands and needs of local communities and to maximise the income from the limited land available for agroforestry. Additional new knowledge and experience as well as institutional capacity and collaboration are the key areas that the government prioritises to improve agroforestry systems in Timor-Leste.¹

To realize an agroforestry system nation-wide that could increase agricultural production, improve the livelihood of people in Timor-Leste and economic growth of the country, a strategic roadmap for agroforestry sector is proposed.

The roadmap is presented in two sections covering:

1. The agroforestry sector in general with five defined steps or phases of development; and
2. Agroforestry skills development as contingent to the sector roadmap.

Human development is a basic requirement for the sector roadmap to work. Without skilled workers, the sector will not grow to its full potential. Whilst skills development detailed in the second section of the Road Map it is intertwined with development across the sector so is cross-referenced in the first section.

¹ Draft National Strategy and Technical Guidelines on Agroforestry Development [2022-2032]

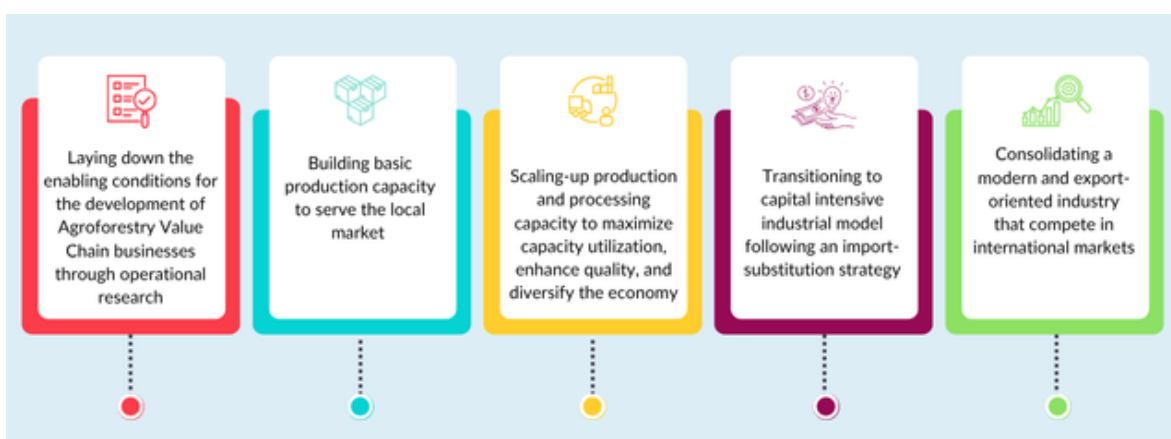


2. Agroforestry Sector Roadmap

► 2. Agroforestry Sector Roadmap

The roadmap is designed to guide policymakers, investors, and stakeholders through the phased development of Timor-Leste's agroforestry industry, ensuring that each stage of growth is strategically managed and human resources with the right skills are developed.

The Agroforestry Sector Roadmap is divided into five phases:



Each phase could have different timeline, from short term (1-5 years), medium term (5-10 years), and long term (> 10 years), that could be a reference for policy makers to develop the sector of agroforestry industry based on the potential in Timor-Leste and the demand of international market and to prepare skilled human resources for the industry to grow..

Phase 1, 2, and 3 require professional and skills development to improve basic production and processing of outputs, from seedling, cultivation up to harvest/ post-harvesting of products and their onward processing, with improved quantity and quality being key objectives. We refer this as Artisanal and Professional Skills Profiling and Development for the Agroforestry Value Chain in section 3

Phase 1 Laying down the enabling conditions for the development of Agroforestry Value Chain businesses through operational research

The development of the Agroforestry Value Chain in Timor-Leste requires a preliminary assessment of the country's agricultural potential for any agroforestry value chain.. During this phase, the sector will remain labour-intensive, relying predominantly on manual processing and supported by simple tools and traditional methods. The assessment might include:

- ▶ stakeholder analysis
- ▶ soil and location assessment;
- ▶ market research (domestic and international),
- ▶ identification of “best-bet” value chains for Timor-Leste;
- ▶ government strategic development/ sector expansion planning;
- ▶ feasibility of network of national nurseries;
- ▶ readiness of human resources including skills profiling and development for agroforestry value chains;
- ▶ capacity and readiness of quality and testing infrastructures,
- ▶ access to finance, especially for Small/ Medium Enterprises
- ▶ appraisal of regulatory framework
- ▶ institutional capacity building needs.
- ▶ Agroforestry sector SWOT analysis informed by above.

Phase 2 Building basic production capacity to serve the local market

The second phase of the roadmap focuses on building production capacity to serve the local market, with an emphasis on small producers. Although the local market in Timor-Leste is small, building the local market is absolutely crucial for several reasons:

- To build the basic production capacity
- To test the products and then upgrade to a better quality/ premium products



By promoting green and circular economy practices, this initiative also aims to reduce waste, enhance sustainability, and improve the economic benefits of production in Timor-Leste.

Phase 3 Scaling-up production and processing capacity to maximize capacity utilization, enhance quality, and diversify the economy

During Phase 3 production and processing will be scaled up with the aim of maximizing capacity utilization, enhancing the quality of products, and diversifying the economy with a broader product range. Building on the foundations laid in Phase 2, this phase focuses on increasing efficiency, implementing robust quality control measures, promoting local market penetration, and adopting sustainable practices.

During this period, the economic model will still be based on the intensive utilization of labour, supported by simple tools and machines. The proposed mixed capital-labour model with semi-manual processing of raw products will foster efficiency and productivity growth within the industry.

The scale-up of local production and processing capacity will be accompanied by quality improvements, the adoption of green and circular economy principles to enhance productivity efficiency, and new investments in Research and Development and Innovation (R&D&I) to foster economic diversification.

The private sector is expected to assume most of the costs of developments in this phase, with commercial banks and cooperatives providing liquidity as needed to the household production units. The government can start phasing out production subsidies. This strategy will foster productivity efficiency while allowing the industry to maintain profit margins without further increasing market prices.

Activities of phase 3 might include, for example:

- (i) Increasing processing capacity into higher added-value products, including sourcing expertise to develop and deliver demand driven skills training;
- (ii) Institutionalizing agroforestry skills development and developing industry-led sectoral skills committee;
- (iii) Implementing quality control and certification;
- (iv) Facilitating linkages to financial institutions;
- (v) Promoting locally-processed goods in local markets;
- (vi) Adopting green and circular economy principles

Phase 4 Transitioning to capital intensive industrial model following an import-substitution strategy

Phase 4 will transition from traditional household processing to capital-intensive industrial plants. Automatic processing of raw products, leveraging significant capital investment, will result in higher efficiency, labour productivity, and product quality. The expansion of locally produced goods will be accompanied by quality improvements, further developments within the green and circular economy to enhance productivity efficiency, and increased investments in R&D&I to foster economic diversification.

The transition from traditional household production to industrial processing will initially result in job losses but at the same time, between Phase 3 and Phase 4, output turnover and productivity will increase. Industrialization will increase the added value created by the industry, demonstrating higher processing efficiency and increased labour productivity.

Some programme under Phase 4 could include:

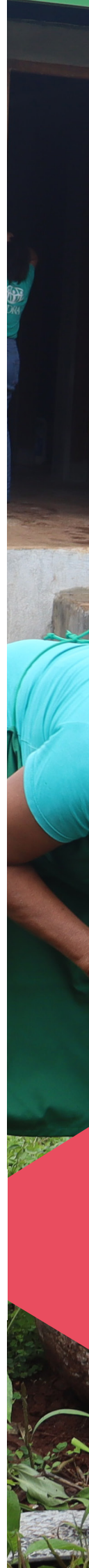
- (i) Progressive industrialization of the value chain;
- (ii) Training and certification for manufacturing professionals
- (iii) Strengthening of the national quality control and certification system;
- (iv) Promoting the national industry in local and foreign markets;
- (v) Adopting green and circular economy principles;
- (vi) Expanding and diversifying the production of goods

Phase 5 Consolidating a Modern and Export Oriented Industry that Competes in International Markets

In Phase 5, the industry will be fully automated and capital-intensive, progressively adopting new and more efficient processing technologies and expanding its production towards more sophisticated and higher added-value goods.

The consolidation of the capital-intensive industrial model will have an employment cost in the short term. But at the same time, output turnover will increase while the industry-generated value will grow. Industrialization will increase the added value created by the manufacturing sector, as a result of economic diversification, increasing exports, enhanced product quality, and the adoption of more efficient technologies.

Phase 4 and 5 requires professionals and skills development that will be able to operate large -scale processing industry to meet the demand of the international market. We refer this as Industrial Manufacturing Professional and Skill Profiles for Agroforestry Value Chain in [section 2.2](#).





3. Agroforestry Skills Development Roadmap

► 3. Agroforestry Skills Development Roadmap

The Agroforestry Skills Development Roadmap will be divided into two stages, in line with the development of the agroforestry sector:

1. Artisanal and Professional Skills Profiling and Development for the Agroforestry Value Chain
2. Industrial Manufacturing Skills Profiling and Development for Agroforestry Value Chain

The artisanal skills profiles will be in line with Phase 1-3 of the agroforestry roadmap and the industrial manufacturing skill profiles will be in line with Phase 4-5 of the agroforestry roadmap.

Agroforestry sector roadmap	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5
Agroforestry Skills development roadmap	Artisanal Skills Profiles			Industrial Manufacturing Skills Profiles	

The link between the two are shown below:

More detailed diagram is shown below

Development of skills profiles could take a step by step approach:

1. Defining the context of skills development in relationship to the policy framework
2. Identify the 'best bet' value chains to realise the agroforestry potential of Timor-Leste
3. Analyze and develop the value chains breaking them into the key stages of production from farm to market to consumer
4. Recognizes jobs/ skills required at each stage - with responsibility for training provision
5. Institutional development:
 - a. Institutional capacity building for National Technical Agency / Agroforestry Skills Council/ Quality Assurance mechanism/ Training Providers, etc
 - b. Development of labour market information
6. Occupational standards/ curriculum/ materials development. Training of trainers
7. Training delivery at field/ training institutions/ workplace
8. Monitoring and evaluation, including tracing of graduates (loop to labour market information)

The EU-funded Agroforestry Skill for Employment and Resilience Programme is following the above steps to develop skills and professional profiles in coconut, vanilla and cocoa value chain.

A comprehensive roadmap of coconut value chain, comprising both industrial and skills/ professional roadmap has been developed as an example of what could be developed for other value chains in Timor-Leste.

► Agroforestry Sector Roadmap Process Diagrams



► 4. Annex

► Example of Agroforestry Road Map for Coconut Value Chain

PHASE					
	1	2	3	4	5
	Laying down the enabling conditions for the development of Agroforestry Value Chain businesses through operational research	Building the capacity of producers and processors to serve the local market	Scaling-up Production and Processing Capacity to Maximize Capacity Utilization, Enhance Quality, and Diversify the Economy	Transitioning to Capital Intensive Industrial Model following an Import-Substitution Strategy	Consolidating a Modern and Export Oriented Industry that Compete in International Markets
Timeline	2024 - 2026	2027 - 2031	2032 - 2037	2038 - 2055	2056 - 2066
Programmes	1. Soil Assessment 2. Market Research 3. Expansion of Coconut Harvested Area with High-Yield Varieties 4. Establishing a Network of National Nurseries 5. Institutional Capacity Building 6. Artisanal Skills Training and Development	1. Increasing Processing Capacity into Higher Added-Value Coconut Products 2. Quality Certification and Control Initiative 3. Promoting Locally Produced Coconut-Based Goods in Local Markets 4. Green and Circular Economy Campaign 5. Artisanal Skills Training and Development	1. Increasing Processing Capacity into Higher Added-Value Coconut Products 2. Implementing Quality Control and Certification 3. Promoting Locally Produced Coconut-Based Goods in Local Markets 4. Adopting Green and Circular Economy Principles 5. Expanding and Diversifying the Production of Coconut Goods 6. Industrial Skills Training and Development	1. Progressive Industrialization of the Coconut Value Chain 2. Strengthening of the National Quality Control and Certification System 3. Promoting the National Coconut Industry in Local and Foreign Markets 4. Adopting Green and Circular Economy Principles 5. Expanding and Diversifying the Production of Coconut Goods 6. Industrial Skills Training and Development	1. Strengthening Automation and Capital Investments within the Coconut Processing Industry 2. Enhancing the National Quality Control and Certification System 3. Promoting the National Coconut Industry in Local and Foreign Markets 4. Adopting Green and Circular Economy Principles 5. Expanding and Diversifying the Production of Coconut Goods 6. Industrial Skills Training and Development

PHASE					
	1	2	3	4	5
Estimated investment (2024)	USD 5,719,587	USD 116,378,702	USD 221,348,116	USD 1,132,792,474	USD 1,582,552,616
Estimated income (2024)	N/A	USD 79,665,000	USD 154,331,417	USD 1,508,083,576	USD 3,770,304,381
Estimated employment generation	1,852	21,064	45,236	170,175	159,137
Skills profiles	Artisanal and Professional Skill Profiles for the Coconut Value Chain		Industrial Manufacturing Skill Profiles for the Coconut Value Chain		
	Coconut tree growers (ISCO-6112) Coconut seedling nurses (ISCO-6113). Coconut farming (ISCO-9211) Nursery (ISCO-9214), Coconut materials graders and testers (ISCO-7543) Coconut shell treaters (ISCO-7521) Coconut fruit preservers (ISCO-7514) Coconut food and beverage tasters and graders (ISCO-7515) Coconut materials craftpersons (ISCO-7318) Skilled agricultural and forestry workers (ISCO-6) Craft and related trades workers (ISCO-7)		Steam engine and boiler operators (ISCO-8182) Coconut edible products machine operator (ISCO-8160) Coco peat and fibre preparing, spinning, winding, bleaching, and cleaning machine operators (ISCO- 8159) Activated carbon processing plant operators (ISCO-8112) carbon processing plant operators (ISCO-8112) Coco peat and fibre preparing, spinning, winding, bleaching, and cleaning machine operators (ISCO- 8159) Coconut edible products machine operator (ISCO-8160) Steam engine and boiler operators (ISCO-8182), and packing, bottling and labelling machine operators (ISCO-8183).		



International
Labour
Organization

**Country Office for Indonesia &
Timor-Leste**

Dili Office
UN Compound
1st Caicoli Street
DILI - Timor-Leste

DOI: <https://doi.org/10.54394/QLLB9581>

