EVALUATION

Ministry for Foreign Affairs of Finland

JOINT EFFORTS FOR A GREEN FUTURE: EVALUATION ON FINLAND'S DEVELOPMENT COOPERATION IN ENVIRONMENT AND SUSTAINABLE USE OF NATURAL RESOURCES, AND PRIVATE SECTOR OPPORTUNITIES

Volume 2a • Forests, Ecosystems and Biodiversity

Evaluation on Finland's Development Policy and Cooperation

2026/1

This report can be downloaded through the home page of the Ministry for Foreign Affairs
https://um.fi/development-cooperation-evaluation-reports-comprehensive-evaluations

Contact: EVA-11@gov.fi

ISBN 978-952-281-848-5 (PDF)

ISSN 2342-83411

Layout: Grano Oy

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JOINT EFFORTS FOR A GREEN FUTURE: EVALUATION ON FINLAND'S DEVELOPMENT COOPERATION IN ENVIRONMENT AND SUSTAINABLE USE OF NATURAL RESOURCES, AND PRIVATE SECTOR OPPORTUNITIES

FORESTS, ECOSYSTEMS AND BIODIVERSITY SUB-SECTOR EVALUATION REPORT

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2026/1

This evaluation was commissioned by the Ministry for Foreign Affairs of Finland to Particip GmbH. This report is the product of the authors, and responsibility for the accuracy of the data included in this report rests with the authors. The findings, interpretations, and conclusions presented in this report do not necessarily reflect the views of the Ministry for Foreign Affairs of Finland.

This report incorporates the use of Artificial Intelligence (AI) technologies to enhance and support the evaluation process. AI tools were employed to assist document review through the identification of relevant sources and to enable broader contextual research, including targeted searches. In addition, AI-based language tools were used to support proofreading and to improve clarity, coherence, and readability. The AI tools or techniques utilised in this report adhere to EVA-11's requirements, ensuring ethical and responsible use, transparency, validation of results, and compliance with relevant internal regulations. For details on the specific AI methodologies and tools used and details regarding the validation of AI-generated results, refer to section/Annex 1 of this report.

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Acronyms and Abbreviations

AI	Artificial Intelligence
CSO	Civil society organisation
DFONRMP	Decentralised Forest and other Natural Resources Programme
EFSD+	European Fund for Sustainable Development Plus
EQ	Evaluation Question
EU	European Union
EUR	Euro
FAO	Food and Agriculture Organization of the United Nations
FINNFOR	Integrated Environmental and Forest Management Co-operation Project in Central America
FOPER	Forest Policy and Economics Education and Research project
FORLAND	Forestry, Land Use and Value chains Development in Tanzania Project
FORMIS	Development of Management Information System for the Forestry Sector Project
FORVAC	Forestry and Value chains Development (Tanzania) Project
GEF	Global Environment Facility
GIS	Geographic Information Systems
GPS	Global Positioning System
ha	Hectare/s
ICI	Institutional Cooperation Instrument
ICT	Information and Communication Technology
INFORES	National Forest Resources Monitoring and Assessment at regional and local levels in Tanzania (INFORES)
IUCN	International Union for Conservation of Nature
MFA	Ministry for Foreign Affairs (Finland)
NAFORMA	National Forest Resources Monitoring and Assessment
ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
PDR	(Lao) People's Democratic Republic
PFG	Informed forestry decisions, sustainable forest management and forest certification in smallholder forests in Vietnam Project – Participatory Forest Governance
PFP	Private Forestry Programme
PIF	Public Sector Investment Facility
REDD+	Reducing Emissions from Deforestation and Forest Degradation, and the role of conservation, sustainable management of forests, and enhancement of forest carbon stocks in developing countries
SDG	Sustainable Development Goal
SNGS	Strengthening National Geographic Services in Laos Project
SUFORD	Sustainable Forestry and Rural Development Project (in Lao PDR)
TOSP	Tree Outgrowers Support Programme
UN	United Nations
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
USD	United States Dollar
WWF	World Wide Fund for Nature
ZAPROPA	Zambia ProMs Partnership

1 Summary

This document reports on an evaluation of work funded in 2010–24 by the Ministry for Foreign Affairs of Finland in the Forests, Ecosystems and Biodiversity sub-sector within the Environment and Natural Resources policy priority area, as part of the wider Evaluation on Finland's Development Cooperation in Environment and Sustainable Use of Natural Resources and Private Sector Opportunities. It is one of the four sub-sector reports with results feeding a synthesis report. The other sub-sectors are: (i) Clean Energy, Circular Economy, and Critical Minerals, (ii) Disaster Risk Reduction and Meteorology and (iii) Water as a Natural Resource. All four sub-sector studies aim to answer one summative question: *"What results, including any realised or emerging impact, has Finland generated in this sub-sector during the period under evaluation?", and one formative question: "What concrete and context-specific opportunities, entry points and models are there for Finland for partnering with Finnish and local companies and economic actors within the sub-sector topic(s) in the next five years?"*. All will support a later synthesis report.

The evaluation applied a mixed-methods, theory-based, macro-level and realist design built around a theory of change for the Forests, Ecosystems and Biodiversity sub-sector. Core methods included portfolio review, 'moderate' and 'intensive' desk studies using structured proformas, semi-structured interviews, in-country consultations (Tanzania and Vietnam), e-survey, market analysis focused on private sector engagement, like-minded peer country review, geospatial analysis (Tanzania), and supportive use of natural language processing for document navigation. Evidence was triangulated across documents, interviews and geospatial analysis. Interviewees spanned policy-level, intervention-level and private-sector knowledge-holders across MFA, embassies, multilateral partners, non-governmental organisations, research bodies and companies. A total of 67 informants shared their views for this evaluation: 31 policy-level, 25 intervention level, 6 private sector, and other knowledge-holders. All evidence was used to support the reporting of findings, conclusions and potential action points (see below).

KEY RESULTS	SUSTAINABLE DEVELOPMENT GOAL
Answers to Evaluation Questions 1.1 (a, b, c) and 1.2 on results and impacts, induced changes and benefits/beneficiaries Across Finland-supported bilateral and civil society interventions, strong environmental outcomes (long-range result 1) were evidenced, with approximately 11.1 million hectares brought under protection, sustainable management or restoration (FORVAC, Tanzania, 2017–2024: 460,518 ha; DFONRMP/DFA, Zambia, 2015–2019: 32,707 ha; WWF Finland, global, 2018–2024: 6.7 million ha; Siemenpuu, global, 2018–2025: 3.9 million ha). (SDG 15) Deforestation fell inside community-managed forests while comparable reference areas continued to lose tree cover, with tree-cover loss held to 0.88% inside village land forest reserves versus 5.44% in surrounding areas, maintaining about 286,811 hectares of tree cover within a 416,301-hectare area (FORVAC, Tanzania, 2017–2024). (SDG 15) With multilateral partners, 238 million hectares of terrestrial ecosystems (IUCN, global, 2021–2024: 11 million ha; GEF, global, 2018–2024: 227 million ha) (SDGs 13, 15) and 1.5 billion hectares of marine ecosystems (GEF, global, 2018–2024) have been protected or restored. Sustainable production and livelihood effects were notable (SDGs 1, 8, 15). In Tanzania, plantation forest/smallholder wood supply expanded with over 11,000 hectares of new or rehabilitated woodlots and plantations, of which 6,811 hectares independently verified (PFP I–II/TOSP, 2017–2024). Community forestry generated more than EUR 4 million in local revenues with around 55% reinvested and household-level income effects estimated at about 12% of average income in participating villages (FORVAC, Tanzania, 2018–2024). Across programmes, at least 8,700 micro, small and medium-sized enterprises received support (WWF Finland, global, 2018–2024; FORVAC, Tanzania, 2018–2024; PFP II, Tanzania, 2019–2024). At the macro level, Tanzania's forest-asset value was estimated to rise by about EUR 0.5 billion between 2014–2021 alongside stronger smallholder supply, though not a result of Finland alone. Equity, rights and inclusion advanced in parallel (SDGs 1, 5, 10, 16). In Tanzania, community-managed forests channelled a majority share of revenues into community development funds, improving women's and youth participation in decision-making and benefit-sharing (2017–2024). Across programmes, Finnish support reportedly benefitted 89,804 women, 62,374 indigenous/minority persons and 22,913 persons with disabilities (WWF Finland, global, 2018–2024; FORVAC, Tanzania, 2017–2024), while more than 64,000 families saw formalisation of land and resource rights (Siemenpuu, global, 2015–2025). Policy, legal and institutional reforms were institutionalised where mandates and budgets held and producer organisations consolidated (SDGs 12, 13, 15, 16, 17). Zambia expanded community forests from about 30,000 hectares (2015) to over 1 million hectares (2019) following a statutory instrument, a national seven-step procedure and community by-laws, with 32,707 hectares designated directly by a Finnish programme (DFONRMP/DFA, 2015–2019). Lao PDR embedded participatory sustainable forest management across roughly 2.3 million hectares and 1,078 villages, about 73% of the production-forest estate, linking approved plans to revenue-sharing and village rules (SUFORD, 2003–2017). Kenya consolidated its framework via the Forest Conservation and Management Act (2016) and organisational upgrades in Kenya Forest Service (2016–2019), while Tanzania issued planning guidelines, participatory village land-use tools and a FLEGT legal-trade review strengthening compliant value chains (2018–2024). Finnish-funded civil society work reinforced uptake: WWF Finland influenced 62 policies/decisions/investments, supported 94 land-use/forest/watershed plans and 35 nature-based/adaptation initiatives, and capacitated 347 local civil society organisations and 2,805 duty-bearers; regional instruments advanced, including the EAC Forest Policy/Strategy and a Southern African Development Community mechanism for seized timber stockpiles (Global/Southern Africa, 2022–2024). Information systems and clarified procedures shifted day-to-day practice towards evidence-based, rules-driven management (SDGs 13, 15, 16, 17). Vietnam converted paper-based forest monitoring into a nationwide digital system used across all 60 provinces, scaling to several thousand communes with approximately 1,300 active government forestry users and supporting Forest Law Enforcement, Governance and Trade/REDD+ compliance (FORMIS I–II/PFG, 2016–2020).	**Primary relevance (EQ1)**  **Secondary relevance (EQ1)** 

KEY RESULTS	SUSTAINABLE DEVELOPMENT GOAL
In Tanzania, NAFORMA delivered the first multipurpose national inventory and decision-grade statistics, including a quantified 19.5 million m³ annual wood deficit, that informed revision of the National Forestry Programme, while INFORES produced biomass/carbon data enabling national Forest Reference Emission Levels (FREL) and Paris Agreement reporting and supported research and miombo regeneration analysis (2015–2019). The forest resources management information system expanded from civil-society pilot to national timber-consignment tracking with real-time passes and e-revenue (PFP II/FORVAC/TFS, 2019–2024). Globally, FAO's Forest Resources Assessment-2025 online platform further harmonised reporting—improving traceability across forest management information systems/ SDG/UN Economic Commission for Europe processes (2023–2024). 'Do no harm': No systematic negative environmental effects were evidenced; risks remained around biodiversity outcomes in exotic plantations, and around fire/ drought/pest exposure, underscoring the need for landscape-level biodiversity measures and risk management (Tanzania, 2017–2024).	
Answers to Evaluation Question 1.3 on most effective approaches Rights-based community forest management proved effective, with formalised tenure, mapped boundaries and clear village procedures reducing illegal use and supporting credible supervision. (SDGs 15, 16) Forest loss was reduced and results endured where local institutions were resourced. (SDGs 15, 16) Strengthening state capacity and legal frameworks anchored local practice in law, mandates and budgets, translating community rights into routine compliance and improving durability beyond project cycles. (SDGs 16, 15) A data-first approach – participatory inventories with operational forest management information systems and traceability – made planning and enforcement transparent and repeatable, aligned local decisions with national reporting, and sustained outcomes when systems were institutionalised and maintained. (SDGs 15, 16, 12) Effectiveness and sustainability increased further where these approaches were sequenced and paired with Institutional Cooperation Instrument projects alongside bilateral programmes, which convened capable partners, reinforced forest management information system uptake, and built lasting capacity. (SDGs 17, 16, 15)	
Answers to Evaluation Question 1.4 on Finnish added value Finland's context-specific added value lay in exporting world-class forest informatics and measurement know-how with a clear demand by partners – national forest management information systems platforms and global, open tools that standardised data, strengthened compliance/monitoring, reporting and verification and, in countries like Tanzania and Vietnam, continued to deliver beyond project life. (SDGs 15, 13, 16, 17) This distinctive technical credibility, recognised by governments, FAO and peers, made Finland the trusted "go-to" actor when robust, interoperable information systems and forest inventory capacity were prerequisites for results. (SDGs 17, 16) Operationally, Finland generated results by combining instruments and partnerships. (SDGs 17, 16) Bilateral + Institutional Cooperation Instrument + FAO (+, at times, Finnfund) were sequenced to build institutions, methods and skills, with clear country tailoring (e.g. Kenya's IC-FRA feeding the Forest Information System; Tanzania's INFORES building on NAFORMA and linking with PFP/FORVAC; Vietnam's FORMIS complemented by community-level piloting via PFG). (SDGs 17, 16, 15) Where mature relationships and trust existed, most visibly in Tanzania, Finland could broker coherence across public programmes and private investees (e.g. TOSP). (SDGs 17, 8, 16) Normatively, Finland's comparative advantage was more indirect and concentrated in multilateral arenas than in bilateral policy reform. (SDGs 17, 16) By hard-wiring monitoring, reporting and verification and e-tracking (e.g. forest resources management information system in Tanzania) into partner systems, Finland enabled policy implementation and compliance pathways even when it was not fronting the dialogue. (SDGs 13, 15, 16) Normative influence is practiced chiefly through multilateral governance and agenda-setting on climate/biodiversity. (SDGs 17, 13, 15) However, Finland's marginal contributions and diminishing official development assistance is feared to limit this influencing avenue. (SDG 17)	

KEY RESULTS	SUSTAINABLE DEVELOPMENT GOAL
Answer to Evaluation Question 2.1 on market conditions affecting Finnish private sector engagement Digital forest information and compliance technology is in clear demand across East Africa, Southeast Asia and parts of Latin America and the Caribbean, with demand increasing and expanding to traceability because of the requirements linked to the European Union Deforestation Regulation. (SDGs 12, 15, 16) In addition, in countries where donors are active in the sector, community-based forestry and ecosystem management services show continuous demand. (SDGs 15, 16) Finland should approach these demands focusing on its competitive advantage of advanced technical systems and participatory governance and making use of the expanding blended finance and concessional financing mechanisms. (SDGs 17, 16, 15) Where GEF or UNEP (and other multilateral organisations) have laid down credible data systems, clarified rules and social safeguards, and built micro-, small-, and medium-sized enterprise demand, Finnish firms may face lower entry barriers and clearer buyer mandates in Forests, Ecosystems and Biodiversity tenders. (SDGs 17, 16, 8, 15) For Finnish companies, the practical approach is to anchor offers in these enabling-environment gains (for example, interoperability with NAFORMA in Tanzania and Vietnam monitoring, reporting and verification), pair with Team Europe, GEF, or Green Climate Fund finance where relevant, and highlight lifecycle compliance and rights-based delivery. (SDGs 17, 12, 16, 15)	**Relevance (EQ2)** 
Answer to Evaluation Question 2.2 (a, b) on potential gains for Finnish businesses and development cooperation Finnish companies are likely to make commercial gains by anchoring offers in forest management information systems and traceability and leveraging Public Sector Investment Facility/European Fund for Sustainable Development Plus financing, and their capability gains are likely to arise from deeper positioning in Team Europe and scalable Nordic consortia. (SDGs 8, 12, 17, 15) Potential development outcomes from deepening the engagement of the private sector include stronger governance, which can lead to benefits to local communities and climate and biodiversity impact. (SDGs 16, 13, 15) Finnfund's investments in forestry already show measurable climate and livelihood impacts, and their human rights-based approach and environmental, social, and governance practices increase the development additionality. (SDGs 13, 8, 16) Systemic value would emerge when Finland's various private sector instruments are used in a complementary manner to reduce barriers to market entry, support procurement, and scale promising solutions. (SDGs 17, 8, 9) For Finnish companies operating in Forests, Ecosystems and Biodiversity markets, this integrated approach could create a financing and support ecosystem that strengthens both commercial viability and development impact. (SDGs 17, 8, 9)	

KEY RESULTS	SUSTAINABLE DEVELOPMENT GOAL
Answer to Evaluation Question 2.3 on promising models for Finnish private sector engagement Promising approaches to private sector engagement in Forests, Ecosystems and Biodiversity markets include (i) a 'forest management information systems–to–Compliance Ladder', (ii) creation of Nordic consortia focused on 'Nature-Data and Water–Forest Nexus' solutions, and (iii) systematic development of local operation and maintenance ecosystems. (SDGs 15, 6, 17, 9) The 'forest management information systems–to–Compliance Ladder' approach would position Finnish companies to deliver end-to-end digital solutions that start with basic forest inventories and scale up to advanced compliance and traceability systems. (SDGs 15, 12, 16) The Nordic 'Nature-Data and Water–Forest Nexus' approach would allow Finnish firms to expand their commercial reach and build institutional capacity for partnership management, knowledge sharing, and innovation. (SDGs 6, 15, 17, 9) Building local operation and maintenance ecosystems would not only secure the durability of Finnish solutions but also create shared value through local job creation, institutional strengthening, and sustainable development outcomes. (SDGs 8, 16, 9, 15)	

Conclusions

1. Environmental benefits are achievable at scale when conservation is embedded in governance systems and economic incentives. Fragmented design and premature exits limited the consistency of results, while long-term cooperation achieved impact and lasting results.
2. Biodiversity integration was uneven: global and civil society partners delivered tangible biodiversity benefits, while bilateral programmes prioritised forest cover and production over biodiversity outcomes.
3. Support to forest management information systems, an example of Finnish added value, has been among the most successful and strategically justified areas of Finnish support producing sustained outputs.
4. Community-based forest management emerged as Finland's most effective and replicable approach, but its success depends on secure tenure, institutional capacity, and continuity of support.
5. Support to value chain development is a well justified area of Finnish support. However, results have been weak, largely because private sector has not been fully involved in the process.
6. Finland's bilateral, Institutional Cooperation Instrument and civil society organisation support proved complementary, with synergies strongest where Institutional Cooperation projects paired with bilateral programmes to consolidate technical systems and capacities.
7. While combining instruments enabled complementary projects, and a high-quality capacity-building focus helped secure the sustainability of results, Finland largely left policy influencing and high-level dialogue to partners, factors also critical to long-term sustainability.
8. The structure of Finland's Forests, Ecosystems and Biodiversity portfolio shifted from bilateral to multilateral and civil society organisation channels, reducing Finland's direct possibilities to influence. This shift was largely driven by budgetary cuts rather than deliberate strategic choice.

9. The effectiveness of geospatial analysis as an evaluation tool is only as strong as the quality of the underlying data, making systematic data management a critical requirement for future projects.
10. Finland's dual value proposition, advanced technical systems paired with participatory governance, can make Finnish private sector competitive in the markets which demand digital forest information and compliance technology and engagement in community-based forestry and ecosystem restoration.
11. For Finnish companies, engaging in Team Europe and Global Gateway initiatives is a strategic investment in organisational capacity that directly supports sustainable growth in Forests, Ecosystems and Biodiversity markets. On balance, the promise of commercial gains from forest management information systems, monitoring, reporting and verification, and traceability solutions, when supported by Public Sector Investment Facility and European Fund for Sustainable Development+, outweighs the challenges.
12. While we may not yet be fully there, the systemic value of private sector engagement lies in the ability of the existing instruments to work together as a coherent pipeline – from pilot to procurement to investment to regional scale.
13. Promising private sector engagement tactics in Forests, Ecosystems and Biodiversity call for integrated, step-wise, collaborative, strategic and systemic approaches.

Potential action points

1. Continue support to Forests, Ecosystems and Biodiversity sector. Scale community-based forest management through longer horizons and delegated cooperation.
2. Synergistic approaches across the Environment and Natural Resources sub-sectors should be sought to address the multiple crises of climate, biodiversity and security – and to link nature with human security.
3. Reorient value chain support towards market access and private-sector participation from the outset, grounded in a comprehensive analysis of institutional and technical bottlenecks and an explicit risk-management plan, with early buyer/off-taker commitments.
4. Sustain and increase biodiversity support.
5. Standardised and verifiable geospatial datasets should be applied in forestry projects to make meaningful geospatial analysis as easy as possible in future.
6. Look into more effective methods to incorporate private sector engagement in both bilateral and multilateral channels.
7. Look into more effective methods to support private sector and civil society organisation collaboration.
8. MFA and its implementing partners, Finland's embassies and Finnfund require sufficient human and financial resources to actively engage Finnish private sector in Forests, Ecosystems and Biodiversity-interventions.

2 Introduction

2.1 Scope and purpose

This document reports the findings and conclusions of an evaluation of work funded by the Ministry for Foreign Affairs of Finland (MFA) in the Forests, Ecosystems and Biodiversity sub-sector of the Environment and Natural Resources policy priority area. It is part of a larger Environment and Natural Resources evaluation that also encompasses three other sub-sectors: Clean Energy, Circular Economy and Critical Minerals, Disaster Risk Reduction and Meteorology, and Water as a Natural Resource. This and the other sub-sector evaluations are ultimately intended to be used in support of a synthesis report which will present findings, conclusions and recommendations from the Environment and Natural Resources evaluation as a whole.

The **purpose of this evaluation** is to provide the MFA and its stakeholders with information on the achievements, merits and worth of implementation of this policy priority area. The evaluation is to provide evidence-based recommendations on future directions for increased effectiveness for Finland to consider when it engages with this theme with a longer-term time perspective as well as well as inform MFA stakeholders about the achievements. The evaluation also aims to deepen understanding of Finland's contributions to the 2030 Agenda, particularly in relation to Sustainable Development Goal (SDG) 13 (climate action), SDG 15 (life on land), and SDG 17 (partnerships for the goals).

This sub-sector evaluation has both summative and formative dimensions. The specific objectives are:

1. To harvest and evaluate results (obtained and sustained), successes and challenges in achieving the objectives of the policy priority area and its sub-sectors (summative);
2. To present a synthesis of results and impacts, including early/emerging impacts (summative);
3. To identify and analyse opportunities, means and measures for engaging Finnish private sector actors into this work in the future (formative);
4. To provide realistic evidence-based policy and operational recommendations for the future, with due attention to the limitations in financial and human resources available (formative). This also includes documenting practical lessons on, and any opportunities for, applying geo-referencing and geospatial data for future monitoring and evaluation purposes to partly address reporting challenges.

The evaluation questions (EQ) addressed in the sub-sector evaluation are:

EQ1: What results, including any realised or emerging impact, has Finland generated in this sub-sector during the period under evaluation? (summative)

1.1 What have been the most notable results and impacts? What relative change(s) resulted in the sub-sector through Finnish support during the period? Were there any unexpected and/or negative effects to the environment (do no harm)?

1.2 Who benefited, in what contexts, how and why (facilitating factors)?

1.3 What approaches have been particularly effective?

1.4 What has been Finland's (context-specific) added value/comparative advantage in generating the results?

EQ2: What concrete and context-specific opportunities, entry points and models are there for Finland for partnering with Finnish and local companies and economic actors within the sub-sector topic(s) in the next five years? (formative)

2.1 What type of markets, level of competition and local demand exists there for Finnish private sector funding, investments and/or solutions (products, services) in the sub-sector topic(s) in the locations assessed?

2.2 What are the foreseen gains to the Finnish companies in the short and long term? What are foreseen benefits/results from such partnerships from the point of view of advancing of Finland's development policy objectives?

2.3 What kind of concrete models/partnerships (e.g. clusters/consortia/coalitions/multi-actor part-nerships) and instruments show best promise and viability, including possible funding sources for sustainable private sector business models, for accelerating private sector engagement for Finnish private sector actors?

This report focuses on results and impacts of MFA-supported interventions from 2010 to 2024 across the Forests, Ecosystems and Biodiversity sub-sector. It draws from a purposive sample of MFA-funded projects and initiatives within the Forests, Ecosystems and Biodiversity portfolio (see Table 1). During the Inception phase a sample of interventions was identified for further analysis. The interviews pointed to some additional projects and partners which were added to the sample. The analysis of results and impacts achieved in the Forests, Ecosystems and Biodiversity sub-sector and of the Finnish private sector engagement build on that sample. Therefore, the analysis incorporates most of the Forests, Ecosystems and Biodiversity sub-sector interventions that received MFA support during 2010–2024. Forestry is by far the most prominent theme, with 78% of the interventions, mostly in the form of bilateral and regional programmes and Institutional Cooperation Instrument (ICI) projects up to 2018. Ecosystems and biodiversity are mostly addressed through unearmarked or partially earmarked grants to United Nations Environment Programme (UNEP), World Wide Fund for Nature (WWF) Finland, International Union for Conservation of Nature (IUCN) and Siemenpuu. There was only one project implemented by a Finnish company in the sample. A particular emphasis is placed on private sector engagement within the sub-sector, aiming to identify lessons learned and good practices in leveraging private sector involvement.

In terms of the main financial instruments used to fund interventions in the Forests, Ecosystems and Biodiversity sub-sector, the present evaluation identified the following instruments as the most relevant: (i) **Multilateral support**, e.g. Global Environment Facility (GEF) and United Nations (UN) agencies such as the Food and Agriculture Organization (FAO) and UNEP; (ii) **Support to civil society organisations (CSO)**, in particular through WWF Finland an Siemenpuu Foundation, among others; and (iii) **Bilateral support** to Finland's partner countries.

Cross-cutting objectives, including human rights-based approaches, gender equality and women's empowerment, and non-discrimination, were excluded from the scope of this evaluation, as they were recently addressed in the 2023 Climate Finance Evaluation.

Table 1 Moderate and intensive studies of MFA-supported projects in the Forests, Ecosystems and Biodiversity sub-sector

INTERVENTION (ACRONYM, YEARS)	INSTRUMENTS (CATEGORIES FROM TERMS OF REFERENCE)	IMPLEMENTING AGENCY AND MFA FINANCING	GEOGRAPHY	CONTEXT[1]	DEPTH OF STUDY
Interventions with main focus on forests and forest management					
Miti Mingi Maisha Bora – Support to Forestry Sector Reform (MMMB, 2007–2015)	Bilateral support	Implementer: Government of Finland Finnish contribution/total budget: EUR 22.7 million	Kenya	Traditional	Moderate study
Scaling-up Participatory Sustainable Forest Management Project (SUFORD 2003–2008), Sustainable Forestry and Rural Project Additional Financing (SUFORD-AF, 2009–2013) and Scaling-up Participatory Sustainable Forest Management Project (SUFORD-SU, 2013–2019, with Finland technical assistance funding until June 2017)	Bilateral support	Implementer: Government of Finland (technical assistance) and World Bank World Bank: USD 51.98 million Finland: USD 33.82 million Government of Laos: USD 0.43 million (data only from one phase) Total budget (3 phases): USD 86.23 million	Lao PDR	Traditional	Moderate study
Strengthening National Geographic Services in Laos (SNGS, 2010–2015)	Bilateral support	Implementer: Government of Finland Finnish contribution/total budget: EUR 6 million	Lao PDR	Traditional	Moderate study
National Forest and Beekeeping Programme (NFBKP, 2013–2015)	Bilateral support	Implementer: Government of Finland Finnish contribution/total budget: EUR 13.7 million	Tanzania	Traditional	Intensive study
Forestry and Value chains Development (FORVAC, 2018–2024)	Bilateral support	Implementer: Government of Finland Finnish contribution: EUR 14.15 million Total budget: EUR 14.35 million	Tanzania	Traditional	
Private Forestry Programme (PFP, 2014–2019) and Participatory Plantation Forestry Programme in Tanzania (PFP II, 2019–2024)	Bilateral support	Implementer: Government of Finland Finnish contribution: EUR 9.34 million Total budget: EUR 9.87 million	Tanzania	Traditional	
Tree Outgrowers Support Programme in Tanzania (TOSP, 2019–2022)	Bilateral support	Implementer: Government of Finland Finnish contribution/total budget: EUR 1.17 million	Tanzania	Traditional	
Strengthening Forest Resources Management and Enhancing its Contribution to Sustainable Development, Land use and Livelihoods (also known as “FAO-Finland Forestry Programme”) (GCP/GLO/194/MUL), 2009–2014	Multilateral support	Implementer: FAO Finnish contribution: EUR 15.25 million	Global; Ecuador, Peru, Tanzania, Vietnam and Zambia	Traditional	

1 Context. Transitions from one context to another are not always clear and consistent. Thus the MFA definition of ‘transitional’ focuses on shifting from a development cooperation-based relationship to a private sector-based relationship, while the World Bank uses per-person Gross Domestic Product and the United Nations takes a wider basket of economic and human development indicators into account. Moreover, the dynamism of national economic systems does not always make for a simple progression, an example being Zambia which the World Bank demoted from the lower-middle to lower income category in 2022. Comparable ambiguity over economic status affects the status of Lao PDR. And the ‘conflictual’ context is also subject to radical change since, as seen since 2022 in Ukraine and elsewhere, it depends on military and peace-making initiatives by various stakeholders.

INTERVENTION (ACRONYM, YEARS)	INSTRUMENTS (CATEGORIES FROM TERMS OF REFERENCE)	IMPLEMENTING AGENCY AND MFA FINANCING	GEOGRAPHY	CONTEXT[1]	DEPTH OF STUDY
National Forestry Resources Monitoring and Assessment in the United Republic of Tanzania (NAFORMA, 2009–2014)	Multilateral support	Implementer: FAO Finnish contribution: USD 5.8 million	Tanzania	Traditional	
VN/Management Information System for Forestry Sector Phase II (FORMIS II, 2013–2018)	Bilateral support	Implementer: Government of Finland Finnish contribution: EUR 9.7 million Total budget: EUR ~10.1 million	Vietnam	Transition	
Informed forestry decisions, sustainable forest management and forest certification in smallholder forests in Vietnam, Participatory Forest Governance (PFG, 2014–2018)	INGO project	Implementer: ActionAid Vietnam Finnish contribution: EUR 1.05 million ActionAid Vietnam: EUR 0.05 million Total budget: EUR 1.0946 million	Vietnam	Transition	
National Forest Resources Monitoring and Assessment (NAFORMA) at regional and local levels in Tanzania (INFORES, 2016–2019)	ICI project	Implementor: Natural Resource Institute, Finland Finnish contribution/total budget: EUR 0.7 million	Tanzania	Traditional	Moderate study
Integrated Land Use Assessment, II-phase (ILUA II, 2010–2017)	Multilateral support	Implementer: FAO Finnish contribution/total budget: USD 5.1 million	Zambia	Transition	Moderate study
Civil Society Environment Fund phase II (CSEF II, 2015–2019)	Bilateral support	Implementer: Government of Finland Finnish contribution/total budget: EUR 4.6 million	Zambia	Transition	Moderate study
Decentralised Forest and other Natural Resources Programme (DFONRMP, 2015–2018)	Bilateral support	Implementer: Government of Finland Finnish contribution/total budget: EUR 4.7 million	Zambia	Transition	Moderate study
Forest Policy and Economics Education and Research project (FOPER, 2004–2013)	Regional cooperation	Implementor: European Forest Institute Finnish contribution: EUR 6 million Total budget: EUR 6.8 million	Western Balkans	-	Moderate study
Livelihood Improvement through Generation and Ownership of Forest Information by Local People in Products and Services Markets project in the Mekong basin (FORINFO, 2011–2015)	Regional cooperation	Implementer: Regional Community Forestry Training Centre for Asia and the Pacific, RECOFTC Finnish contribution: EUR 3.8 million	Mekong, Regional	-	Moderate study
Sustainable Forest Management Programme in the Andean region (MFS, 2011–2016)	Regional cooperation	Implementer: Inter-American Institute for Agriculture, IICA Finnish contribution: EUR 8.08 million	Andean region	-	Moderate study
Integrated Environmental and Forest Management Co-operation Project in Central America (FINNFOR II 2012–2016)	Regional cooperation	Implementer: Tropical Agricultural Research and Higher Education Centre, CATIE Finnish contribution: EUR 2 million	Central America	-	Moderate study

INTERVENTION (ACRONYM, YEARS)	INSTRUMENTS (CATEGORIES FROM TERMS OF REFERENCE)	IMPLEMENTING AGENCY AND MFA FINANCING	GEOGRAPHY	CONTEXT[1]	DEPTH OF STUDY
Support to Implementation of the Forest Policy and Strategy in Kosovo (GCP/KOS/005/FIN), 2011–2017	Multilateral support	Implementer: FAO Finnish contribution/Total budget: EUR 4 million	Kosovo	-	Moderate study
FAO: Enhancing accuracy, accessibility and transparency of global forest resources data (GCP/GLO/1030/MUL), 2022–2023	Multilateral support	Implementer: FAO Finnish contribution: USD 2.3 million Total budget: USD 7 million	Global	-	Moderate study
FAO: Forest and Farm Facility (GCP/GLO/931/MUL) (2012–2025)	Multilateral support	Implementer: FAO Finnish contribution: USD 5 million (Phase I) and USD 2.37 million (Phase II) Total budget: USD 83.8 million (for both Phases)	Global	-	Moderate study
Interventions with main focus on ecosystems and biodiversity					
Regional Biodiversity Programme for the Amazon Region of Andean Countries (BioCAN 2010–2013)	Regional cooperation	Implementer: General Secretariat of the Andean Community Finnish contribution: EUR 6.28 million	Andean region, Regional	-	Moderate study
UNEP Nature Fund ('Living in Harmony with Nature') 2023–2025	Multilateral support	Implementer: UNEP Finnish contribution: USD 3.3 million The UNEP Nature Fund has received USD 8.43 million, mainly from Norway (58%) and Finland (39%).	Global	-	Moderate study
World Wildlife Fund (WWF) Finland multiyear development programmes, 2014–2025	CSO support	Implementer: WWF Finland Finnish contribution EUR 12 million during 2021–2025	Global	-	Moderate study
Siemenpuu multiyear development programmes, 2015–2025	CSO support	Implementer: Siemenpuu Foundation Finnish contribution EUR 4 million during 2021–2025	Global	-	Moderate study
IUCN-Finland Framework agreement, 2010–2025	Multilateral support	Implementer: IUCN Finnish contribution EUR 2.8 million during 2021–2024 Total budget: 633 million Swiss Franc	Global	-	Moderate study
Global Environment Facility, GEF replenishments GEF-7 and GEF-8, 1994–2026	Multilateral support	Implementer: GEF Finnish contribution for biodiversity EUR 24.4 million during 2019–2026	Global	-	Moderate study
Zambia ProMs Partnership (ZAPROPA), 2023–2024	Private sector instrument	Implementer: Arbonaut Oy Finnish contribution: EUR 0.03 million Total budget: EUR 0.04 million	Zambia	Transition	Moderate study

2.2 Approach and methods

The methodology is described in detail in Annex 1. It is focused on: (i) exploring beyond the project and programme level to shed light on aggregate and catalytic effects and synergies between actions, actors, instruments and policy-influencing activities within and across the sub-sector; and (ii) establishing how these encourage and enable wider changes at geographic, sectoral and/or institutional scales, including the role of private sector engagement and implications for the portfolio and policy level. It is therefore a 'theory-based', 'macro-level' and 'realist' evaluation:

- **theory-based**, because it is built upon a theory of change for the sub-sector that indicates the logical connections between inputs and instruments, short-, medium- and long-range results, and impacts, and hence with an emphasis on the plausibility of assumptions and causal links between steps in the design logic;
- **macro-level,** because it is focused on development cooperation across multiple interventions, locations, and the 15 years 2010–2024; and
- **realist,** because the study is embedded within a theory of change grounded in the large-scale, long-term development context that applies to those same multiple interventions, locations, and years.

This focus on the macro level differentiates the approach from that of micro-level or intervention-specific evaluation. It rules out applying a detailed understanding of local context to help understand patterns and themes, since contexts cannot be aggregated but only generalised or used in examples. For the same reasons, the key Organisation for Economic Co-operation and Development (OECD) Development Assistance Committee's evaluation criteria of effectiveness, impact and sustainability have different meanings compared with their uses in intervention-specific evaluation[2]. In the present **macro-level context** they are defined as follows:

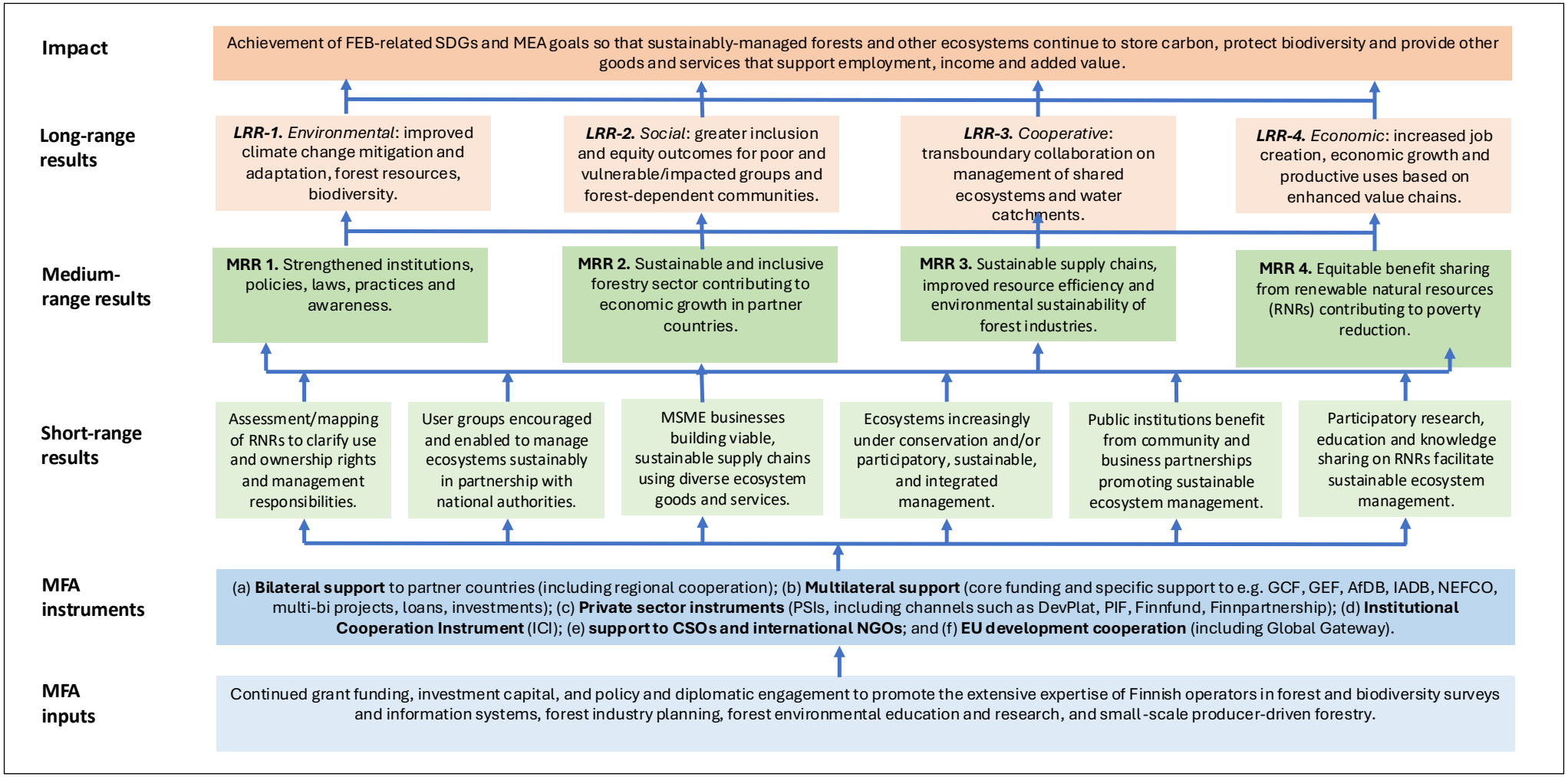
- **effectiveness** refers to the specific changes that occurred in a system during and as a result of particular kinds of MFA-supported interventions;
- **impact** refers to the consequences of those specific changes for the system with which particular kinds of MFA-supported interventions were engaged; and
- **sustainability** refers to the development of new outlooks, abilities, laws, budgets or administrative arrangements that are likely to promote the durability of those specific system changes after MFA's eventual departure.

The sub-sectoral theory of change

The above makes clear that the sub-sectoral theory of change is of central importance to this evaluation, since performance across the portfolio is to be judged in terms of changes in line with the theory of change and that contribute to the flow of results from short, medium and long-range to overall effects on achieving the SDGs and related objectives. An early step in the evaluation was therefore to develop a sub-sectoral theory of change (Figure 1) based on MFA's existing theory of change and aggregate indicators for the Environment and Natural Resources policy area (2023) Outcome 1 "All people benefit increasingly from clean environment and healthy ecosystems, conservation, sustainable management and use of renewable natural resources, such as forests and water bodies", modified in light of relevant ecological principles and global good practice (such as those developed to meet relevant SDG targets in this sub-sector, including SDGs 12.2, 15.1, 15.2, 15.3, 15.5, and also 6.5, 13.1, 13.3, 15.9), and supported by theory of change assumptions listed in Annex 1.

2 At the micro level, effectiveness refers to the delivery of results by an intervention, impact refers to the consequences of the results during the project, and sustainability refers to durable change induced by the project and likely to survive it.

Figure 1 Theory of Change for the Forests, Ecosystems and Biodiversity sub-sector



Source: Evaluation team, based on the theory of change and aggregate indicators for the Environment and Natural Resources policy area in MFA (2023)

A mixed-methods evaluation

A mixed-methods design was adopted, tailored to each EQ. The core methods used in each sub-sector evaluation included:

- **Portfolio review:** Mapping and screening MFA-funded interventions in the Forests, Ecosystems and Biodiversity sector (2015–2022), leading to the pre-selection of a wide sample of projects to be considered for assessment.
- **Desk studies:** Moderate and intensive reviews of project and programme documentation, including final and ex-post evaluations. Evidence was systematically captured into searchable proformas (project results frameworks presented in Table 7 and Table 8) where it could be easily retrieved at any stage and by the entire evaluation team. A total of 30 interventions were reviewed in the Forests, Ecosystems and Biodiversity sub-sector, of which eight were studied in greater depth through intensive studies (see Table 1). Cutting across the sub-sectors, intensive reviews of four private sector engagement instruments were also included.
- **Interviews and survey:** Conducted with a total of 67 informants: 31 policy-level, 25 intervention level, 6 private sector, and other knowledge-holders (see Annex 9 for more details) to complement desk review findings, clarify gaps, and explore strategic and operational aspects, including private sector engagement. Cutting across the sub-sectors, 19 companies responded to a private sector engagement survey, and approximately half a dozen overall Environment and Natural Resources management interviewees from public and private sectors provided information and insights relevant to Forests, Ecosystems and Biodiversity.
- **Market analysis:** Market analyses focusing on opportunities for Finnish companies were conducted relating to the interventions covered by the intensive studies in each sub-sector. Thus, in the case of Forests, Ecosystems and Biodiversity, the two market analyses focused on Forest Information Systems and Adjacent Sectors in Tanzania and Vietnam (Annex 6 and 7). This component drew on interviews, desk studies, and additional data sources to assess private sector engagement trends, barriers, and opportunities within the sub-sector.
- **Like-minded peer country review:** Examined strategies, instruments, and delivery models used by comparator countries engage in activities in the same sub-sector. The analysis aimed to identify lessons and contrasts with Finland's approach, including areas of innovation and convergence. In addition, cutting across the sub-sectors two like-minded peer country reviews focusing on engaging private sector were carried out.
- **Natural language processing:** Used to efficiently identify the most relevant sources of information for the sub-sector from a large volume of evaluation reports and documentation, especially during the inception phase.
- **Geospatial analysis:** Used in the forestry sub-sector to visualise and interpret the spatial dimensions of project implementation and impact in Tanzania. See Annex 4 and Annex 5 for full details.
- **In-country consultations:** Conducted in Vietnam (a transitional context) and Tanzania (a traditional context) to validate findings, deepen analysis on clusters of interventions, and examine their private sector engagement relevance. Based on the distribution of different themes of MFA investment by country and partner as shown in the portfolio review, Vietnam and Tanzania were selected for in-country consultations that were conducted by national experts. Also considering the potential for Finnish private sector engagement to enter those markets, the objectives of the studies were to assess interest in and demand for digital forest resource data and digital tools for managing those data, among forest managers, together with looking at impacts of past interventions on these topics.

Together, these methods enabled the evaluation team to triangulate evidence across a wide range of sources, ensuring that conclusions are robust and grounded in multiple lines of inquiry.

Consistency and comparability

All four sub-sector reports addressed the same EQs and contributed to the preparation of the synthesis report. To ensure comparability and enable aggregation across sub-sectors, all performance judgements (i.e. on effectiveness, impact and sustainability) were required to be evidence-based and expressed in a standardised manner by using the following three-point scale as qualifiers where appropriate:

- **Strong performance** – Finnish support was assessed as being successful in achieving most (if not all) of its expected results, made a significant contribution to broader effects or impacts (i.e. through Finnish added value) and benefitted a substantial part of the intended target populations;
- **Moderate performance** – Finnish support was assessed at being successful or at least partially successful in achieving several (but not all) of its expected results, contributed to broader effects or impacts (but only to a limited degree while the contribution of others is likely to have been more significant) and benefitted the intended target populations;
- **Weak performance** – Finnish support only achieved a small proportion of its expected results, did likely not contribute to broader effects or impacts (or only in a very limited and indirect manner) and did not manage to create any wider benefits for the intended target populations.

The adoption of this limited range reflected the nature of the evidence available across the sub-sector portfolio, which did not support more granular distinctions. The same approach was applied across all the sub-sector evaluations to ensure coherence in synthesis. Throughout the reports, these assessments are put into context by a 'realist perspective' offering insights on the circumstances and conditions in which Finland carried out its activities. In addition, further explanation is provided where needed to clarify specific cases or examples used as evidence, in particular where those might provide counterexamples and exceptions to the overall assessment, although these additional descriptive terms informed the evidence base rather than the formal findings.

The subject of the evaluation (and of each sub-sector) being particularly complex and broad, there is a wide range of variables and factors that impact on outcomes and broader effects. Therefore, the evaluation aims at providing evidence for **Finnish contribution** to these effects, rather than seeking to establish direct claims of attribution. As a significant amount of Finnish funding is going through multilaterals, international organisations and other partners, it is not possible to claim any effects as direct results of Finnish support. Finland's share can, in fact, be relatively small, and – wherever feasible – the evaluation attempts to specify the (likely) weight of Finnish contribution in given contexts.

For consistency, **beneficiaries** were defined as individuals and institutions who could reasonably be considered to have received some form of benefit from an action funded wholly or in part by the MFA. Benefits and beneficiaries are discussed in the findings in Chapter 4.

3 Context Analysis

3.1 Global policy context and trends

Most global indicators confirm a steady decline in the structure and condition of natural ecosystems since 1970, with an estimated deterioration of at least 1% per decade (IPBES, 2019). Forests, which host the majority of Earth's terrestrial biodiversity, are at the centre of this crisis, and the conservation of global biodiversity depends critically on how societies use and manage forest resources. The biodiversity found in forests varies significantly according to forest type, geography, climate, soils, and the intensity of human use (FAO and UNEP, 2020).

For terrestrial and freshwater ecosystems more broadly, land-use change – primarily agricultural expansion – has exerted the most damaging impact and continues to be the leading driver of deforestation, forest fragmentation and associated biodiversity loss (IPBES, 2019; FAO and UNEP, 2020). Recent scientific evidence indicates that over 80% of tropical deforestation is linked to agriculture, including livestock production (Pendrill et al., 2022). This is followed by the direct exploitation of plants, animals and other organisms through harvesting, logging, hunting and fishing (FAO and UNEP, 2020). Since 1990, an estimated 420 million hectares (ha) of forest have been converted to other land uses, with deforestation and forest degradation continuing at rates that contribute significantly to the ongoing loss of biodiversity (IPBES, 2019; FAO and UNEP, 2020).

In the last decades, there has been some progress towards slowing global forest loss, as the annual rate of net forest area decline decreased from an average of 7.8 million ha in the 1990s to 4.7 million ha between 2010 and 2020 (Table 2).

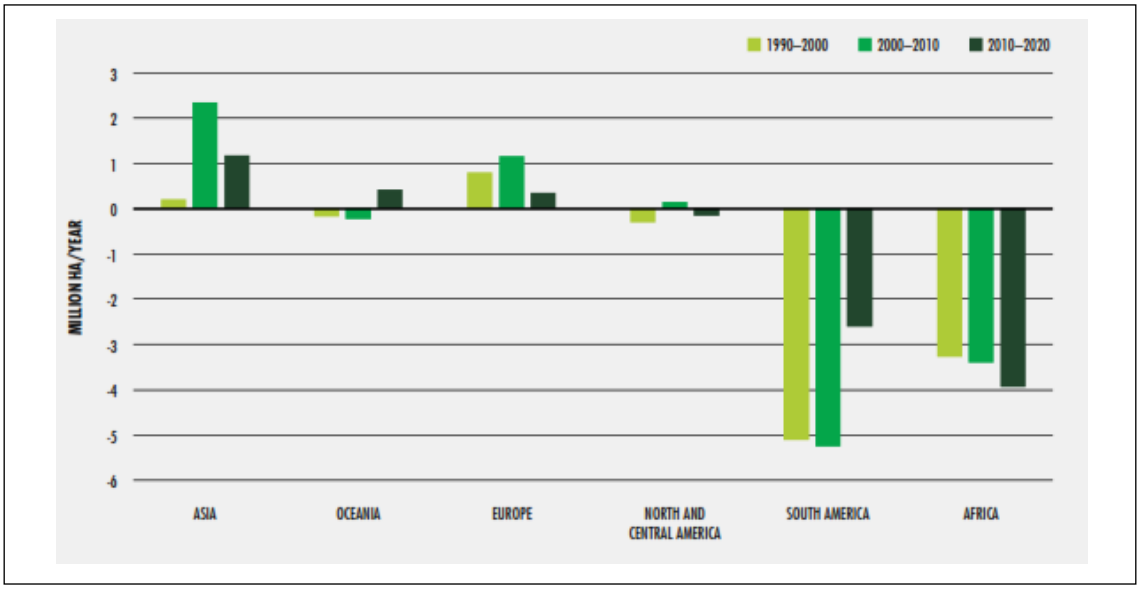
Table 2 Annual rate of forest area change

PERIOD	NET CHANGE (MILLION HA/YEAR)	NET CHANGE RATE (%/YEAR)
1990–2000	-7.84	-0.19
2000–2010	-5.17	-0.13
2010–2020	-4.74	-0.06

Source: FAO and UNEP, 2020

The progress has not been equal across regions and over the decades (Figure 2). Asia and Europe recorded consistent net gains over periods, with the strongest increase recorded in Asia between 2000 and 2010 (over 2 million ha per year), though growth slowed somewhat in the following decade. On the contrary, South America and Africa continued to face large-scale net deforestation throughout the three decades. South America showed the steepest declines between 1990 and 2010. While the global trend has generally been positive in terms of halting the loss of forest cover, Africa experienced intensifying net deforestation in 2010–2020. Nevertheless, the world remains off track to meet the United Nations Strategic Plan for Forests target of increasing global forest area by 3% by 2030 relative to 2015 (FAO and UNEP, 2020).

Figure 2 Net forest area change by region, 1990–2020 (million ha per year)



Source: FAO. 2020. Global Forest Resources Assessment 2020 – Main report. Rome.

The global policy architecture guiding Forests, Ecosystems and Biodiversity has expanded considerably over the past two decades, though implementation has lagged behind commitments (most relevant international frameworks, agreements and initiatives relevant to the Forests, Ecosystems and Biodiversity sub-sector are laid out in Annex 2). At the centre of this framework are the Sustainable Development Goals (SDGs), in particular SDG 15 on Life on Land, SDG 13 on Climate Action, and SDG 12 on Responsible Consumption and Production (UN, 2015).

Within the Convention on Biological Diversity, the Strategic Plan for Biodiversity (2011–2020) and its Aichi Targets provided a comprehensive set of international biodiversity goals (CBD, n.d.), succeeded in 2022 by the Kunming–Montreal Global Biodiversity Framework (Global Biodiversity Framework). The Global Biodiversity Framework sets 23 global targets to 2030, including the "30x30" commitment to protect 30% of terrestrial and marine areas, and four long-term goals aimed at living in harmony with nature by 2050 (CBD, 2022). The Global Biodiversity Framework also explicitly recognises the role of women, youth, indigenous peoples and local communities, civil society organisations, the private and financial sectors, and stakeholders from all other sectors in advancing sustainable forest and ecosystem management. In 2024, this was further reinforced by the World Coalition for Peace with Nature: Call for Life, which echoed the UN Secretary-General's warning of a global "war on nature" and framed "making peace with nature" as a defining task of the 21st century (CBD, 2024; UNFCCC, 2020).

Forests are specifically addressed through the United Nations Forum on Forests and its UN Forest Instrument and Strategic Plan for Forests 2030, which define Global Forest Goals focused on sustainable forest management, forest protection, and increasing forest cover by 2030 (UNFF, 2019). The UN Framework Convention on Climate Change (UNFCCC) Paris Agreement embeds forests into climate strategies, notably through REDD+ (Reducing Emissions from Deforestation and Forest Degradation, and the role of conservation, sustainable management of forests, and enhancement of forest carbon stocks in developing countries), which provides a mechanism for countries to reduce emissions from deforestation and forest degradation while promoting conservation and sustainable management (UNFCCC, n.d.). The United Nations Convention to Combat

Desertification complements these commitments by advancing Land Degradation Neutrality targets (UNCCD, n.d.).

Additional layers of governance are provided by biodiversity-related conventions, including the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES, 1973), the Convention on the Conservation of Migratory Species (CMS, n.d.), the International Treaty on Plant Genetic Resources for Food and Agriculture (FAO, 2001), the Ramsar Convention on the Conservation of Wetlands (IUCN, 1989), the World Heritage Convention (UNESCO, 1972), and the International Plant Protection Convention (UN, 1951). Each provides thematic tools relevant to Forests, Ecosystems and Biodiversity, from trade restrictions to habitat conservation and genetic resource management.

Finally, a series of global and political commitments underscore the urgency of forest and ecosystem action: the UN Decade on Ecosystem Restoration 2021–2030 (UN, 2019), the Bonn Challenge (n.d.) to restore 350 million ha of degraded land by 2030, the Glasgow Leaders' Declaration on Forests and Land Use signed by over 140 leaders covering 90% of the world's forests (UNCC, 2021), and the Global Forest Finance Pledge of USD 12 billion in public climate finance to 2025 (UNCC and UK Government, 2021). Together, these frameworks and initiatives form an extensive policy architecture for halting deforestation, restoring ecosystems, and safeguarding biodiversity, even if the aggregate picture of progress remains uneven.

While the architecture is robust, delivery has often fallen short of stated ambitions. Mechanisms for financing and operationalising the global frameworks have become increasingly central. The Global Environment Facility (GEF), as the financial mechanism for the Convention on Biological Diversity and five other Multilateral Environmental Agreements (as of mid-2024), has long supported biodiversity and forest initiatives through project finance and capacity building, and since 2023 manages the Global Biodiversity Framework Fund to channel resources directly towards Global Biodiversity Framework implementation (GEF, 2023). In parallel, the Green Climate Fund under the UNFCCC provides the largest multilateral climate financing window, supporting ecosystem-based adaptation and REDD+ results-based payments, which link verified emission reductions from deforestation and forest degradation to financial incentives for participating countries (GCF, 2024).

At the market and regulatory level, pressure is rising. The European Union (EU) Deforestation Regulation requires geolocation data for commodities such as palm oil, soy, beef, cocoa and coffee, obliging companies to ensure deforestation-free supply chains by 2025 (EU, 2023). These private-sector compliance incentives are hoped to effectively translate global goals into verifiable delivery standards (Sarmiento, 2025).

The EU Global Gateway further supports implementation by mobilising public and private finance towards green, resilient and deforestation-free value chains. Through Forest Partnerships and Team Europe Initiatives, it funds jurisdictional approaches, protected-area systems, agroforestry and community-based transitions (European Commission, 2022a; 2022b). It also provides technical assistance for supply chains such as cocoa and coffee, supports smallholders in meeting traceability requirements, and mainstreams nature-based solutions in wider infrastructure pipelines with blended finance.

In addition, voluntary and political pledges such as the New York Declaration on Forests (UNCC, 2014), the Bonn Challenge (n.d.), and the Glasgow Leaders' Declaration (UNCC, 2021) continue to mobilise governments, civil society and the private sector. These initiatives help bridge the implementation gap by fostering coalitions and increasing accountability, even if they remain non-binding.

Taken together, these mechanisms illustrate how the high-level commitments of Multilateral Environmental Agreements, SDGs and international declarations are translated into operational action. The interplay of multilateral funds (GEF, Green Climate Fund), regulatory drivers (EU Deforestation Regulation), and strategic investment platforms (Global Gateway, Team Europe Initiatives) increasingly shapes the way Forests, Ecosystems and Biodiversity goals are delivered in practice. Yet, as noted in the trends analysis, progress remains insufficient: global deforestation continues, biodiversity indicators are deteriorating, and the 2030 goals under the Global Biodiversity Framework, SDGs and the UN Strategic Plan for Forests are not yet on track (European Commission, 2024; Forest Declaration Assessment Partners, 2024; UN, 2024).

3.2 Finnish policy and institutional context

Finland's development cooperation has long emphasised sustainability and the environment, with forests occupying a prominent place in policy since the early 1990s (see Annex 3 for more details). The 2013 Development Policy Guidelines for the Forest Sector (MFA, 2013) defined Finland's Forests, Ecosystems and Biodiversity priorities as strengthening forest data and monitoring systems, building institutional capacity, and improving governance for sustainable forest management. These principles remain visible across the portfolio, with interventions that emphasise participatory systems, gender equality, and rights-based approaches reflecting both domestic values and international standards. Finland has also promoted the integration of sustainable forestry and biodiversity conservation with economic development, for example through support for small and medium-sized enterprises in forest-based value chains, and by encouraging public–private partnerships in ecosystem services and biological resource management (MFA, 2013; Development Policy Committee, 2016). The current Government Programme (Government of Finland, 2023) states that Finland is committed to supporting sustainable forestry and afforestation projects and to strengthening the global carbon sink – drawing on Finnish expertise. The link between climate change, biodiversity, pollution and security is also recognised in Finland's foreign and security policy, which identifies climate change and environmental degradation as drivers of instability (Government of Finland, 2024a). Forests, Ecosystems and Biodiversity cooperation therefore carries a dual function: advancing climate and biodiversity goals while also supporting conflict prevention, disaster-risk reduction, and societal resilience consistent with Finland's comprehensive security approach.

Finland's policies are consistent with international commitments, including the Convention on Biological Diversity and its Kunming–Montreal Global Biodiversity Framework, the UNFCCC and Paris Agreement (including REDD+). Finland is a member of the High Ambition Coalition for Nature and People advancing the 30x30 target, and it signed the Glasgow Leaders' Declaration on Forests and Land Use committing to halt and reverse forest loss by 2030. Forests, Ecosystems and Biodiversity cooperation also aligns with the UN Strategic Plan for Forests (2017–2030) and its Global Forest Goals. Finnish Forests, Ecosystems and Biodiversity interventions have thus been in line with global priorities of achieving sustainable forest management, reducing deforestation, and mitigating climate change. For example, Finland's work on forest management information systems has responded to needs articulated by the Collaborative Partnership on Forests and the Committee on Forestry. Climate change mitigation and adaptation became more prominent following the Paris Agreement, and Forests, Ecosystems and Biodiversity cooperation contributes directly to SDG 15 (Life on Land), SDG 13 (Climate Action) and SDG 12 (Responsible Consumption and Production).

Finland's Forests, Ecosystems and Biodiversity policies are also embedded in broader climate and environmental diplomacy. By aligning with EU decisions and international agreements, Finland seeks to promote the transition to climate-resilient, low-carbon societies that protect biodiversity. This includes prioritising support to least-developed countries and Small Island Developing States in climate change mitigation, adaptation, and biodiversity protection, as well as generating demand for Finnish environmental and forestry technology in partner countries. (MFA, n.d.-a).

The overall scale of Finnish official development assistance (ODA) has historically been and remains modest. In 2025, its share of gross national income is 0.36% (MFA, n.d.-b), well below the international 0.7% commitment. Comparative analyses show that Finland's share of ODA allocated to biodiversity is among the lowest in the Nordic region – 0.5% in 2020, compared to 7.9% in Norway, 4.2% in Sweden, and 1% in Denmark (WWF Finland, 2022a). Both the Development Policy Committee (DPC, 2021) and OECD Development Assistance Committee peer reviews (2017, 2024) have urged Finland to increase biodiversity finance and mainstream biodiversity more effectively across its development cooperation.

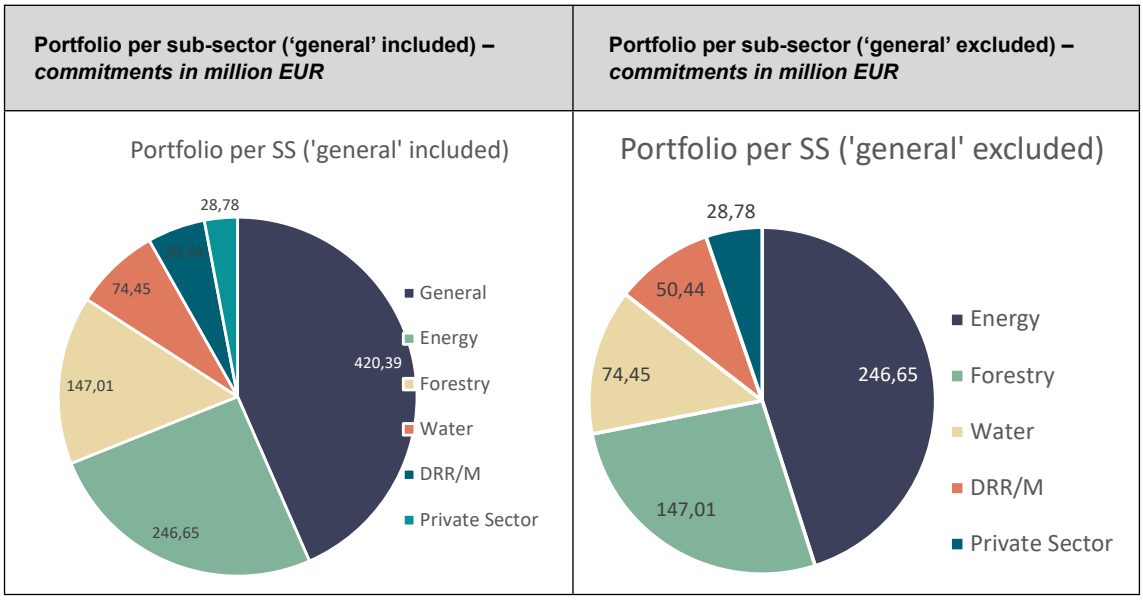
Finnish Forests, Ecosystems and Biodiversity support is channelled through a mix of bilateral projects, multilateral contributions, and partnerships with civil society. Bilaterally, Finland has a long legacy of forestry programmes in Africa and Asia, although these have diminished in recent years as budget cuts reduced the scope of direct interventions. Biodiversity and ecosystem funding is now channelled primarily through multilateral institutions, notably the GEF, which is the main financing mechanism of the Convention on Biological Diversity/Global Biodiversity Framework, and the Green Climate Fund, which supports climate–forest linkages through REDD+ and ecosystem-based adaptation. Targeted contributions to organisations such as UNEP and IUCN further strengthen international cooperation on biodiversity and ecosystems. CSOs remain important partners as well. The Siemenpuu Foundation and WWF Finland, for instance, implement projects on community forestry, biodiversity conservation, and climate resilience, often complementing multilateral and bilateral efforts. These channels ensure that Finnish cooperation is directly linked to the Convention on Biological Diversity/Global Biodiversity Framework, UNFCCC/Paris Agreement and REDD+, and the United Nations Convention to Combat Desertification Land Degradation Neutrality framework.

At the regional and global level, Finnish cooperation also connects to EU joint initiatives. Participation in Team Europe Initiatives under the Global Gateway allows Finland to align with large-scale, multi-country investments in sustainable landscapes and biodiversity. One example is the Team Europe Green Initiative in Partnership with the Association of Southeast Asian Nations (ASEAN)/ South-East Asia, which covers biodiversity and sustainable landscapes alongside green cities, sustainable food systems, clean energy, and circular economy transitions. This positioning enables Finland to contribute indirectly to jurisdictional approaches, deforestation-free value chains, and nature-based solutions that support the Global Biodiversity Framework and respond to regulatory drivers such as the EU Deforestation Regulation.

3.3 Portfolio review

Quantitative portfolio data of ODA commitments in the Environment and Natural Resources policy priority area in 2015–2022, that was made available to the evaluation, indicate a total commitment of EUR 967.72 million.[3] The Forests, Ecosystems and Biodiversity sub-sector was the second largest sub-sector within the overall Environment and Natural Resources portfolio under review, with commitments at EUR 147 million. This translates to 15% of the total Environment and Natural Resources commitments during the period ('general'[4] included). The evaluation identified 70 interventions with funding commitments to Forests, Ecosystems and Biodiversity sector during the period. These data were used to demonstrate the relative size (in percent of the total) of MFA investments within the sub-sector as displayed in Figure 3.

Figure 3 Forests, Ecosystems and Biodiversity portfolio share from Environment and Natural Resources portfolio (commitments, EUR million)



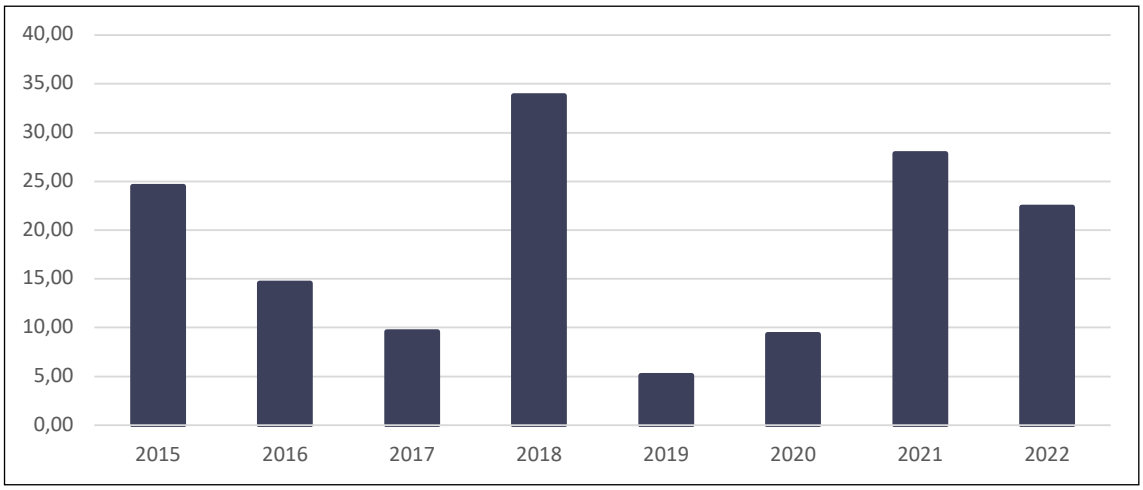
Source: MFA/evaluation team

Forests, Ecosystems and Biodiversity commitments were highly volatile across the years, with peaks in 2018, 2021, and 2022, and a clear low in 2019 (Figure 4).

3 Finland's exclusive ODA budget is administered by the MFA and excludes Finnfund investments.

4 'General' refers to funding within the Environment and Natural Resources portfolio which is not directed to a specific sub-sector.

Figure 4 Forests, Ecosystems and Biodiversity commitments in 2015–2022 (EUR million)



Source: MFA/evaluation team

The distribution of the portfolio is split almost evenly between forestry and biodiversity-related interventions (Table 3).

Table 3 Forests, Ecosystems and Biodiversity commitments (2015–2022)

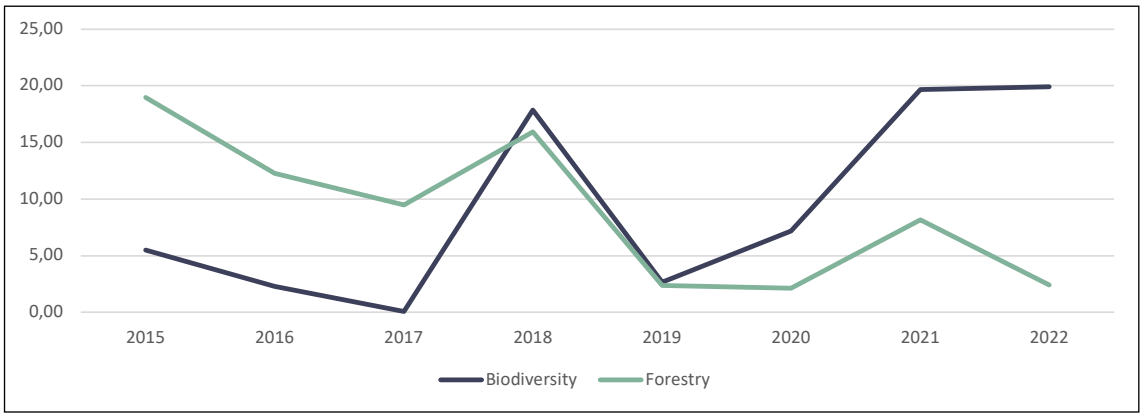
CATEGORY	COMMITMENTS (IN EUR MILLION)	PERCENTAGE
Forestry	71.80	49%
Ecosystems and Biodiversity	75.21	51%
Grand Total	147.01	100%

Source: MFA/evaluation team

Figure 5 illustrates that forestry commitments were strongest in the earlier years, particularly 2015 (EUR 18.96 million), 2016 (EUR 12.26 million), and 2018 (EUR 15.93 million). After 2018, forestry support dropped sharply, with very low allocations from 2019 onward. By 2022, commitments to forestry stood at just EUR 2.43 million, reflecting a structural decline in emphasis on forestry as a funding priority.

Biodiversity funding, in contrast, gained significant ground after 2018. Following a strong increase in 2018 (EUR 17.88 million), biodiversity commitments continued at higher levels, reaching EUR 19.68 million in 2021 and EUR 19.93 million in 2022. This indicates a clear upward trend and a shift in emphasis within the portfolio from forestry to biodiversity in the latter half of the period.

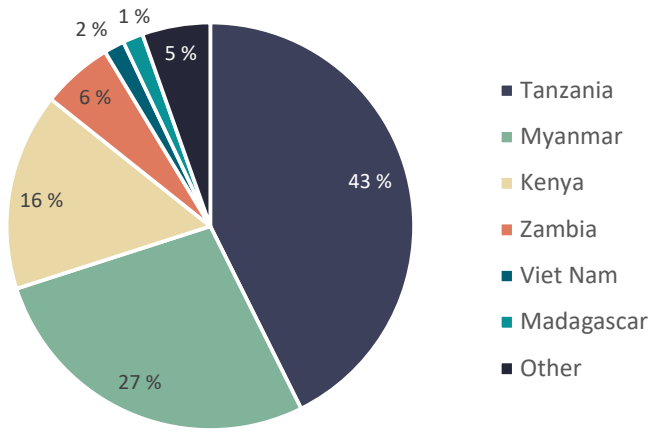
Figure 5 Trends in commitments to biodiversity and forestry related interventions (EUR million)



Source: MFA/evaluation team

Country specific ODA commitments in the sub-sector represent 42% of all commitments made (EUR 62.42 million). Figure 6 presents the distribution of the Forests, Ecosystems and Biodiversity portfolio across different countries (not taking into account regional commitments dedicated to multiple countries). Tanzania stands out as holding the largest share of the commitments. Myanmar and Kenya hold the second and third largest share, followed by Zambia. Notably, most of the country-specific portfolio is allocated to African countries.

Figure 6 Forests, Ecosystems and Biodiversity portfolio per country (%)



* Category "Other" includes country-specific commitments < EUR 1 million.

* Myanmar: The commitment to Myanmar includes EUR 8 million for National Forest Inventory and National Forest Monitoring Systems. Start-up of the project was delayed, and it was cancelled after the military coup in 2021. The other commitments were for an ICI project and a project implemented by UN Office on Drugs and Crime.

* Kenya: The commitment includes EUR 9.5 million for Private Forestry and Forest Enterprise Support in Kenya. Changing circumstances led Finland to cancel this project in 2018 (Laaksonen et al., 2021).

Source: MFA/evaluation team

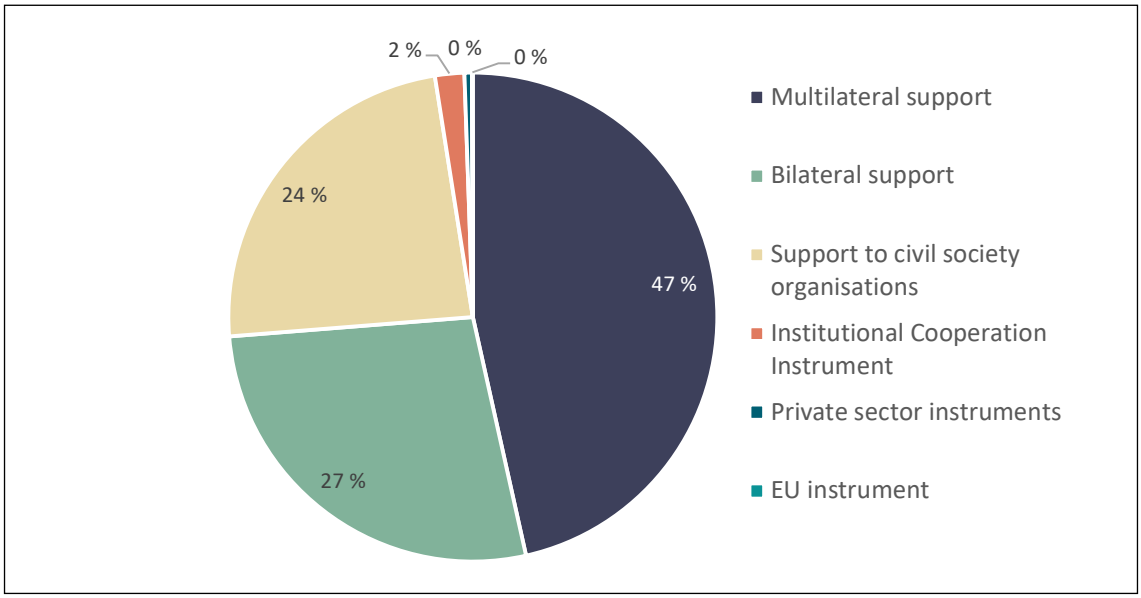
Figure 7 illustrates the distribution of the Forests, Ecosystems and Biodiversity portfolio by instrument. The main instruments through which Finnish support to Forests, Ecosystems and Biodiversity has been channelled are multilaterals, civil society and bilateral support. The former having the

biggest share (47%), followed by bilateral support (27%) and support to CSOs (24%). Very little of the commitments were channelled through private sector instruments.[5]

It should be noted that Finland's share of EU ODA is only visible as its total amount in the Finnish ODA statistics, and therefore it is not possible to determine how much of the Finnish contribution to the EU budget has been allocated to the sub-sector.[6] In the Forests, Ecosystems and Biodiversity portfolio data, one Global Gateway initiative, namely "Colombia Team Europe Initiative Forests for Biodiversity Climate and Peace (EUTF)" (EUR 0.09 million) appeared in the portfolio data. This was recorded under 'EU instrument'.

The instruments used to support interventions in the Forests, Ecosystems and Biodiversity sub-sector have changed during the period of review: in the early 2010s bilateral forestry projects formed a majority both in terms of financing volume and number of interventions. In 2020s the multilateral and intergovernmental partners and CSOs working on ecosystems and biodiversity channel 65% of the financing.

Figure 7 Forests, Ecosystems and Biodiversity portfolio by instrument (%)



Source: MFA/evaluation team

When looking at the trend in instrument use (Figure 8), it became evident that bilateral support used to be prominent but diminished over the years. In 2015, bilateral commitments stood at EUR 14.63 million, representing the largest share of the portfolio, but by 2022 no new bilateral commitments were made. This decline indicates a reduction in bilateral and regional projects. At present, the Forestry, Land Use and Value chain Development project (FORLAND) is the only bilateral forestry programme supported by the MFA.[7]

5 Finland's exclusive ODA budget is administered by the MFA and excludes Finnfund investments.

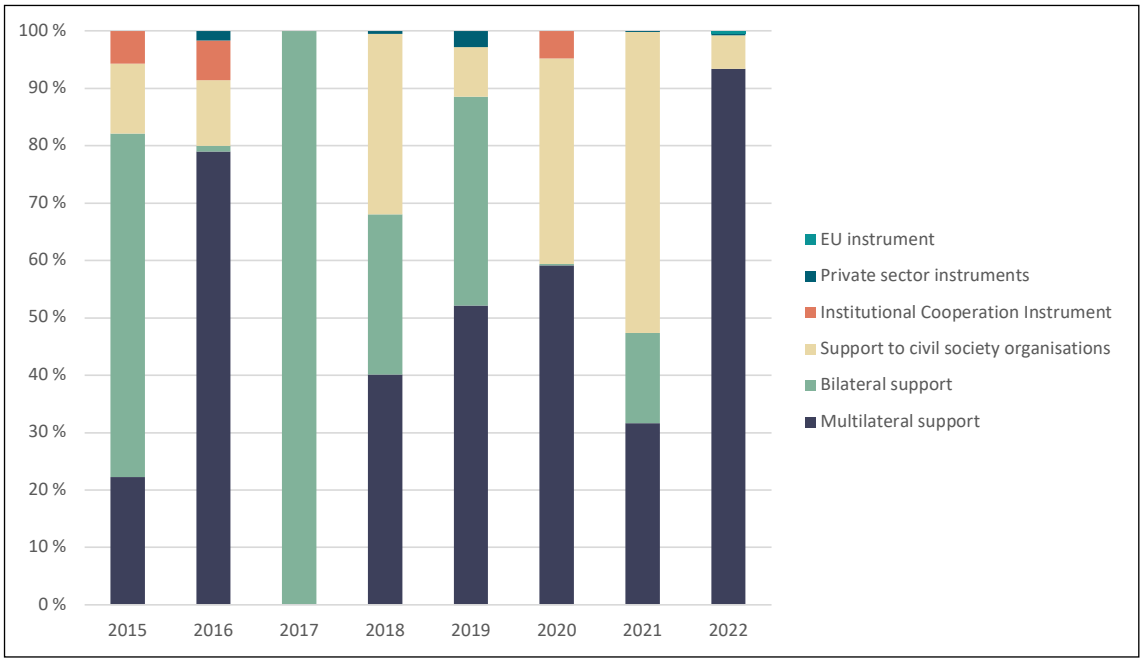
6 See, for instance, https://openaid.fi/en?budget_line=2430663

7 Commitments to FORLAND were made after 2022 and that's why it does not show int the portfolio analysis.

By contrast, multilateral support has been growing strongly, increasing by around 280% from EUR 5.45 million in 2015 to EUR 20.88 million in 2022. Multilateral instruments have consistently held the largest share of the portfolio since 2016, except in 2021, when support to CSOs peaked at EUR 14.60 million. This shift illustrates a rebalancing away from bilateral channels towards multilateral partnerships as the preferred modality for forestry support. CSO support has remained a significant element of the portfolio.

The Institutional Cooperation Instrument (ICI) has played only a marginal role, appearing in 2015, 2016 and 2020, with modest volumes. Likewise, private sector instruments other than Finnfund remain negligible, with small climate change adaptation allocations (EUR 0.25 million in 2016, EUR 0.19 million in 2018, EUR 0.14 million in 2019, and minimal amounts thereafter). While not part of this portfolio analysis because Finland's exclusive ODA budget analysed in this portfolio review is administered by the MFA and excludes Finnfund investments, Finnfund data shows, that Finnfund's commitments in 2015–2023[8] to forestry-sector were 112 million EUR.

Figure 8 Use of instruments over time in Forests, Ecosystems and Biodiversity (%)



Source: MFA/evaluation team

As described in Section 1.2 and Annex 1, the proforma technique was applied to selected past (since 2010) and ongoing (in 2025) interventions in the Forests, Ecosystems and Biodiversity sub-sector. Table 4 presents four distinct strategies of engagement that emerged from the proforma review. Each has a descriptive statement of its theme, a thumbnail portrait of its strategy, a note on how it relates to the sub-sectoral theory of change, and a list of the unique cases that were judged to be following that strategy.

8 Finnfund data is available for the period 2015-2023.

Table 4 Themes and strategies of MFA support in the Forests, Ecosystems and Biodiversity sub-sector

THEME 1: FOREST DATA AND MEASUREMENT-REPORTING-VERIFICATION SYSTEMS
Strategy: Build and institutionalise national forest information systems; finance multi-purpose National Forest Inventories and Measurement-Reporting-Verification capacity so governments manage forests on reliable, interoperable data and meet climate reporting needs.
Links to theory of change: Connects short-range results (forest management information systems) to medium-range results (evidence-based planning and credible baselines) further to long-range results (access to results-based finance and stronger compliance).
Cases: Vietnam FORMIS I–II; FAO Open Foris/Forest Resources Assessment online reporting; Tanzania NAFORMA; Tanzania INFORES with National Carbon Monitoring Centre/Sokoine University; Ecuador multi-purpose national forest inventory; Kosovo Forest Information System.

THEME 2: LEGAL VALUE CHAINS, COMPLIANCE AND TRACEABILITY
Strategy: Digitise permits and timber movement (e-tracking) and organise smallholders (Village Land Use Plans, improved germplasm, nurseries, silviculture, associations/out-growers) to form legal, functioning chains with market access.
Links to theory of change: Connects short-range results (digital tracking + producer organisation) to medium-range results (reduced illegality, enforceable standards, market entry) further to long-range results (legal trade, higher e-revenues).
Cases: Tanzania forest resources management information system national roll-out; PFP/PFP II; Tree Outgrowers Support Programme with Finnfund investees; Tanzania Tree Growers Association Union/New Forest Company delivery models.

THEME 3: RIGHTS-BASED COMMUNITY FORESTRY AND TENURE
Strategy: Secure community and grower rights (Village Land Use Plans, Certificate of Customary Right of Occupancies) and operate village/reserve-level management that links conservation outcomes to local revenues and services.
Links to theory of change: Connects short-range results (clarified rights and procedures) to medium-range results (livelihood gains tied to conservation) further to long-range results (improved forest condition and lower deforestation).
Cases: Tanzania FORVAC in village land forest reserves; PFP II mobile Certificate of Customary Right of Occupancy application with Village Land Use Plan-supported tenure packages.

THEME 4: POLICY, INSTITUTIONS AND REGIONAL COOPERATION
Strategy: Reform laws/by-laws and stepwise community-based forest management procedures; strengthen agencies and regional bodies (Convention on Biological Diversity/Nagoya functions).
Links to theory of change: Connects short-range results (coherent frameworks and regional coordination) to medium-range results (operational roll-out and national replication) further to long-range results (institutionalised practice and compliance).

THEME 4: POLICY, INSTITUTIONS AND REGIONAL COOPERATION
Cases: Zambia DFONRMP statutory instrument and seven-step community-based forest management; Kenya Forest Conservation and Management Act 2016 and Kenya Forest Service reforms; Lao PDR SUFORD with the World Bank; BioCAN (Andean Committee on Genetic Resources and Traditional Knowledge reactivation; WWF Access and Benefit Sharing legislation and policies/illegal-wildlife-trade coordination; integrated biodiversity-information platforms).

Source: proformas reviewed by the evaluation team

3.4 Engagement with private sector to date

Key starting points for Private Sector Engagement (private sector engagement) in Forests, Ecosystems and Biodiversity can be tracked to the following:

1. Convention on Biological Diversity (CBD), 1992 – Article 10

"Each Contracting Party shall, as far as possible and as appropriate: …

(e) Encourage cooperation between its governmental authorities and its private sector in developing methods for sustainable use of biological resources." (CBD, 1992)

This is one of the earliest formal legal obligations in international environmental law to explicitly engage the private sector in sustainable use of biodiversity. It places that responsibility on states, especially recognising developing country contexts.

2. "The Future We Want"/Rio+20 Outcome, 2012 – Broadening of stakeholder roles

"We recognize that involvement of all stakeholders and their partnerships, networking and experience-sharing at all levels could help countries to learn from one another in identifying appropriate sustainable development policies, including green economy policies. … We invite governments, as appropriate, to create enabling frameworks that foster … innovation … We invite business and industry as appropriate … to develop sustainability strategies … We encourage … public-private partnerships, to mobilize public financing complemented by the private sector …" (Rio+20, 2012)

While not Forests, Ecosystems and Biodiversity-specific, the Rio+20 Outcome reinforces the norm of private sector inclusion in sustainable development, including in areas overlapping with ecosystems, biodiversity, and forestry. It helps provide a policy environment that sees private sector engagement as legitimate and necessary.

3. CBD COP-10 Decision X/21 (Nagoya, 2010) – "Business Engagement"

"Invites Parties:

(a) To promote a public policy environment that enables private sector engagement and the mainstreaming of biodiversity into corporate strategies and decision-making in a manner that contributes to the achievement of the three objectives of the Convention; …

(b) To create conditions that facilitate private-sector engagement, …;

(c) To identify a range of options for incorporating biodiversity into business practices …" (CBD COP-10 Decision X/21, 2010)

This is a turning point at the treaty implementation level: not just encouraging cooperation (as in CBD Article 10), but calling for enabling public policy, integrating biodiversity in corporate strategy, and concretely defining how to engage business in national policy, regulations, incentives, etc.

Today, partnerships between private sector, communities and governments are of interest to GEF, IUCN, UNEP and WWF Finland. IUCN works closely with the private sector and initially developed Business Engagement Strategy in 2004 (revised in 2012). IUCN published its Operational Guidelines for Private Sector Engagement already in 2007 (IUCN 2007, IUCN 2012) and is now in the process of developing a private sector engagement strategy to identify innovative options to strengthen business engagement and impact, in line with the draft work programme and the 20-year strategic vision (MFA, 2025). UNEP's commitment to private sector engagement is further emphasised in its report Harnessing the Private Sector for solutions to the Three Planetary Environmental Crises, which opens by observing that "tackling the three planetary environmental crises requires a transformative shift in markets, sectors and systems. This means ambitious action from the private sector is critical, and that is why UNEP is seeking to build wider and deeper collaborations that have impact with lasting solutions." (UNEP, 2024b). Specific examples include the Restoration Seed Capital Facility and the Climate Technology Centre and Network. In the GEF projects private sector engagement is gaining traction, with GEF-8 initiatives supporting partnerships in sustainable food systems, nature-based solutions, and the blue economy. Nonetheless, overall engagement remains below potential (GEF, 2025). The GEF's latest Private Sector Engagement Strategy (2020) for the first time specifically mentions micro and small entrepreneurs such as smallholders, sole traders, artisans, and primary producers to be included in the GEF's private sector engagement initiatives (GEF, 2022b).

In addition to conservation objectives, the WWF Finland Programme improves nature-based livelihoods, agriculture, and food security by supporting and partnering with indigenous peoples and local communities. Nature-based solutions are adopted to enhance climate resilience and develop livelihood models and businesses for local communities. In partner countries, WWF partners with local business. However, in Finland it works to promote awareness on global issues and environmental citizenship among the public, government and private sector (WWF, 2022b).

In Finland's development policy and development cooperation, private sector has been connected to forestry for several years and interventions such as Private Forestry Programme (PFP) and Participatory Plantation Forestry Programme (PFP II) in Tanzania have been based on this connection. Engagement of the Finnish private sector has, nevertheless, been very limited in the past (see Table 5 for analysis of the private sector engagement in this evaluation's sample intervention) but the only currently implemented bilateral programme, FORLAND, has taken an active role in promoting private sector engagement. This is well in line with Finland's current trade and development policy which explicitly highlights the role of sustainable forest management in climate change mitigation and adaptation, notes that forests are an important carbon sink and preserver of biodiversity, and places forest value chains as a provider of employment, income and added value. The current policy states that Finnish operators have expertise in forest surveys and information systems, forest industry planning, forest education and research, and small-scale producer-driven forestry, and notes that Finland's technology expertise is evident in the forest industry.

Beyond the ODA channels directly under MFA, Finnfund represents Finland's most significant instrument of support for the forestry sector. With a portfolio of nearly EUR 280 million, of which approximately EUR 112 million is directed to forestry,[9] Finnfund is the only channel where forestry is maintained as a clear priority. Its investments support commercial forestry activities and plantations, including in Tanzania. While distinct from grant-based aid, Finnfund's role highlights the increasing reliance on development finance institutions to sustain Finnish influence in the sector.

Finnpartnership total portfolio (2016–2022) was about EUR 7.5 million, of which EUR 0.7 million was for forestry. They had 10 projects, eight of which in Africa.

Currently, Finland participates in the implementation of the Global Gateway strategy that was launched in 2021. The goal of this strategy is to improve economic and social development in developing countries by boosting smart, sustainable and secure solutions in the digital, energy and transport sectors, and by strengthening healthcare, education and research systems. The Global Gateway is delivered through a Team Europe approach, which brings together the EU and EU Member States with their financial and development institutions. Under the strategy, the EU aims to mobilise investments of up to EUR 300 billion by 2027, including from the private sector. The Global Gateway draws on the financial tools in the EU multi-annual financial framework 2021–2027, in particular the Neighbourhood, Development and International Cooperation Instrument-Global Europe, the Instrument for Pre-Accession Assistance III, the digital and international part of the Connecting Europe Facility, but also Interreg, InvestEU and Horizon Europe, the EU research and innovation programme. Finland encourages the participation of Finnish companies in Global Gateway joint projects, especially in the fields of digitalisation, education, climate and energy solutions. While Forests, Ecosystems and Biodiversity is not a focus sector of the Global Gateway, the strategy advances forest governance, biodiversity conservation and nature-positive value chains through landscape restoration, sustainable forest management, and deforestation-free commodity partnerships. It underpins EU Biodiversity Strategy 2030 commitments and international agreements, which are also supported by Finland (UNFCCC, Convention on Biological Diversity, UN Forest Instrument). There are (i) Forest Partnerships and Team Europe Initiatives delivering jurisdictional approaches, protected-area systems, agroforestry, and community-based forest economy transitions; (ii) Deforestation-free supply-chain support (e.g. cocoa, coffee) through technical assistance, traceability systems, smallholder support, and blended finance for sustainable processing; and Nature-based solutions (NbS) mainstreamed in pipelines (mangroves, watershed restoration, urban greening) with European Investment Bank Global finance and EU grants/guarantees.

9 Available data covered years 2015-2023. Source: Finnfund

4 Findings

4.1 Results and impacts

Summary answer to EQ 1.1 and 1.2 – Results and impacts

Across Finland-supported bilateral and civil society interventions, strong environmental outcomes (long-range result 1) were evidenced, with approximately 11.1 million hectares brought under protection, sustainable management or restoration (FORVAC, Tanzania, 2017–2024: 460,518 ha; DFONRMP/DFA, Zambia, 2015–2019: 32,707 ha; WWF Finland, global, 2018–2024: 6.7 million ha; Siemenpuu, global, 2018–2025: 3.9 million ha). (SDG 15) Deforestation fell inside community-managed forests while comparable reference areas continued to lose tree cover, with tree-cover loss held to 0.88% inside village land forest reserves versus 5.44% in surrounding areas, maintaining about 286,811 hectares of tree cover within a 416,301-hectare area (FORVAC, Tanzania, 2017–2024). (SDG 15) With multilateral partners, 238 million hectares of terrestrial ecosystems (IUCN, global, 2021–2024: 11 million ha; GEF, global, 2018–2024: 227 million ha) (SDGs 13, 15) and 1.5 billion hectares of marine ecosystems (GEF, global, 2018–2024) have been protected or restored.

Sustainable production and livelihood effects were notable (long-rage result 4; SDGs 1, 8, 15). In Tanzania, plantation forest/smallholder wood supply expanded with over 11,000 hectares of new or rehabilitated woodlots and plantations, of which 6,811 hectares independently verified (PFP I–II/TOSP, 2017–2024). Community forestry generated more than EUR 4 million in local revenues with around 55% reinvested and household-level income effects estimated at about 12% of average income in participating villages (FORVAC, Tanzania, 2018–2024). Across programmes, at least 8,700 micro, small and medium-sized enterprises received support (WWF Finland, global, 2018–2024; FORVAC, Tanzania, 2018–2024; PFP II, Tanzania, 2019–2024). At the macro level, Tanzania's forest-asset value was estimated to rise by about EUR 0.5 billion between 2014–2021 alongside stronger smallholder supply, though not a result of Finland alone.

Equity, rights and inclusion advanced in parallel (long-rage result 2; SDGs 1, 5, 10, 16). In Tanzania, community-managed forests channelled a majority share of revenues into community development funds, improving women's and youth participation in decision-making and benefit-sharing (2017–2024). Across programmes, Finnish support reportedly benefitted 89,804 women, 62,374 indigenous/minority persons and 22,913 persons with disabilities (WWF Finland, global, 2018–2024; FORVAC, Tanzania, 2017–2024), while more than 64,000 families saw formalisation of land and resource rights (Siemenpuu, global, 2015–2025).

Policy, legal and institutional reforms (medium-range result 1) were institutionalised where mandates and budgets held and producer organisations consolidated (SDGs 12, 13, 15, 16, 17). Zambia expanded community forests from about 30,000 hectares (2015) to over 1 million hectares (2019) following a statutory instrument, a national seven-step procedure

and community by-laws, with 32,707 hectares designated directly by a Finnish programme (DFONRMP/DFA, 2015–2019). Lao PDR embedded participatory sustainable forest management across roughly 2.3 million hectares and 1,078 villages, about 73% of the production-forest estate, linking approved plans to revenue-sharing and village rules (SUFORD, 2003–2017). Kenya consolidated its framework via the Forest Conservation and Management Act (2016) and organisational upgrades in Kenya Forest Service (2016–2019), while Tanzania issued planning guidelines, participatory village land-use tools and a FLEGT legal-trade review strengthening compliant value chains (2018–2024). Finnish-funded civil society work reinforced uptake: WWF Finland influenced 62 policies/decisions/investments, supported 94 land-use/forest/watershed plans and 35 nature-based/adaptation initiatives, and capacitated 347 local civil society organisations and 2,805 duty-bearers; regional instruments advanced, including the EAC Forest Policy/Strategy and a Southern African Development Community mechanism for seized timber stockpiles (Global/Southern Africa, 2022–2024).

Information systems and clarified procedures (short-range result 1) shifted day-to-day practice towards evidence-based, rules-driven management (SDGs 13, 15, 16, 17). Vietnam converted paper-based forest monitoring into a nationwide digital system used across all 60 provinces, scaling to several thousand communes with approximately 1,300 active government forestry users and supporting Forest Law Enforcement, Governance and Trade/REDD+ compliance (FORMIS I–II/PFG, 2016–2020). In Tanzania, NAFORMA delivered the first multipurpose national inventory and decision-grade statistics, including a quantified 19.5 million m³ annual wood deficit, that informed revision of the National Forestry Programme, while INFORES produced biomass/carbon data enabling national Forest Reference Emission Levels (FREL) and Paris Agreement reporting and supported research and miombo regeneration analysis (2015–2019). The forest resources management information system expanded from civil-society pilot to national timber-consignment tracking with real-time passes and e-revenue (PFP II/FORVAC/TFS, 2019–2024). Globally, FAO's Forest Resources Assessment-2025 online platform further harmonised reporting—improving traceability across forest management information systems/SDG/UN Economic Commission for Europe processes (2023–2024).

'Do no harm': No systematic negative environmental effects were evidenced; risks remained around biodiversity outcomes in exotic plantations, and around fire/drought/pest exposure, underscoring the need for landscape-level biodiversity measures and risk management (Tanzania, 2017–2024).

Finding 1. Finnish support has led directly to protection, restoration or more sustainable management of 460 000 ha of community forests in Tanzania alone, with millions more in other countries directly and/or via Finnish contributions to multilaterals and civil society organisations.

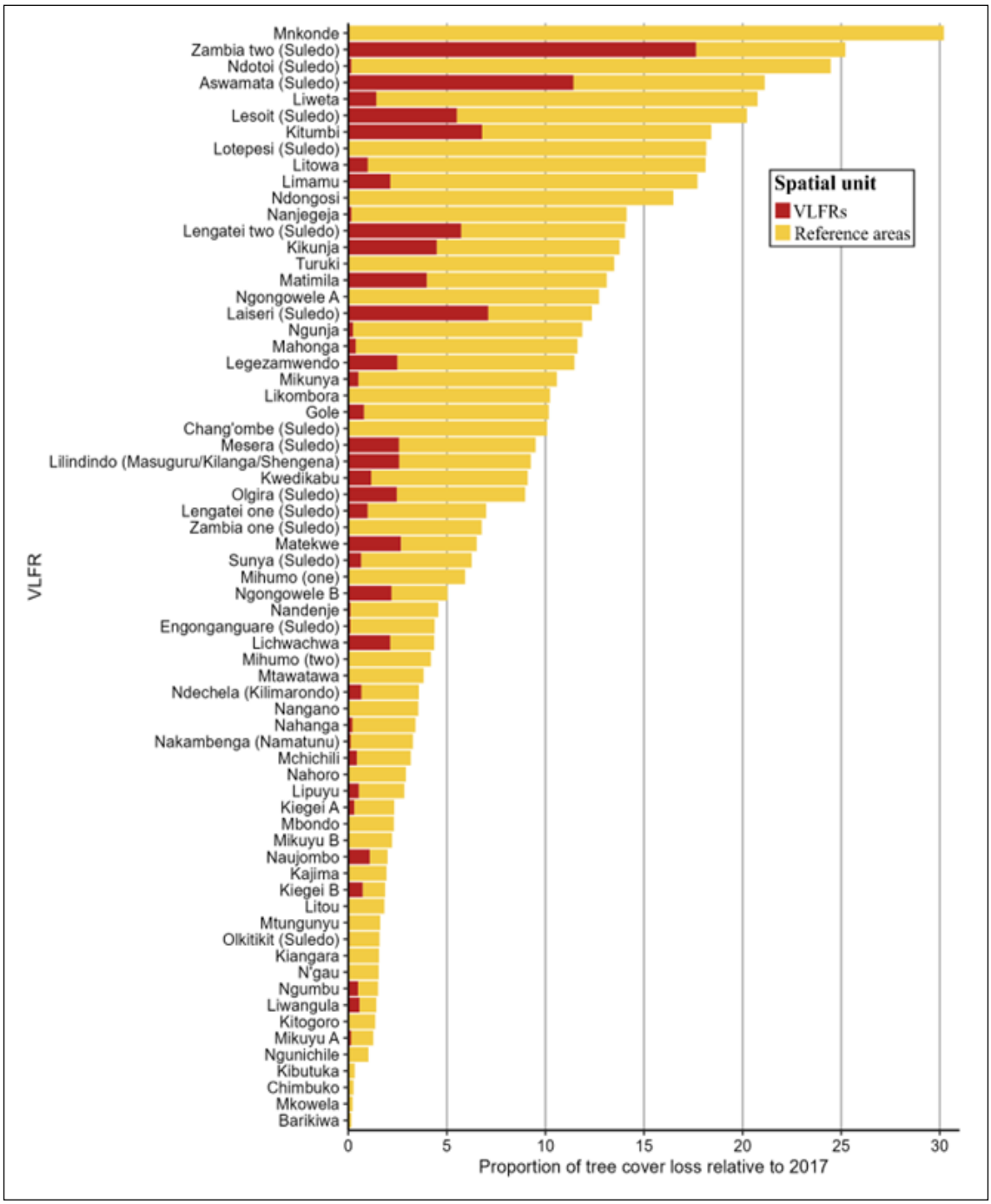
There is strong evidence showing that Finland's support contributed to decreased deforestation and promoted ecosystem recovery. Together, Finnish-supported initiatives contributed to conserving millions of hectares of natural areas and strengthening ecological connectivity across diverse landscapes. Much of that was achieved by bilateral projects. The evidence shows that conservation outcomes were most effective where local governance, supportive policy frameworks, and income opportunities for communities aligned, enabling both large-scale forest protection and sustained reductions in illegal wildlife activity (Finding 3). Where enabling conditions were weak or

programmes ended early, gains were partial or faded. Empirical evidence is strongest in Tanzania's village land forest reserves, with similar patterns where community forests were formalised (e.g. Zambia). Results via CSO/multilateral channels mirror this pathway but are joint and proportional to Finland's funding share.

As evidenced by the geospatial analysis conducted for this evaluation, tree-cover decline in the FORVAC village land forest reserves (short-range result 2) in Tanzania was held to 0.88% between 2017 and 2024, versus 5.44% in surrounding reference areas (Figure 9), helping maintain 286,811 ha of tree cover within a 416,301 ha estate.[10] The results show that most reserves have served as effective barriers against deforestation (Figure 10), demonstrating strong sustainability of the results. village land forest reserves in the north generally experienced more deforestation than those in the south. The FORVAC completion report highlighted a strong correlation between income from sustainable timber in village land forest reserves and deforestation rates. Reserves generating the highest income recorded the lowest rates of deforestation, while those with little or no income experienced significantly higher rates, though still lower than those observed in other forests. 460,518 ha were brought under community forest management plans (short-range results 1/2), with 52,609 ha set aside as strict protection from timber harvesting (short-range result 4; FORVAC 2024). The positive environmental benefits and overall success of FORVAC were also confirmed in the interviews. FORVAC has been generally regarded as one of the most impactful MFA funded projects in the Forests, Ecosystems and Biodiversity sector with strongly sustainable results.

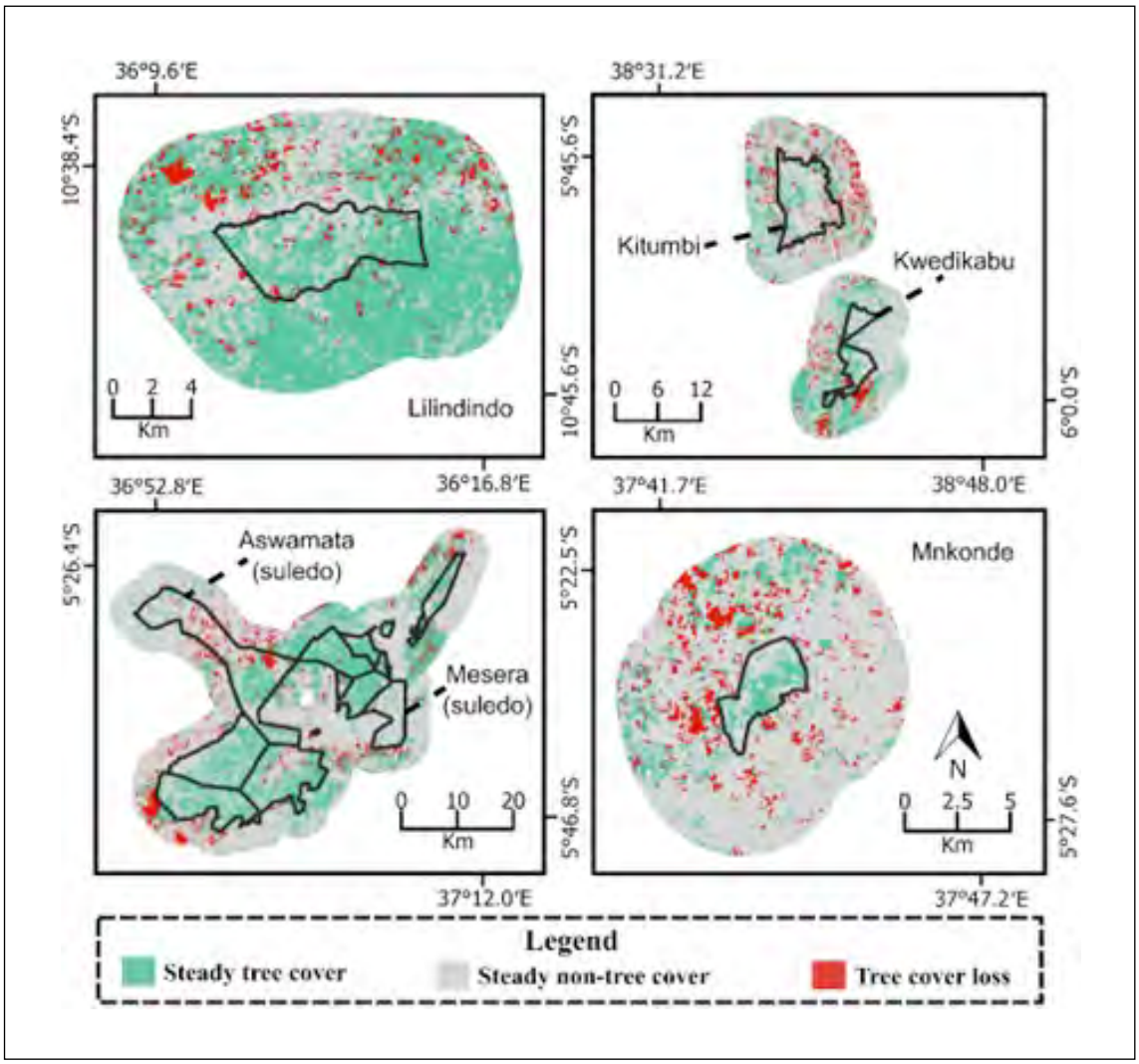
10 Hectares reported by the geospatial study of FORVAC are different to what project itself reported due to data limitations. See Finding 11 and Annex 4 for more details.

Figure 9 Percentage of tree cover loss in each village land forest reserve and its reference area relative to their area covered by trees in 2017



Source: Evaluation team's geospatial analysis (see Annex 4 for more details)

Figure 10 Tree cover dynamics 2017–2024 in the analysed village land forest reserves and their corresponding reference areas (5 km buffers)



Source: Evaluation team's geospatial analysis (see Annex 4 for more details)

In Zambia, policy encouraged a rapid increase in community forests, which expanded from about 30,000 ha in 2015 to over 1 million ha by 2019, with reported reductions in illegal logging and agricultural clearing – sending a strong sustainability signal. This expansion (long-range result 1) was partly supported by the *Decentralised Forest and other Natural Resources Programme*. It increased community forestry by approximately 30,000 ha through stronger Community Forestry Management Groups (short-range result 2), which improved forest data management capacity (short-range result 4), and by creating more supportive policy environment built through CSO networking and advocacy for legal reform (short-range result 6), which together strengthened local governance and compliance (medium-range result 1). MFA's decision to end the project meant that it could not pursue income-earning opportunities from community forests, where potential was high from timber harvesting and REDD+. These income opportunities had later been picked up by projects of other donors, leading to large areas being protected under the Community Forestry legislation, while forest-adjacent communities have received substantial payments (several million USD annually) from carbon credits (FCG, 2020). The Tanzanian and Zambian cases confirm that local people generally want to control local ecosystems for their own long-term benefit and that supportive policy environments can enable rapid designation of community forests.

Finland's funding to several international partners using the same approach to conserve forest ecosystems in many locations have contributed to positive tangible results. IUCN reported over 7 million ha under protection and more than 4 million ha restored, benefiting 7.2 million people. However, these results are difficult to locate and in line with Finland's modest share of the framework agreement funding, only around 0.44% of outcomes can be linked to Finnish support. FAO's Forest and Farm Facility, to which Finland has been a minor co-financier, has also achieved positive results: In Phase I, 114 new community forests were recognised, 100 forest management plans developed, and integrated forest and land management plans piloted across 50,000 ha of forests, mainly in Gambia (FAO, 2018). According to the 2022 annual report of Phase II, 161,993 ha of forest and farm producer land were restored, protected, or sustainably managed, although it remains unclear how much of this area was forest land and how much farmland. Most recently, in 2024 alone, the Facility reportedly added 531,000 ha under restoration, protection, and sustainable management, with documented social co-benefits for 78,000 people (FAO 2025a). Based on Finland's financial contribution, approximately 8.8% of these results can be linked to Finland. At global programme level, GEF-7 and 8 results point to very large scales, with over 210 million ha protected or better managed forests, approximately 17 million ha restored, and about 295 million ha under improved practices – with Finland's contribution proportional to its ~1–1.26% share.[11]

Core support for CSOs has enabled partners to reach positive results. Interviews and independent evaluations (Osma Advisory, 2021 and 2024) confirm WWF's positive environmental impacts. Between 2014 and 2024, WWF-supported programmes reported sizeable area results. In 2014–2017, 112,000 ha of forest were brought under community ownership, followed by 2.516 million ha in 2018–2021 under a combined indicator covering protection/sustainable forest management/restoration/tenure. In 2022–2024, 1.862 million ha newly designated under protection, 2.319 million ha under sustainable forest management, and 17,429 ha restored (reported as distinct, non-additive categories).[12]

Interviews in Finland and Vietnam confirmed that FORMIS II produced a sustained, nationwide improvement in forest monitoring and reporting that strengthened conservation outcomes – namely more credible and timely conservation planning, evidence-based land-use decisions, and compliance with international commitments (e.g. REDD+, Forest Law Enforcement, Governance and Trade) and cooperation (long-range result 3).

The evidence confirms the theory of change results chain: Clarifying rights (short-range result 1) and empowering user groups (short-range result 2) increased rule-compliance and community investment in forests, strengthening institutions/practice (medium-range results 1–2). Where these held together with equitable benefit-sharing (medium-range result 4), local pressures to clear forest fell, contributing to environmental long-range result (forest cover, biodiversity, climate). Across bilateral, CSO and multilateral channels, the same causal pathway dominated: tenure clarity, empowered local management, and viable legal market outlets lead to reduced deforestation.

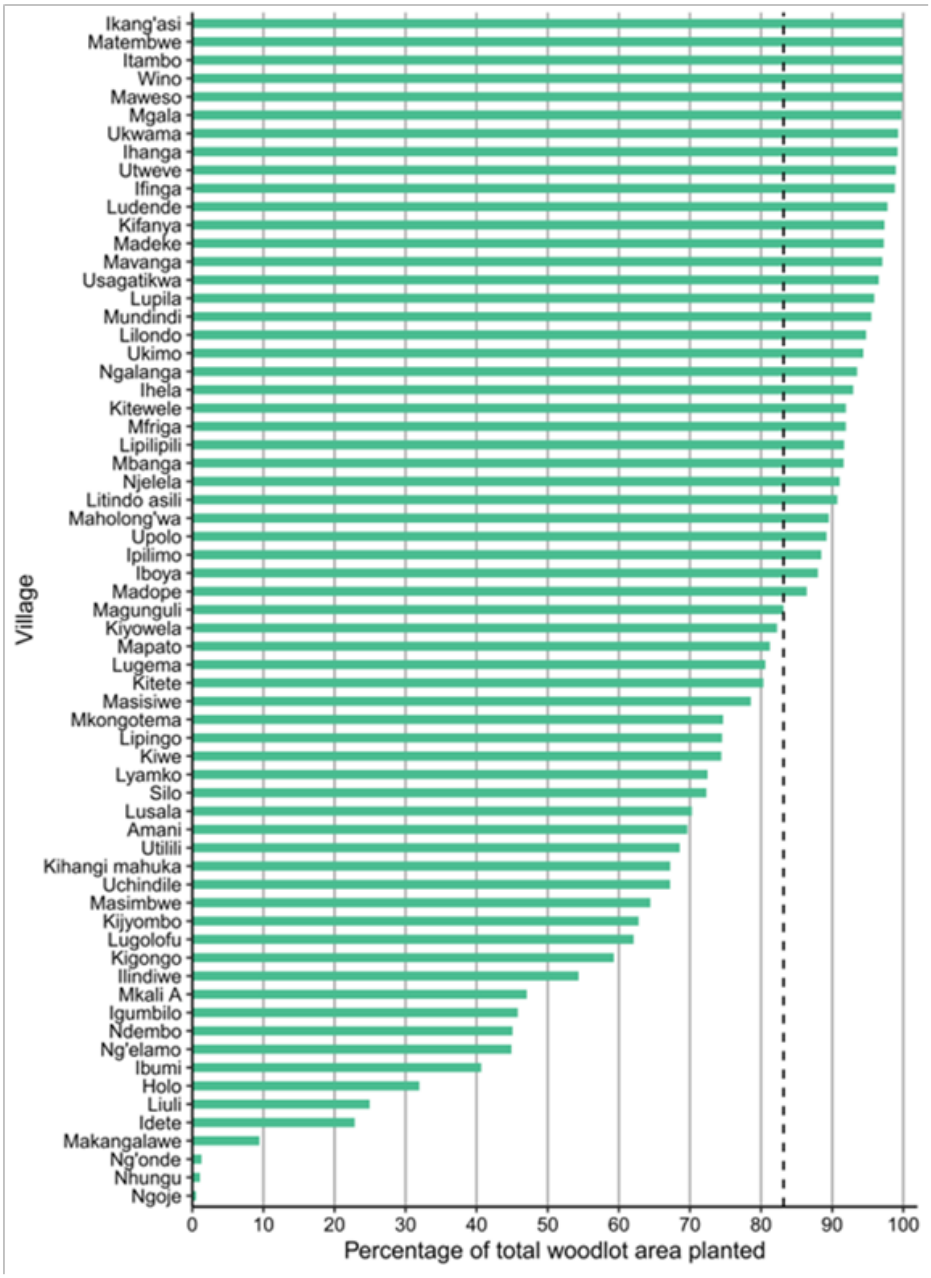
11 Attribution was calculated pro-rata to Finland's share of replenishment funding (GEF-7 ≈ 1.0%; GEF-8 = 1.26%). Numbers denote expected/programmed results, not realised outcomes.

12 These figures should not be summed into a single cumulative total due to category overlap and differing indicator definitions across programme periods.

Finding 2. Finnish support contributed to expanding tree cover through forest plantations and strengthened plantation management, with 6,811 hectares of forest planted in Tanzania.

Reportedly, the plantation forest estate in Tanzania's Southern Highlands increased from about 207,000 ha in 2017 to over 250,000 ha in 2021 (predominantly smallholder-owned), increasing total tree cover and improving economy (PFP, 2018; PFP II, 2024). Although the increase is not an achievement of PFP projects alone, the Finnish investment had a positive contribution as evidenced by the geospatial analysis (Annex 4). According to PFP reporting, during 2014–2018 the cumulative planting area of PFP was 11,669 ha (including TOSP). The geospatial analysis could not fully confirm the surface area reported by PFP, as it could not analyse all the PFP supported area due to data limitations. However, it did find that from a total woodlot area of 8,732 ha analysed, about 78% had been planted by 2024, with over half of villages exceeding 80% of their PFP allocation (Figure 11). Project reports and interviews confirmed that to further support the efforts, PFP established 140 ha of seed orchards, the largest such area in Southern/Eastern Africa (interviews).

Figure 11 Percentage of the total woodlot area planted by village



The dashed line indicates the median value.

Source: Evaluation team's geospatial analysis (see Annex 5 for more details)

In Lao PDR, SUFORD – funded jointly by MFA and the World Bank – brought nearly 2.3 million ha, about 73% of the national production forest area, under programme coverage, engaging 1,078 villages. This extended law-enforcement support across all 18 provinces, piloting forest-landscape management on over 3 million ha and signalling nationwide uptake of managed status and compliance. In this case, Finnish finance share was about 40% and used for providing the technical assistance inputs to the whole programme.

Siemenpuu (2022–2024) reportedly added over 9,000 ha of new forested areas under community-based sustainable use and strengthened biodiversity in forest landscapes, alongside 100 ha of restoration and 52,000 trees planted. During previous programmes (2014-2017 and 2018-2021)

Siemenpuu brought approximately 3.86 million hectares of land under ecologically sustainable use of land or under regimes that maintain or improve their biological diversity.

While plantation forests are aimed at economic benefits and do not have the same environmental value as protected forests or long-term plantings, the use of suitable species and attention to sustainable management indicate that these plantation forests likely had environmental benefits. They contributed positively to increased tree cover, and helped with forest conservation by providing designated planting areas, reducing deforestation for the same purpose in other forested areas.

Finnish inputs and instruments (bilateral, CSO and multilateral support with technical assistance, nurseries and seed orchards) generated short-range results by enabling user groups to plant and manage woodlots, strengthening participatory research/knowledge, and bringing additional areas under participatory, sustainable management (short-range results 2/6/4). These fed into medium-range results by expanding lawful domestic wood supply, supporting micro, small, and medium-sized enterprise participation in sustainable supply chains, and contributing to a more sustainable and inclusive forestry sector (medium-range results 2–4). The intended long-range effects are environmental (cyclical carbon stock increases) and economic (jobs and value added from enhanced value chains; long-range result 4), with social benefits where revenues are shared fairly (long-range result 2). Realisation of these linkages rests on theory of change assumptions: coherent policies, sustained budgets, tenure recognition and openness in information systems, and a conducive market/policy environment for private investment and legal trade. Without these, plantation gains risk remaining localised and less durable (see Finding 7).

Finding 3. Biodiversity outcomes were moderate – as bilateral programmes largely neglected biodiversity integration and monitoring, while civil society organisations and multilateral channels delivered tangible gains and normative and catalytic results.

Even though MFA's total contribution is small, its multilateral and intergovernmental partners (i.e. GEF, IUCN and UNEP), and WWF Finland and Siemenpuu Foundation, are all implementing programmes and activities that address root causes of environmental and biodiversity harm at global, national and local level. Community-managed natural forests can deliver strong biodiversity and carbon outcomes, aligning with the theory of change's expectation that impact flows from sustained, rights-based management. Plantation-driven area increases contribute to the resource base and short- to medium-term carbon stocks but their environmental benefits depend on species choice, rotation length and management standards. Its permanence and biodiversity value remain lower.

Evidence from external evaluations indicated that bilateral interventions in Tanzania and Lao PDR largely prioritised forest cover and production objectives over biodiversity. In Tanzania, FORVAC made only limited attempts to integrate or monitor biodiversity. Such measures would have been relevant, although threats to biodiversity are much less in community-managed miombo forests, which are natural and native ecosystems, than is involved in establishing exotic tree plantations that can sustain almost no indigenous species. Therefore, biodiversity gains are expected to be strongest in natural forests (FORVAC), as plantation forests primarily expanded the resource base (PFP).

Deforestation leaves soils vulnerable to degradation and erosion, and forest plantations can have a protective effect, especially where suitable species are chosen and management practices are sympathetic to the need to maintain soil protection. But an independent evaluation (Remme et al., 2023) reported, and the geospatial analysis confirmed, that among tree species planted in PFP, pines dominated with 6,911 woodlots and 4,964 ha planted, followed by eucalypts and

teaks. Eucalypts and pines showed the highest planting effectiveness (86.58% and 76.78%), while teaks and unspecified species remained below 50% (Figure 32 in Annex 5). PFP II did not implement planned actions such as a carbon forestry project, updated biodiversity guidelines or landscape-level biodiversity promotion, despite the documented vulnerability of exotic species *(Pinus patula, Eucalyptus grandis)* to fire, drought, pests and disease. Fire remained a key risk even as operational control improved (Remme et al., 2023). In Lao PDR, the bilateral portfolio did not address protected-area management as intended and failed to establish a viable integrated conservation development model, so biodiversity considerations were effectively neglected (Mikkola et al., 2019). After the closure of the regional biodiversity programme in the Andean region, there were no bilateral programmes focusing explicitly on ecosystems or biodiversity. By contrast, Finnish funded CSO efforts reported concrete biodiversity gains. As mentioned in Finding 1, WWF has achieved strong habitat and landscape outcomes. Additionally, they documented positive results on species recovery: In East Africa, regional elephant and rhino populations increased while poaching declined; In Nepal, greater one-horned rhinos rose from 645 (2015) to 752 (2021) and tiger numbers increased from the ~200 baseline, with repeated 365-day 'zero-poaching' periods in programme areas; and in Borneo, a stable orangutan population was maintained within programme landscapes. Pressures on biodiversity were reduced through adoption of supportive strategies and policies (see Finding 8), and evidence generation improved through 49 biodiversity monitoring initiatives active by 2024. In 2022–2024, reportedly 36,300 right-holders benefitted from climate measures, including watershed bio-engineering and flood-protection for 1,308 households in Nepal, agroforestry/riverbank stabilisation in Uganda, and coastal adaptation planning in 12 Mozambican communities. (WWF Finland, 2025a). As evidenced by documentary review and interviews, Siemenpuu-supported initiatives strengthened forest biodiversity through supplementary plantings and the protection of sacred natural sites in Indonesia and Kenya. (Siemenpuu, 2022; Interviews).

UNEP's reported results under the Nature Fund (2023–2025) are global, and primarily normative and catalytic. The Fund applies a 70/30 spending formula that prioritises biodiversity conservation/restoration, mainstreaming, and Kunming–Montreal Global Biodiversity Framework governance. It has supported workstreams such as the Global Peatlands Initiative and Assessment, guidance for a sustainable blue economy, and country support for Global Biodiversity Framework-aligned National Biodiversity Strategy and Action Plan updates, including integrating food systems. Results are best read as policy, capacity and coordination outcomes that enable SDG 14/15 delivery rather than as additive area figures. GEF, Finland's most important biodiversity vehicle, reports cumulative expected results per replenishment cycle in distinct, non-additive indicators: GEF-7 includes 116.6 million ha of terrestrial and 1,390.5 million ha of marine protected areas created or under improved management, plus 8.2 million ha restored, 160.8 million ha of production landscapes under improved practices (86.7 million ha to benefit biodiversity), and 105.3 million ha of marine habitat under improved practices. GEF-8 (to June 2025) reports 94.2 million ha terrestrial and 124.2 million ha marine protected areas created or improved, 134.6 million ha of landscapes under improved practices (88.6 million ha to benefit biodiversity), 65.6 million ha of marine habitat under improved practices, and 30.6 million people benefiting – including 15.6 million women. (GEF, 2022; GEF 2025; Interviews).

Finding 4. Finnish support contributed moderately to stronger inclusion and equity for women, indigenous peoples, ethnic minorities and smallholders, but benefit-sharing results remained weak.

Finland has systematically promoted gender equality and inclusion across the Forests, Ecosystems and Biodiversity portfolio with moderate results. The evaluation did not find strong evidence on results related to equitable benefit sharing from renewable natural resources (medium-range

result 4). Therefore, it is found that performance in this result area has been weak and lacked solid and sustained support from Finland.

Enablers of inclusion consist of rules, transparency and participation mechanisms. Finland has evidently promoted governance, rights-based and participatory approaches across the Forests, Ecosystems and Biodiversity portfolio. In Vietnam, a transparent, decentralised forest information system (FORMIS; short-range result 1) coupled with community-level empowerment (short-range result 6) expanded voice and agency for women and ethnic-minority users (medium-range result 2), enabling boundary verification, livelihood and civic engagement, and links to markets (long-range result 2). FORMIS II's technical focus was complemented by PFG's community-level inclusion work, laying groundwork for further collaboration to build upon these largely Finnish results (Williams et al., 2019; Interviews). In Tanzania, bilateral livelihood programmes that combined tenure clarity, transparent sales and basic market services recorded household income gains and community dividends, with equity effects strongest where village institutions functioned well and representation mechanisms were active (FORVAC, 2024; Remme et al., 2023). See Findings 1 and 7 for more details.

Civil society channels translated 'voice' into local agency and services. Interviews and results reports indicate that Siemenpuu strengthened land rights for more than 64,000 families to encourage sustainable use of natural resources and provided renewable electrification to over 300 households to relieve demand for fuelwood.[13] In Mali, household solar energy projects increased women's income and decision-making roles while reducing reliance on firewood and charcoal for cooking (links to Energy, Circular Economy and Critical Minerals sub-sector). In Myanmar, indigenous land registration, community forest and water management systems, and advocacy networks were supported (Siemenpuu Foundation, 2025b; Interviews) – theory of change short-range results that are likely to contribute to long-term inclusion and equity through medium-range results, though depth and scale are not yet evidenced at the long-range result level. WWF reported inclusive reach with documented equity gains. Between 2018–2024, 185,792 people directly benefitted from WWF's work, 89,186 of which were women, about 62,374 indigenous/minority, and 22,887 persons with disabilities. Additionally, hundreds of local CSOs, including women's-rights, disability and indigenous peoples' organisations, were capacitated. However, also challenges in inclusion and equity, as well as gaps on fair benefit-sharing were reported. Male-dominated participation, lower female enterprise ownership, measurement limits on disability inclusion, and seldomly tracked benefit-sharing distribution were noted. (WWF, 2021, 2024; Eklöf, 2022; Stakeholder consultations).

Multilateral channels such as the FAO's Forest and Farm Facility and GEF supported producer organisation and livelihood diversification. Finland's role was contributory and proportional to its financial support. FAO's Forest and Farm Facility reported growth in producer organisations, including a marked increase in women's leadership and in the participation of indigenous peoples and local communities. The facility supported 169 majority-women groups in 2022 (up from 64 in 2021), signalling rapid expansion of women-led organising and enterprise within family forest producer organisations. By 2024, Forest and Farm Facility reports that 53 apex family forest producer organisations were incubating 852 family forest producer organisations, and 417 of these had clearly developed/enhanced added value, more than half led by women, indicating women's leadership in commercial upgrading. In 2024, the Forest and Farm Facility supported family forest producer organisations helped secure 64 national-level policy changes (a 25% rise on 2023).

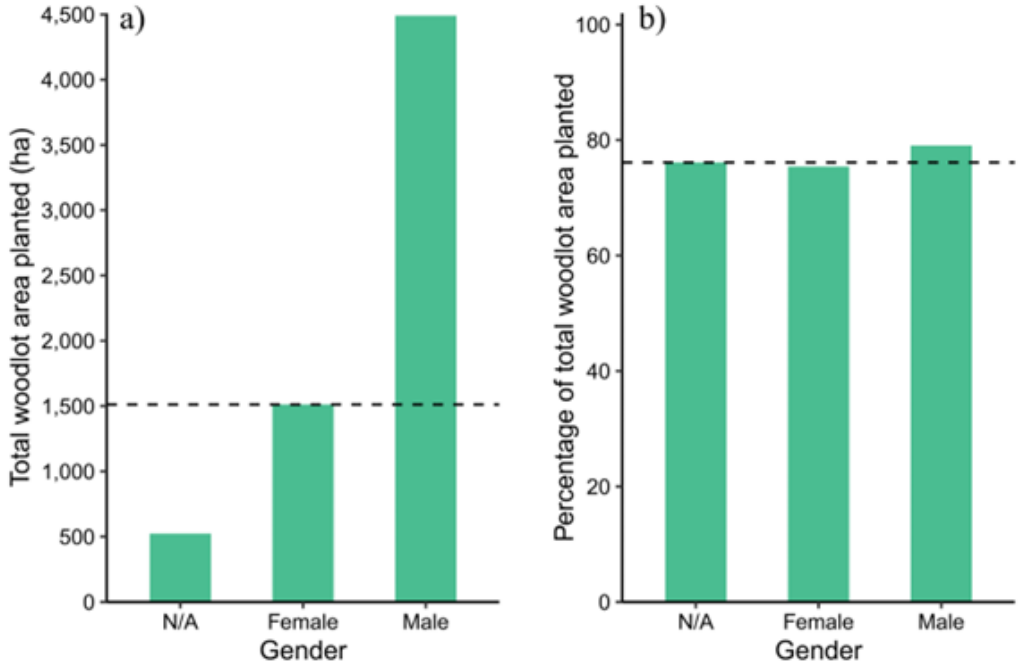
13 Siemenpuu data only for the years of 2018-2021 and 2022-2024. During the years 2015-2017 over 43 000 persons received similar support (number of families not available) (Siemenpuu Foundation, n.d.).

While not all are purely 'gender' acts, the Forest and Farm Facility frames this policy traction as part of its inclusive approach that elevates women, indigenous peoples and local communities in decision-making. (FAO, 2025a). The evidence supports medium-range result 2 and contributes to long-range result 2 outcomes where policy settings were not hostile. GEF-supported interventions that coupled ecosystem restoration with livelihood diversification and participatory governance (medium-range result 1) delivered clearer inclusion and equity gains for forest-dependent communities (long-range result 2; GEF IEO, 2025). Households obtained diversified incomes from agroforestry, ecotourism, sustainable fisheries, and non-timber forest products, and improved food security, while reducing their reliance on extractive practices (a 'do-no-harm' signal of lower pressure on forests linking to long-range result 1). Community management committees, women's cooperatives and indigenous land-use mapping (short-range results 2 and 1) strengthened local agency and legitimacy (medium-range result 1), ensuring benefits reached women and indigenous groups and were more fairly shared (long-range result 2; GEF IEO, 2025).

An independent evaluation found that in INFORES cross-cutting objectives such as human rights, gender equality and good governance were effectively integrated and advanced (Caldecott et al., 2020). Portfolio experience also shows fragility of gender inclusion and human rights-based approach. When funding stops, the partners do not continue with the work since mainstreaming often depends on external resources (FCG, 2020).

Entry barriers constrained women's initial participation in plantation and value chain initiatives in Tanzania. Once women entered, performance parity was observed – i.e. women's planting performance was equal to men's (Figure 12), which suggests selection constraints rather than capability gaps (PFP/TOSP reporting; PFP geospatial analysis, Annex 5).

Figure 12 Total woodlot area planted by beneficiary gender



Total woodlot area planted (a) and percentage of the total woodlot area planted (b) by beneficiary gender. The category "N/A" corresponds to beneficiary institutions and woodlots without information on beneficiary gender or name. The categories in both plots follow the order from a) for comparability. The dashed line indicates the median value of each plot.

Source: Evaluation team

Several regional initiatives lacked operational gender strategies and practical inclusion instruments, resulting in weak or unobserved long-range result 2 outcomes despite policy statements. In the Andean forestry and biodiversity projects, intended cross-cutting priorities were not adequately mainstreamed due to resource limits and country priorities, so male producers dominated, and late fixes were limited to nurseries or packaging (Topper et al., 2017; Oksanen et al., 2015). In multilateral settings, cross-cutting objectives were unevenly carried forward. NAFORMA's design reflected FAO's gender commitment, but this was not sufficiently present in stakeholder and beneficiary analysis, and SUFORD-SU, while meeting World Bank standards and judged gender-aware, fell short of Finnish expectations for gender equity and social inclusion (FAO, 2015; Mikkola et al., 2019).

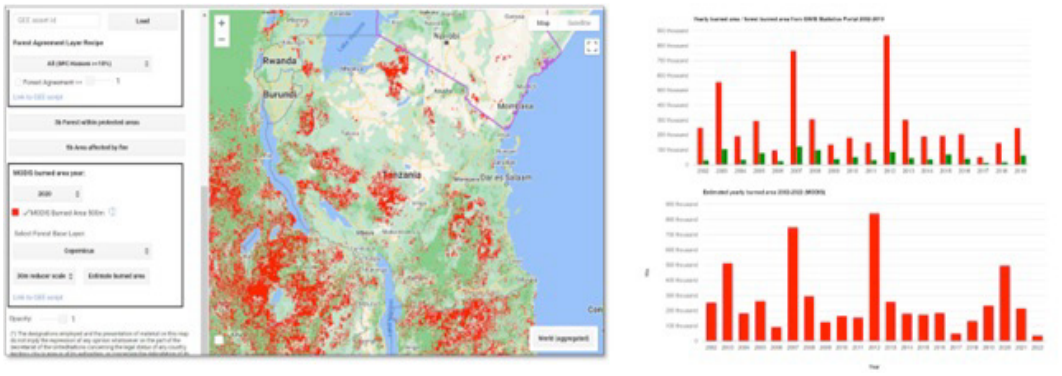
Finding 5. Finland's support to global data standards and reporting systems strongly advanced comparability and evidence-based management.

FAO's Forest Resources Assessment-2025 strengthened the evidence base for cross-border biodiversity and climate management by expanding country reporting on fires, biodiversity and primary-forest values, and by driving large-scale adoption of the Forest Resources Assessment online platform with high user satisfaction (about 90%), indicating active use (FAO, 2024; FAO, 2025b). Harmonisation across UNFCCC, SDGs and UN Economic Commission for Europe reduced duplication and errors and improved traceability and comparability for transboundary governance and access to results-based finance (FAO, 2024). Finland's contribution significantly helped to sustain the process and exceeded the proportion of its funding share.

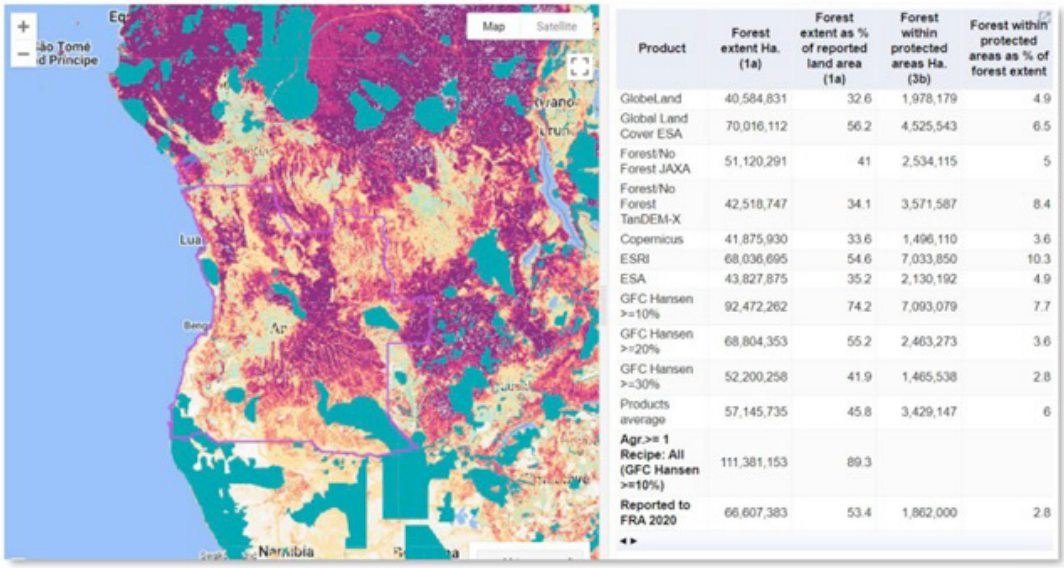
Open Foris, initiated with Finnish financial and technical support, matured into widely used open-source toolkit globally. By 2023, there were nearly 500 registered users in 78 countries, the wider suite counted roughly 250,000 users worldwide, and the tools were used in about 90% of 65 national forest emission submissions, confirming their role as the de facto global standard. Interview evidence credited Finland's early backing as decisive, noting that Open Foris "would not exist without Finland's support" (Interviews; FAO, 2024). FAO's Enhancing accuracy, accessibility and transparency of global forest resources data (2022–2023) project further upgraded the Forest Resources Assessment-2025 platform with traceability features and optional between-cycle updates, and trained 299 participants from 157 countries with a focus on Africa. It improved reporting on deforestation, fires and forest area within protected areas and advanced guidance on primary forests (Figure 13).

Figure 13 Improved reporting on climate and biodiversity variables

a)



b)



Product	Forest extent Ha. (1a)	Forest extent as % of reported land area (1a)	Forest within protected areas Ha. (3b)	Forest within protected areas as % of forest extent
GlobeLand	40,584,831	32.6	1,978,179	4.9
Global Land Cover ESA	70,016,112	56.2	4,525,543	6.5
Forest/No Forest JAXA	51,120,291	41	2,534,115	5
Forest/No Forest TanDEM-X	42,518,747	34.1	3,571,587	8.4
Copernicus	41,875,930	33.6	1,496,110	3.6
ESRI	68,036,695	54.6	7,033,850	10.3
ESA	43,827,875	35.2	2,130,192	4.9
GFC Hansen >=10%	92,472,262	74.2	7,093,079	7.7
GFC Hansen >=20%	68,804,353	55.2	2,463,273	3.6
GFC Hansen >=30%	52,200,258	41.9	1,465,538	2.8
Products average	57,145,735	45.8	3,429,147	6
Agr.>= 1 Recipe: All (GFC Hansen >=10%)	111,381,153	89.3		
Reported to FRA 2020	66,607,383	53.4	1,862,000	2.8

a) The Forest Resources Assessment platform integrated Global Wildfire Information System (GWIS) data to enhance reporting on forest fires.
b) A geospatial tool supporting the reporting of forest area within protected areas was integrated into the Forest Resources Assessment platform.

Source: FAO, presentation of main achievements of GCP/GLO/1030/MUL project

At national level, Finland supported first-ever nationwide forest inventories in some countries and system upgrades in others, strengthening their capacity to generate comparable data that feeds into international reporting (FAO, 2024; FAO, 2025b; Interviews). In Vietnam, interviews confirmed that FORMIS II ensured standardised, near-real-time data flows into national reports, reinforcing global comparability. Seven years on, the system still underpins day to day forest governance, though its maintenance has lagged and some functionality (e.g. public data sharing application) has lapsed. The latest changes in the context, i.e. substantial government reform, inevitably make the future of FORMIS uncertain. However, Vietnamese stakeholders have expressed satisfaction with the system and would like to see it updated to meet the current and future needs, and thus continue serving the Vietnamese forest sector. Even if the system would not continue to be used in the future, the capacity gained through the work will likely remain. Therefore, FORMIS is assessed to be strongly sustainable.

The evidence tracks along the theory of change's pathway from improved data, platforms and shared knowledge (short-range results 1 and 6) to standardise statistics and reporting, strengthening

institutional practice under medium-range result 1 and improving sustainable sector governance under medium-range result 2. These steps enable environmental long-range results (long-range result 1) by making biodiversity/climate management more evidence-based and traceable, and – where governments keep systems open and funded –support broader cooperation and access to results-based finance.

Finding 6. Finland's multilateral core support contributed to strengthening global arrangements for sharing knowledge on ecosystems and biodiversity and on good practices and policies for ecosystem management.

Unearmarked core funding is the most valuable kind of support for multilateral institutions and civil society organisations because it secures consistency, continuity and flexibility. Finland frequently provides support in this way and is therefore strongly appreciated as a donor, even though its financial share is modest in relative terms (≈0.44% of IUCN funding in 2021–2024, ≈1% of GEF 7 and 8 replenishments, 39% of UNEP Nature Fund). Partners highlighted that such flexible, predictable contributions act as "glue" that sustains cooperation and enables responses to emerging issues. FAO, for example, reported that Finnish core support helped mobilise tens of millions in additional funding for the Forest Resources Assessment and encouraged other donors to invest through their own programmes.

Finland's flexible and trusted style of engagement was seen as a distinctive added value within the cooperative architecture for shared ecosystems. Interviews confirmed that partners used this support to sustain and extend global public goods and policy frameworks. IUCN advanced strategy elements linked to the High Seas Agreement on Biodiversity Beyond National Jurisdiction and continued to deliver global public goods such as the Red List of Threatened Species and the mainstreaming of nature-based solutions. GEF maintained support for implementation of the Rio conventions, reinforcing global commitments on biodiversity and climate. UNEP confirmed that Finnish funding helped to accelerate delivery of the Global Biodiversity Framework through regional capacity-building workshops and through the promotion of systems thinking and whole-of-society approaches, including explicit links to biodiversity-health connections and circular economy initiatives (Interviews; UNEP, 2024a). WWF Finland reportedly influenced more than 60 international or multi-country policy and investment processes in 2022–2024 (WWF, 2025a).

International policy influence was also evident through thematic programmes and funds. The UNEP Nature Fund translated science into policy through flagship products such as the Global Peatlands Assessment, with Finland's support enabling global sharing and uptake. The same funding allowed UNEP to provide technical guidance on ocean-based climate solutions to the G20 and to support the Antigua and Barbuda Agenda for Small Island Developing States (UNEP, 2022; United Nations General Assembly, 2024). IUCN leveraged its large membership and expert network to deliver standards, guidance and knowledge products relevant to governance and the Global Biodiversity Framework (IUCN, 2024). It is worth noting that as Finland's contributions were largely core support and pooled funding, therefore the results are joint and not attributable to Finland in isolation. In these cases, Finland's role is best understood as contributory and proportional to its funding share.

Finding 7. Finland contributed to tangible local livelihood gains and poverty reduction, but economy-wide value chain growth remained weak.

Despite dedicated attention, value chain development for ecosystem and forest goods and services fell short of targets. While local gains were achieved, design and programme duration limited durable, economy-wide outcomes, which are critical for sustaining prior investments.

Kosovo and Tanzania are good examples where livelihood gains were achieved alongside conservation. In Kosovo, FAO support increased the forest sector's economic contribution, improved employment prospects, and reduced inter-ethnic tensions through the sustainable use of forest resources in rural communities, which is consistent with the theory of change chain from short-range result 4 to medium-range result 2 (FAO, 2019). In Tanzania, FORVAC and PFP II supported at least 8,653 micro-, small- and medium-sized enterprises. They have started delivering poverty reducing impacts at local level and stand a chance to be strongly impactful at national level. Sustainable timber enterprises reportedly generated over EUR 4 million, with 55% reinvested in community social development. This equalled about 12% of average household income in FORVAC communities and correlated with lower deforestation. Interviews and past evaluations confirmed the positive contribution to poverty reduction, although income gains were not evenly distributed across all village land forest reserves (see Findings 1 and 4; FORVAC, 2024; Remme et al., 2023; PFP II, 2024; Interviews).

Upstream systemisation strengthened smallholder supply base in Tanzania where PFP and PFP II expanded planting with strong follow-through. The estimated value of Tanzania's forest asset reportedly rose by EUR 0.5 billion between 2014 and 2021, with increases in industrial roundwood production and exports. These sector-level signals are directionally consistent with an improved smallholder supply base, though not solely attributable to Finnish ODA (PFP II, 2024). The geospatial analysis supports the conclusion of an independent evaluation (Remme et al., 2023) that PFP II increased the availability of improved wood from better-managed smallholder plantations, and strengthened capacities, organisations and inputs. PFP also mobilised rural communities for economic activities and provided training and extension for small-scale forest enterprises (see Finding 2 and Annex 5). Importantly, livelihood improvements in Tanzania did not come at the expense of forests. In FORVAC, better-stocked forests with higher legal harvesting income experienced less deforestation, while PFP expanded the smallholder-led plantation base and delivered local livelihood gains without increasing deforestation (link to long-range result 1).

Delivery model and resourcing shaped downstream outcomes. TOSP continued PFP's activities and supported smallholder tree plantations through Finnfund-funded companies and institutions to establish financially sustainable and inclusive plantation forestry operations (Finding 14). It co-financed up to 50% of costs for three private sector actors but with uneven results. One partnership ended early in difficult circumstances, while the second spread resources too widely, resulting in effects too thin for strong impact. The third one worked with fewer villages with larger resources and concentrated extension, producing better-managed and more valuable woodlots. These differences illustrate how design and resource concentration influenced performance at scale under medium-range result 3 (Remme et al., 2023).

Scale at channel level was helped by multilaterals, with modest Finnish contribution. FAO's Forest and Farm Facility reportedly incubated 852 producer organisations in 2024. Additionally, it reported restoration, protection and sustainable management in over 531,000 ha and improved social and cultural services for more than 78,000 people. GEF reported livelihood co-benefits where restoration was paired with participatory governance and diversified value chains. These patterns align with the theory of change expectation that stronger value chains lead to jobs and productive uses that move from medium-range result 3 towards long-range results. Finland's share of the results is considered limited due to its modest contributions (FAO, 2025a; GEF Independent Evaluation Office, 2025).

Complementing the Forest and Farm Facility and GEF evidence, WWF-led programmes delivered tangible local livelihood gains while wider value chain shifts remained limited. In 2018–2024,

11,932 smallholders received production/market-access support, and 130 micro-, small- and medium-sized enterprises were assisted to access value chains (short-range results 4 and 3). However, no significant changes were observed in micro-, small- and medium-sized enterprise operating environments, and economies in remote landscapes saw limited market effects, constraining scale-up beyond local gains – i.e. efficiency and production improvements depended on mid-stream/buyer access rather than translating into broader sector growth. In the prior cycle (2018–2021), an independent review found visible community-level outcomes across sites, such as improved forest productivity and conservation practices, livelihood opportunities via producer groups/value chain support, and evidence that community forest entities and enterprises were becoming institutionally and financially resilient. Tens of millions USD have been leveraged by the work from complementary sources, as WWF Finland funding is contributing to larger conservation interventions. (WWF, 2021, 2024; Eklöf, 2022).

Across various cases, results hinged on core design assumptions that did not always hold. In Lao PDR, SUFORD missed poverty-reduction targets because policies pulled in opposite directions. Production forest areas were promoted under short-range result 3, while national policy prohibited communities from earning income from production forests, even when harvests were sustainable, which blocked the short-range result to medium-range result link (Mikkola et al., 2019). In Zambia, livelihood impacts remained low because forest-product value chain development was insufficient and DFONRMP ended prematurely, which curtailed downstream market work under medium-range result 2 (FCG, 2020).

Enabling-environment and market frictions further hindered translation into diversified, economy-wide value chains. In Tanzania, production was systemised through improved germplasm and nurseries, better silviculture and harvesting, large seed orchards, and stronger grower organisations such as Tanzania Tree Growers Association Union with revised governance manuals. However, the legal timber-trade chain remained cumbersome, with at least 18 trade barriers identified from harvest to market, which raised micro, small, and medium-sized enterprise costs and risks and dampened legal trade. (Interviews). Analogous constraints hindered downstream uptake elsewhere. In Kenya, a nationwide logging ban until 2012 meant sawmilling capacity recovered only slowly after lifting, limiting downstream absorption even where producer groups were organised and market links were piloted (MFA, 2016b; Topper and Frestadius, 2019). External context and programme duration also mattered. Some enterprises were seasonal, market links were weak, inputs were constrained and village-level banking was absent. Evaluators recommended larger community forests with concessions, payments for ecosystem services, and promotion of non-timber forest products. Regional public-private partnership pilots in the Mekong and Latin America demonstrated proof of concept, but most ended before income-generating stages in complex settings, and only one Central American case (FINNFOR) performed satisfactorily on livelihoods, value chains or national-level payments for environmental services. These findings underline the need for adequate duration and resourcing to progress from pilots to sustained outcomes (FCG, 2020; Topper et al., 2017).

Community-based forest management is not cost-free for governments or the local communities. Evidence suggests a need to increase community returns from sustainable offtake and to communicate the ‘use it or lose it’ principle to funders, decision-makers and the public. Carbon offsetting schemes that focus only on conservation and do not invest in timber-based community enterprises can be harmful. Although value chain interventions showed mixed sustainability and impact, value chain development remains necessary to generate resources for community-based forest management and conservation. Past investments in Tanzania are likely to produce durable

results because previous bilateral interventions provided a solid foundation for the new FORLAND programme (FORVAC, 2024).

Finding 8. Finland strengthened policy and legal frameworks for sustainable Forest, Ecosystems and Biodiversity management, with uptake where procedures, mandates and budgets aligned. Where policy coherence or funding lapsed, downstream livelihood gains were partial.

Finland has generated strong progress in several partner countries in revising policies and laws together with strengthening capacities of stakeholders at national, regional and local levels.[14] Overall, the bilateral projects in Kenya, Laos, Tanzania and Zambia stand out in this respect. Public institutions at all levels benefited from the capacity-building and policy-development results. The Forests, Ecosystems and Biodiversity portfolio demonstrates that bilateral cooperation projects could effectively deliver on sector reform objectives and foster a strong sense of ownership. Technical assistance was consistently noted in evaluations and interviews as a substantial contribution to the achievements of these programmes (see also Finding 15).

Policy and legal reforms most clearly materialised where community forestry was formalised and proceduralised. In Zambia, a statutory instrument, a national seven-step procedure and community-forest by-laws unlocked rapid expansion of Community Forests (over 970,000 ha in four years, see Finding 1) alongside reported reductions in illegal logging and clearing. DFONRMP itself secured legal agreements over 32,707 ha before the programme ended (FCG, 2020). Kenya consolidated its framework through the Forest Conservation and Management Act (2016), defining conservation, use rights and community participation, paired with organisational upgrades to knowledge and information management. Evaluators credited the Miti Mingi Maisha Bora project with facilitating policy and legislative measures and associated organisational and capacity reforms within Kenya Forest Service, including commercialisation of non-wood forest products and plantation/out-grower schemes aligned with Vision 2030 (Topper and Frestadius, 2019; MFA, 2016b). In Tanzania, guidelines for forest management plans, participatory village land-use planning tools and a Forest Law Enforcement, Governance and Trade review strengthened the enabling environment for community-based forest management and compliant value chains (FORVAC, 2024; PFP, 2018).

In Lao PDR, the village-based model pioneered by the Forest Management and Conservation Project (in Lao PDR, 1995-2000) informed SUFORD's participatory sustainable forest management. SUFORD secured approved plans for all supported Production Forest Areas and improved timber-revenue sharing and village-forestry rules, showing how policy change, coupled with district/village capacity, institutionalised practice (Mikkola et al., 2019). Finland provided technical assistance. Kosovo harmonised policy and strategy, advanced the Law on Forests, and operationalised the Kosovo Forest Information System to support evidence-based supervision and planning (FAO, 2019; FAO, 2020).

Regional initiatives demonstrated coordination beyond single countries. BioCAN reactivated the Andean Committee on Genetic Resources and Traditional Knowledge for Nagoya Protocol implementation, tightened controls on illegal wildlife trade and integrated biodiversity information platforms with a strong gender focus, although dissolution of CAN (the Andean Community)'s Environment Unit/Andean Committee on Genetic Resources and Traditional Knowledge in 2013

14 Additionally, MFA has been funding a training on international environmental law and diplomacy for the past 20 years. Stakeholders noted it having an important role in supporting developing country parties in environmental governance and implementation of international agreements.

curtailed continuity (Oksanen et al., 2015). FORMIS II in Vietnam illustrated how a national digital system, once embedded in legislation and linked to REDD+/Forest Law Enforcement, Governance and Trade (FLEGT) processes, generated transnational benefits through interoperability and data-sharing norms. The final evaluation as well as interviews reported strong impact on the availability of standardised nationwide data and transformed sectoral reporting and use (Williams et al., 2019; Interviews). Data-to-policy feedback loops underpinned several reforms. Multi-purpose national forest inventories informed Ecuador's draft Environmental Code/Forest Law and Tanzania's NAFORMA-driven revision of the National Forestry Programme to address a quantified 19.5 million m³ wood deficit (FAO, 2015). At global level, Forest Resources Assessment-2025's online reporting platform adoption (see Finding 5) improved traceability, harmonised UNFCCC/SDG/UN Economic Commission for Europe-Forest Europe reporting and strengthened the defensibility of national statistics – these are changes that FAO attributes to Finnish support that reinforced domestic policy credibility and access to results-based finance (FAO, 2024; Interviews).

As discussed under Finding 7, where policy coherence, budget continuity or institutional mandates wavered, reforms stalled or shifted to other actors. Also in Vietnam, open-data functions lapsed post-FORMIS II, underscoring how budgeted maintenance and transparency policies condition long-term governance benefits (Williams et al., 2019; Interviews). Overall, where rights, clear procedures and enforcement tools aligned, laws translated into practice; where they did not, effects were partial.

The evidence confirms the theory of change results chain: formalising community forestry and codifying step-by-step procedures advance short-range results 2 and 4, which – when paired with technical assistance and capacity building – translate into medium-range result 1 and 2. Where mandates, budgets and policy coherence held, these short-range result to medium-range result gains carried through to long-range results 1 and 4. Where they faltered or programming ended early, effects stalled at policy level, exactly the risk flagged in the theory of change assumptions on sustained budgets, open information and supportive policy environments.

WWF evidence aligns with the theory of change pathway from policy influence and governance capacity (short-range results) to landscape planning and improved management (medium-range results) and documents local livelihood co-benefits (long-range results). Across 2022–2024, WWF-supported landscapes formalised and operationalised reforms at scale, with 62 policies, decisions and investments influenced in the current cycle, 94 land-use/forest/watershed plans developed or supported, 35 nature-based /adaptation policies or initiatives adopted, and 347 local CSOs plus 2,805 duty-bearers capacitated to apply new rules in practice. Regionally, partners helped secure the East African Community Forest Policy/Strategy and a Southern African Development Community mechanism for seized timber stockpiles, alongside the Zanzibar Declaration process and ongoing timber-trade forums, tightening legality and cross-border cooperation. Nationally, governments adopted 'zero poaching' strategies, updated forest legislation (e.g. Laos, Mozambique), passed a new environment and natural resources law (Nepal), and strengthened regulations for community forest management in state forests (Indonesia). Livelihood translation accompanied these reforms where procedures and mandates were clear (Finding 7), yet reviews noted that benefit-sharing distribution was seldom tracked (Finding 4), signalling how incoherent policies or truncated programming can blunt downstream welfare effects. (Eklöf, 2022; WWF, 2024).

Finding 9. Finnish support has delivered strong results in the creation of forest management information systems that have helped to transform forest management outcomes in multiple contexts.

Building on its strong institutional and technical expertise, Finland has strengthened partner-country capacities, tools and methods for forest data management through forest management information systems (see also Finding 11 in Section 4.2 on most effective approaches). Bilateral and ICI projects in Vietnam and Tanzania, together with FAO's global programmes, delivered strong results in this area. Across contexts, forest management information systems investments translated into more rules-based, data-driven forest governance, consistent with the theory of change pathway from short-range result 1 (information systems) to medium-range result 1 (evidence-based management) and onwards to long-range outcomes.

In Vietnam, Finland established a country-wide forest management information systems (FORMIS) and advocated opening raw data to the public. FORMIS I and II converted the paper-based monitoring and reporting of forest change at the Forest Administration of the Ministry of Agriculture and Rural Development to a fully digitised and information and communication technology (ICT)-based system using the FORMIS platform and forest resource management system, and scaled from pilots in 10 communes to several thousand communes across 547 districts in all 60 provinces. More than 2,000 officials were trained and about 1,300 remained active Forest Resource Management System users, with rangers recording geo-referenced events (imagery and metadata) that flowed to provincial databases (Williams et al., 2019, Interview). The PFG project extended its use to community level. Vietnamese stakeholders confirmed that to this date, the information available through FORMIS has been vital for a wide range of national and international forestry initiatives, most notable of which include the Forest Law Enforcement, Governance and Trade and Reducing Emissions from Deforestation and Forest Degradation (REDD+) processes – both having considerable requirements for data and monitoring. FORMIS is widely regarded as one of the most successful and sustainable MFA interventions in the sub-sector. However, its maintenance budgets lagged, the public data-sharing application lapsed after FORMIS II, and sweeping administrative reforms in 2025 will require a comprehensive redesign of the platform, creating obsolescence risk without renewed investment and policy support (see also Finding 5; Williams et al., 2019; Interviews).

Finland has supported FAO's programme in forest management and Forest Resource Assessment both at global and country levels with many good results in forest management information systems. The Finnish contributions have allowed FAO to strengthen the capacity of developing countries to gather information on forest resources and land-use change, forest uses and users and to formulate more consistent land-use and livelihoods policies, not only to reduce an important cause of climate change, but also to mitigate its impacts (FAO, 2012). In Tanzania, NAFORMA provided the first multipurpose national forest inventory data, also covering forest carbon and non-timber forest products. Nationwide thematic maps were generated, showing the spatial and statistical distribution of land use and land cover classes, giving a potential for integration of forest resource management in sustainable development processes. These decision-grade statistics quantified a 19.5 million m³ annual wood deficit and informed the revision of the National Forestry Programme (2015–2024) toward plantations and woodlots. The programme built partner-agency skills in planning, fieldwork and analysis, and put in place the units, procedures and tools needed to take up and sustain external technical assistance. The in-country consultations in Tanzania (2025) confirm that the forest resource data produced by the NAFORMA project has been useful, but it needs urgent updating.

The ICI project INFORES (2016 to 2019) built on the achievements of NAFORMA and successfully collected data on forest stocking density (biomass and carbon) by region, eco-zone and species. The data has enabled the National Carbon Monitoring Centre to prepare the national Forest Reference Emission Level as a baseline for monitoring, reporting and verification required by the UN-REDD+ initiative, as well as supported national reporting required under the Paris Agreement. It has also enabled the Sokoine University of Agriculture to conduct research on forest structure and composition and has assisted the Tanzania Forest Services Agency to conduct analysis on regeneration constraints and opportunities in dryland forest ecosystems (miombo woodlands) – linking effectively to the theory of change short-range result 6. Further, the data has supported the Ministry of Natural Resources and Tourism to review the National Forest Policy (1998) and the Ministry of Lands and Urban Settlement to develop the national land cover/use maps (medium-range result 1). It has also enabled the Tanzania Forestry Research Institute to provide access to the forest data collected to internal and external researchers. The in-country consultations in Tanzania confirmed that the complementary INFORES and NAFORMA interventions improved national monitoring, reporting and verification capacity, with Tanzania Forest Services Agency being highly satisfied with Finnish-funded secondment, indicating strong value of the embedded technical assistance (see Finding 15; Interviews). However, despite the positive results and appreciation by the Tanzanian counterparts, interviewees noted that NAFORMA II remains unfunded at the time of reporting, constraining continuity.

Finding 10. Beyond dedicated forest management information systems projects, Finland's support strengthened countries' capacities for forest assessment, spatial mapping and tenure information systems, enabling more evidence-based planning, supervision and traceability.

Capacity was built through spatial mapping and tenure information systems. In Kosovo, the FAO Forest Policy project institutionalised participatory planning and deployed the Kosovo forest information system to support evidence-based supervision and field-level management (FAO, 2019). In Tanzania, bilateral programmes backed village land-use and forest management plans and piloted a mobile 'certificates of customary right of occupancy' application to streamline tenure security for tree growers (PFP II, 2024; FORVAC, 2024). MFA also supported the forest governance initiative, commonly known as Mamamisitu in Swahili, to pilot the check point information system, i.e. a forest resources management information system. This was a tool to monitor movement of timber consignments and reduce illegal trade. Tanzanian stakeholders described that with seed support from Finland, the forest resources management information system moved from pilot to full national roll-out by the Tanzania Forest Services Agency, enabling real-time timber-consignment tracking, online transit passes and improved oversight, alongside reported e-revenue gains. ZAPROPA is the only private sector intervention in the Forests, Ecosystems and Biodiversity portfolio. The objective was to develop a forest management software fit for Zambian context and sign a long-term license agreement with the Zambian licensing partner Zambia Timber Auction Floor. The potential customer groups were expected to be small to medium-scale forest concession holders, local entrepreneurs and forest cooperatives, and government agencies (Forestry Department). The software was considered a way to build capacity for tree inventory planning in Zambia. However, it was never launched because of a change in the priorities of potential users. This also undermined hopes of commercial success in the country (Arbonaut, 2024; Arbonaut and ZTAF, 2024).

In Lao PDR, support alongside SUFORD established a Department of Forest Inspection. The SNGS project set up a national geodetic network, improving law enforcement and spatial planning. The country was photographed and mapped at near-national scale, with a national committee promoting mapping/database standards and data exchange. Technical training covered digital

photogrammetry, ortho-rectification, 2D/3D mapping, cartography, database/web development, global positioning system (GPS) surveying and digital levelling, transforming spatial-planning capabilities (Mikkola et al., 2019).

In addition to the systems, knowledge generation and transfer was also carried out. The first phase of FOPER developed an international master's degree programme in forest policy and economics, which was consolidated under FOPER II in West Balkans (Sterland et al., 2014). In Tanzania, PFP and PFP II invested in in-situ training as well as vocational education and training by equipping the Forest Wood and Industry Training Centre and developing a curriculum on vocational education that the Forest Wood and Industry Training Centre adopted (PFP, 2018). PFP II supported activation of pedagogy and modernisation of professional skills in three Tanzanian forestry training institutes. Finnish expertise from Häme University of Applied Science was used to provide the services (PFP II, 2024). Participatory research and knowledge systems were strongest through ICI, CSO, and FAO channels. The evaluations show that Finnish CSOs have achieved strong results at building the capacities of civil societies, indigenous peoples and local communities (Osma Advisory, 2021, 2024; Coventry and Toikka, 2020; Chapman and Saarilehto, 2017).

Networking, coordination and knowledge sharing between stakeholders were enhanced (short-range result 6). INFORES in Tanzania expanded access to decision-grade data and maps and this in turn catalysed new research lines. It also opened opportunities for policy dialogue and co-operation with Finland, other donors, international organisations, and non-state actors (Caldecott et al., 2020). In Zambia, a CSO E-Hub established in the Civil Society Environment Fund Phase II (CSEF2) built coordination, networking, and information-sharing capacity across environmental CSOs, which stimulated advocacy for legislative reform (FCG, 2020). Several regional projects in the Mekong, Andean region, and Central America built knowledge platforms but did not translate this into policy dialogue and reform at scale (Topper et al., 2017).

Finding 11. Forestry projects supported by Finland lacked well-documented and consistent geospatial data.

The geospatial analyses of the FORVAC and PFP projects in Tanzania were constrained by significant data quality and documentation issues, which limited the ability to independently validate the reported geographic extent of project impacts. In the case of FORVAC, the polygon data of village land forest reserves contained a range of inconsistencies, including missing file components, empty or corrupted files, duplicated and overlapping polygons, topological errors such as self-intersections, and naming discrepancies between geospatial layers and the official project report (see Table 9 in Annex 4). Despite extensive data cleaning, only 67 of the 73 village land forest reserves listed in the final report could be confidently included in the analysis, preventing a full assessment of the reported project coverage.

A similar scenario was faced regarding the PFP woodlot dataset, where 1,298 polygons (14.43% of the dataset) overlapped with others, risking double counting of the total planted area. Additional errors included self-intersecting polygons, duplicated identifiers, repeated polygons, misplaced woodlots, and inconsistent formatting in attribute information such as village names, gender of beneficiaries, tree species, and planting years (see Table 13 in Annex 5). After systematic correction and standardisation, 8,809 woodlots could be retained for analysis out of the 8,894 reported, again meaning that the official totals could not be fully validated.

These deficiencies point to a systemic gap in geospatial data management across both projects. The absence of consistent metadata standards, file version control, naming conventions, and

quality assurance procedures meant that critical information was either missing, inaccurate, or unverifiable. Although corrective measures enabled a consistent dataset for analysis, they introduced uncertainty and reduced the replicability of findings. As a result, opportunities for transparent, long-term monitoring of forest-related interventions are significantly constrained.

4.2 Most effective approaches

An 'approach' is a key method or tactic – a portable element of a strategy. To qualify as 'most effective' in this evaluation, an approach must be judged to be: (i) strongly effective, impactful and sustainable;[15] (ii) in line with the theory of change; and (iii) strongly cost-effective.

Summary answer to EQ 1.3 – Most effective approaches

Rights-based community forest management proved effective, with formalised tenure, mapped boundaries and clear village procedures reducing illegal use and supporting credible supervision. Forest loss reduced and results endured where local institutions were resourced. Strengthening state capacity and legal frameworks anchored local practice in law, mandates and budgets, translating community rights into routine compliance and improving durability beyond project cycles. A data-first approach – participatory inventories with operational forest management information systems and traceability – made planning and enforcement transparent and repeatable, aligned local decisions with national reporting, and sustained outcomes when systems were institutionalised and maintained. Effectiveness and sustainability increased further where these approaches were sequenced and paired with Institutional Cooperation Instrument projects alongside bilateral programmes, which convened capable partners, reinforced forest management information system uptake, and built lasting capacity.

Finding 12. Most effective approaches include: (i) community-based forest management; (ii) forest management by state institutions; and (iii) targeted core financing of international institutions and Finnish non-governmental organisations.

Community-based forest and ecosystem management has been a significant and effective approach supported by Finland. It is built as a bundle of mutually supportive actions that strengthen local tenure security, promote participatory forest planning and inventory, build the capacity of community institutions, facilitate cooperation between communities and government foresters, and develop wood and non-timber forest product value chains for local benefit.

Enhanced tenure security was the foundation. Finnish-supported programmes helped create legally recognised community forests and forest areas through statutes and formal agreements, providing communities with clear rights and responsibilities. These legal frameworks gave local stakeholders authority over forest use and created incentives for sustainable management.

15 A strongly **effective approach** is one that reliably delivered valuable outcomes, with clear causal contribution; results were consistent, replicable, and aligned with the theory of change. A strongly **impactful approach** is one that contributed to significant positive change, with evidence of influence on broader systems, policies, or behaviours in line with the theory of change. A strongly **sustainable approach** is one that had consequences that were likely to continue producing results without external support, due to strong local ownership, institutionalisation, financial viability, or policy uptake.

Participatory planning and inventory ensured sustainable use. Community forestry interventions supported the preparation of participatory forest management plans and village land-use plans that zoned production and protection, set harvest rules, and defined transparent benefit-sharing. Multipurpose national forest inventories and forest management information systems were sometimes integrated, allowing communities and district authorities to base decisions on reliable data.

Capacity building of local institutions was central to the model. Village-level committees, such as Village Natural Resource Committees in Tanzania or Community Forestry Management Groups in Zambia, were elected and accountable to village councils. They were supported by district technical teams, training institutes and producer organisations. These institutions managed day-to-day activities including patrols, early burning, harvesting supervision, and compliance monitoring.

Cooperation with government foresters reinforced the approach. National forestry departments and local forest officers worked alongside community institutions, providing technical guidance and legal oversight. This partnership created more defensible governance systems, embedded community rights within national frameworks, and improved enforcement against illegal activities.

Livelihood and value chain development completed the package. By enabling communities to harvest timber and Non-Timber Forest Products legally, Finnish-supported programmes generated village revenues, employment, and household income. Reported results included millions of Tanzanian shillings invested in social services, jobs created for men and women, and improved access to health and education. Communities themselves reported reduced illegal use, fewer incidents of encroachment, and stronger conservation outcomes linked to visible development dividends.

Taken together, these elements – rights, participatory planning, local institutions, cooperation with state agencies, and value chain benefits – operationalised the theory of change from inputs to local governance and sustainable use. The community-based forest management approach proved strongly effective, impactful, and sustainable, aligning with short-range result 2 (local institutions) and short-range result 4 (stewardship), while also delivering medium-range result 1 (institutional practice) and long-range result 1 (conservation) and in some cases long-range result 2 (poverty reduction). It represents the characteristic Finnish modality in community forestry.

Forest management by state institutions has been another effective approach supported by Finland. It encompasses measures that strengthen state capacity for managing forest resources, including the development of forest management information systems, reform of policy and legal frameworks, investment in forestry training facilities, and support to participation in international arrangements such as Forest Law Enforcement, Governance and Trade and REDD+. This approach has been effective where long-horizon bilateral projects laid the foundations for institutional systems and where multilateral partnerships scaled up tools and standards.

Forest management information systems were the most visible and successful of these measures. Evidence shows that Finland has delivered strong results in building the capacities, tools and methods of partners countries in forest data management (Finding 9).

Policy and legal reform were another important channel. Finnish programmes contributed to more coherent forest legislation and management frameworks, for instance in Laos and Tanzania, where legal provisions for participatory forest management and community rights were consolidated. These reforms created the legal environment that enabled both state-led and community-led forest governance.

Forestry education and training facilities were also strengthened. For example, the FOPER project developed an international Master's degree in forestry policy and economics and upgraded regional training institutions, contributing to a cadre of professionals able to sustain reforms and engage in international cooperation.

International participation was enhanced. By strengthening forest information systems and legal frameworks, Finland helped partner countries to comply with international reporting requirements and participate in arrangements such as Forest Law Enforcement, Governance and Trade licensing and REDD+ negotiations. These steps expanded opportunities for accessing global markets and climate finance.

Taken together, forest management by state institutions operationalised the theory of change at multiple levels: short-range result 1 (enhanced data capacity), medium-range result 1 (institutional practice), and long-range result 3 (international cooperation). It proved cost-effective through open-source tools and training systems that continue to serve state agencies, and sustainable where governments adopted and budgeted for the systems created.

Targeted core financing of international institutions and Finnish non-governmental organisations has been an effective approach supported by Finland. It helped to enable trusted partners to deliver biodiversity protection, ecosystem restoration, and community forestry at scale, while also generating global public goods and knowledge platforms.

International institutions used Finnish core support to develop tools and platforms that national agencies adopted worldwide. FAO, with Finnish backing, created and scaled Open Foris tools and the Forest Resources Assessment-2025 online reporting platform, now widely used by forest administrations to meet international reporting standards and support REDD+ readiness. This produced durable global public goods that multiplied the reach of bilateral investments.

Finnish non-governmental organisations, supported through programme-based core financing, translated community forestry and conservation principles into tangible results on the ground. The programmes of WWF Finland and Siemenpuu Foundation reinforced community rights, supported biodiversity outcomes, and extended Finland's presence into areas where bilateral cooperation was not active.

Core financing was effective because it gave partners flexibility to respond to evolving challenges while maintaining focus on long-term objectives. Institutions used predictable funding to leverage additional resources, engage in policy dialogues, and anchor conservation efforts in multilateral and grassroots networks. Finnish contributions, though modest in scale compared to total partner budgets, were often catalytic in sustaining programmes and ensuring continuity.

Taken together, targeted core financing enabled Finland to achieve results beyond the reach of bilateral projects alone. It strengthened multilateral standards, expanded the hectares under sustainable community management, and enhanced biodiversity protection. This approach operationalised the theory of change at long-range result 1 (conservation) and short-range result 4 (stewardship), while reinforcing international cooperation (long-range result 3) through well-placed contributions to credible institutions. It proved cost-effective by leveraging broader resources and sustainable through the institutionalisation of programmes within global and civil-society partners.

4.3 Finland's added value in the results

To assess Finland's added value, the evaluation adopted certain criteria to support its findings under this section. They are: (i) the unique or complementary 'strategic' value of Finland's cooperation compared to its peers in this sub-sector that others did not bring (i.e. what was distinctive about Finland's cooperation in the sub-sector); (ii) the 'operational' value of Finland's cooperation (i.e. the way Finland has used its financial instruments available to develop long-term partnerships dedicated to capacity and institutional building at the public, private and non-governmental levels; (iii) the 'normative' value of Finland's cooperation (i.e. capacity to influence policy reform).

Summary answer to EQ 1.4 – Finland's added value

Finland's context-specific added value lay in exporting world-class forest informatics and measurement know-how with a clear demand by partners – national forest management information systems platforms and global, open tools that standardised data, strengthened compliance/monitoring, reporting and verification and, in countries like Tanzania and Vietnam, continued to deliver beyond project life. This distinctive technical credibility, recognised by governments, FAO and peers, made Finland the trusted "go-to" actor when robust, interoperable information systems and forest inventory capacity were prerequisites for results.

Operationally, Finland generated results by combining instruments and partnerships. Bilateral + Institutional Cooperation Instrument + FAO (+, at times, Finnfund) were sequenced to build institutions, methods and skills, with clear country tailoring (e.g. Kenya's IC-FRA feeding the Forest Information System; Tanzania's INFORES building on NAFORMA and linking with PFP/FORVAC; Vietnam's FORMIS complemented by community-level piloting via PFG). Where mature relationships and trust existed, most visibly in Tanzania, Finland could broker coherence across public programmes and private investees (e.g. TOSP).

Normatively, Finland's comparative advantage was more indirect and concentrated in multilateral arenas than in bilateral policy reform. By hard-wiring monitoring, reporting and verification and e-tracking (e.g. FREL, forest resources management information system) into partner systems, Finland enabled policy implementation and compliance pathways even when it was not fronting the dialogue. Normative influence is practiced chiefly through multilateral governance and agenda-setting on climate/biodiversity. However, Finland's marginal contributions and diminishing ODA is feared to limit this influencing avenue.

Finding 13. Finland's distinctive added value in Forests, Ecosystems and Biodiversity lay in building forest information systems that endured beyond project life – national platforms and widely adopted global tools that standardised data, strengthened compliance, and unlocked results-based finance.

Evidenced by interviews and desk research, Finnish institutions and experts enjoy a strong reputation in global forestry and biodiversity networks. Finland has drawn on a long tradition in forest assessment and monitoring and exported this know-how through development cooperation. FAO confirms that Open Foris, originally launched with financial support from Finland, has grown into a widely used, open-source suite for forest and land monitoring (interviews; FAO, 2015; FAO, 2025). In Vietnam, an independent evaluation judged the Finnish-backed FORMIS a "major achievement" valued by government and partners. The in-country consultations confirmed that and indicated the system continued to be used in daily operations (Williams et al., 2019). In Tanzania, the forest

resources management information system e-tracking platform (now at version 4.0) is deployed by the Tanzania Forest Services Agency for permits and movement control, evidencing a direct link from information systems to operational compliance (Remme et al., 2023). Interview evidence consistently confirmed Finnish strengths in forest informatics and forestry more broadly. However, the retirement of senior experts and the declining prominence of forest sector focused development cooperation have not been matched by a sufficient pipeline of new professionals, raising concerns about the future depth of Finnish expertise to be used globally (interviews).

Finnish technical competencies were particularly well utilised in FORMIS and PFG in Vietnam, and SUFORD programme in Lao PDR. Partners appreciated Finnish expertise in forest inventory and forest information systems (Mikkola et al., 2019). FAO projects also benefited from Finnish experts in project management, technical development, and capacity-building (FAO, 2015; FAO, 2021; Interviews). Finnish forestry expertise was recognised from the Western Balkans FOPER programme to forestry initiatives in Tanzania. Study tours to Finland served as an important element for capacity building, although they did not translate into sustained business partnerships due to limited follow-up (Sterland et al., 2014; Sterland et al., 2023; Nikolovski and Krasniqi, 2012).

Public institutions and research organisations were more effective than other channels in delivering Finland's results, especially via ICI projects. Luke has been a key ICI partner and an official FAO partner since 2017, working together to strengthen sustainable forestry practices and integrated forest resources management (Luke, 2021). The ICI portfolio demonstrates strong delivery where Finnish institutions have a clear comparative advantage, as with INFORES in Tanzania (Caldecott et al., 2020). Several sources point to unrealised potential to integrate biodiversity conservation more fully into productive forest management, particularly in bilateral projects in Tanzania, indicating headroom to broaden Finland's value proposition beyond informatics into applied biodiversity outcomes (Koponen, 2011; Remme et al., 2023).

Finding 14. Finland's development cooperation in the Forests, Ecosystems and Biodiversity sub-sector demonstrated synergies and complementarity between bilateral programmes and Institutional Cooperation Instrument projects, especially in Vietnam, Kenya and Tanzania.

Pairing the ICI modality with bilateral projects improved effectiveness and complementarity, particularly in the forest management information systems portfolio. Several good examples were evident in Kenya, Vietnam, Tanzania and in FAO initiatives. This approach, commonly used by the MFA in the 2010s, was strongly effective in bringing partners together on an equal footing and enabled partner-country organisations to build capacity to address national priorities in forestry and related sectors. The projects convened relevant government institutions, non-state actors, and education and research establishments, and the ICI–bilateral pairing led to more sustainable forest management information systems results. Bilateral and ICI projects implemented in partnership with forest departments and research institutions in Vietnam and Tanzania, and FAO's global programmes have delivered the strongest and potentially impactful results. These cases also demonstrate Finnish added value.

In Kenya, a bilateral project (Miti Mingi Maisha Bora – Support to Forestry Sector Reform) and an ICI project (*Improving capacity in forest resources assessment,* IC-FRA) shared objectives on improving forest assessment methodologies and tree growth and biomass modelling. National Forest Inventory data was collected under the IC-FRA project and was fed into the Forest Information System. The IC-FRA also contributed to Miti Mingi Maisha Bora programme results in the form of partnerships and linkages between institutions in Kenya and Finland to promote knowledge and

information management. It also produced a Field Manual for Tree Volume and Biomass Modelling, a Field Manual for LiDAR Assisted Estimation of Forest Resources in Kenya and a Technical Report on LiDAR Assisted Estimation of Forest Resources in Kenya (Topper and Frestadius, 2019).

Tanzania offers a similar example with two bilateral programmes (PFP/PFP II and FORVAC), an ICI project (INFORES) and the Finnish-funded country component of the FAO–Finland Forestry Programme (NAFORMA). A model was created in which Finland's bilateral programme (PFP II) and Finnfund investees worked together in the Tree Outgrowers Support Programme (TOSP), with companies supplying the PFP from their outgrower schemes (see Finding 7). This constitutes an achievement in coherence, coordination and collaboration between Finnish modalities and instruments. Internal documentation indicates this linkage was at least partly deliberate, reflecting conscious efforts to replicate PFP-supported approaches with private-sector partners. Lessons emerging from this experience suggest that such public–private collaboration requires sufficient programme maturity and solid trust with partners before major joint commitments are feasible, and that reaching this point takes time.

The ICI project INFORES was building on achievements of NAFORMA in Tanzania and successfully collected data on forest stocking density (biomass and carbon) by region, ecozone and species. The data has enabled the National Carbon Monitoring Centre (NCMC) to prepare the national Forest Reference Emission Level (FREL) as a baseline for monitoring, reporting and verification required by the UN-REDD+ initiative, as well as supported national reporting required under the Paris Agreement. It has also enabled the Sokoine University of Agriculture to conduct research on forest structure and composition and has assisted the TFS to conduct analysis on regeneration constraints and opportunities in dryland forest ecosystems (miombo woodlands). Further the data has supported the Ministry of Natural Resources and Tourism (MNRT) review the National Forest Policy (1998) and the Ministry of Lands and Urban Settlement develop the national land cover/use maps. It has also enabled the Tanzania Forestry Research Institute (TAFORI) to provide access the forest data collected to internal and external researchers.

Collaboration between bilateral projects and CSOs was also evident in the portfolio. In Vietnam, to apply and test FORMIS (a bilateral programme) at the community level, an international non-governmental organisation project implemented by ActionAid Vietnam (PFG) were added. Some synergies are also evident in the CSO side. For example, WWF Finland's work has and has had synergies with the bilateral forest programmes in Tanzania and in Nepal, and cooperation with Finnfund in Tanzania regarding timber value chain and FSC certification.

Finding 15. Finland's added value lay in credible technical leadership and long-standing partnerships – especially in Tanzania, where it was the "go-to donor" – while often letting others lead policy dialogue. It delivered influencing in multilateral fora, punching above its financial weight.

Finland's reputation and technical depth in Forests, Ecosystems and Biodiversity were consistently recognised by partner governments and donors, particularly in Tanzania, where Finland was viewed as the "go-to donor" with leadership in gender equality and forestry agendas, and even approached by the EU for "inspiration" on programming and partners. However, Finland generally allowed other partners to front policy dialogue while it implemented targeted solutions that others could use in policy discussions, rather than leading the policy push itself (Mackie et al., 2022; Interviews). This was echoed by the Forests, Ecosystems and Biodiversity portfolio, where influencing/policy reform was not the main focus of the interventions reviewed. Only a joint World Bank project (SUFORD) had legislation-related goals. This likely explains why influencing seldom surfaced in interviews.

Institutionally, Finland's negotiating capital is distributed across Finnish government institutions, namely, between the MFA, the Ministry of Environment, and the Ministry of Agriculture and Forestry. Interviews from all sides described good coordination between the ministries. Domestic arrangements to coordinate international forest positions exist, e.g. the International Forest Policy Network convened by the Ministry of Agriculture and Forestry to share information, align national objectives, and prepare positions for fora such as FAO's Committee on Forestry. However, while such domestic coordination arrangements exist and inter-ministerial cooperation is strong, a lack of dialogue and coordination resulting to weak communication between Finnish stakeholders was also voiced by some stakeholders.

Within the EU external action arena, an independent evaluation (Mackie et al., 2022) did not identify specific and significant Forests, Ecosystems and Biodiversity influencing outcomes clearly attributable to Finland. MFA's EU influencing plans contained only a few forestry points. Where forestry did appear, plans focused on the he Neighbourhood, Development and International Cooperation Instrument-Global Europe funding, forestry's eligibility under the European Fund for Sustainable Development Plus (EFSD+), and eliminating deforestation from supply chains. Mixed country patterns were observed: in Tanzania Finland's credibility positioned it to influence EU Delegation programming, whereas in Nepal Finland declined an EU invitation to support forestry, contributing instead via water, sanitation and hygiene and climate. At EU level, Finland was active during its 2019 Presidency in advancing Council Conclusions on stepping up EU action on forests, but its focus remained primarily on internal EU policy with limited parallel push on development policy aspects of global deforestation (Mackie et al., 2022).

Independent evaluations concluded that Finland's influence was strongest with and through multilateral partners and often disproportionate to funding volume, anchored by core contributions, leadership roles and reputational capital (Palenberg et al., 2024; Mackie et al., 2022). See Finding 6 on the influencing results by the multilateral partners. Finland is a member of the High Ambition Coalition for Nature and People that championed the '30x30' target in the Global Biodiversity Framework, providing agenda-setting voice. Finland has also been active in influencing UNEP and IUCN, both expressing positive views of Finland, noting influence beyond the scale of its financial contributions (Interviews). At IUCN, Finland exerts influence as a member state and through the national IUCN Committee. Influence is exercised via voting, motions and input to strategic documents and the World Conservation Congress (MFA, 2025).

Finland's Green Climate Fund and GEF replenishment pledges were not just financial acts but mechanisms for maintaining standing and credibility in funds central to UNFCCC/ Convention on Biological Diversity. Through its contribution to GEF, Finland is in the council and the constituency with the Netherlands and Estonia, sustaining voice in governance (institutional note), while GEF implements biodiversity/climate programming aligned with the Global Biodiversity Framework and chemicals, waters, land and forest focal areas (Interviews). Interviews confirm the findings of previous evaluations (Savage et al., 2023) that multilateral partners value Finland's proactive engagement and quality assurance, describing an "outsized role" relative to funding and particular strength in mainstreaming gender and rights into climate finance, often alongside other Nordics.

In the era declining ODA, it is important to acknowledge the political influence Finland still has in many environmental processes. At the same time, in order to maintain this political influence, at least some financial contribution would be needed for the main multilateral environmental funds (such as GEF and Green Climate Fund), organisations (such as UNEP, IUCN) and for multilateral environmental agreements (Convention on Biological Diversity, UNFCCC, UNCCD etc.). Finland has been keen on prompting multilaterals to develop their ways to measure and communicate

results. Stakeholders interviewed share a worry over the reduced funds and how that could, over time, diminish Finland's voice despite strong technical regard ("Noblesse oblige").

Notwithstanding the strengths, systemic constraints limited the conversion of technical assets into consistent policy influence. The Evaluation of International Climate Finance (Savage et al., 2023) found Finland lacked a clear overarching strategy for prioritising/allocating climate finance; instrument siloing and capacity constraints hindered synthesis, and synergies between climate finance and climate diplomacy were "not well exploited," prompting recommendations for greater integration and bolstered capacity for multilateral influencing. OECD Development Assistance Committee work similarly highlighted coordination/coherence as an ongoing improvement area, echoing earlier oversight on multilateral coordination (OECD, 2024).

4.4 Markets, competition and demand for Finnish private sector

Summary answer to EQ 2.1 – Demand and competition for Finnish private sector

Digital forest information and compliance technology is in clear demand across East Africa, Southeast Asia and parts of Latin America and the Caribbean, with demand increasing and expanding to traceability because of the requirements linked to the European Union Deforestation Regulation. In addition, in countries where donors are active in the sector, community-based forestry and ecosystem management services show continuous demand. Finland should approach these demands focusing on its competitive advantage of advanced technical systems and participatory governance and making use of the expanding blended finance and concessional financing mechanisms.

Where GEF/UNEP (and other multilateral organisations) have laid down credible data systems, clarified rules and social safeguards, and built micro-, small-, and medium-sized enterprise demand, Finnish firms may face lower entry barriers and clearer buyer mandates in Forests, Ecosystems and Biodiversity tenders. For Finnish companies, the practical approach is to anchor offers in these enabling-environment gains (for example, interoperability with NAFORMA in Tanzania and Vietnam monitoring, reporting and verification), pair with Team Europe/GEF/Green Climate Fund finance where relevant, and highlight lifecycle compliance and rights-based delivery.

Finding 16. Digital forest information and compliance technology is in clear demand across East Africa, Southeast Asia and parts of Latin America and the Caribbean. Competition is increasing but niche sectors/solutions exist for Finnish strengths.

The most promising sectors for Finnish private sector engagement in Forests, Ecosystems and Biodiversity markets, based on the market analyses (Tanzania, Vietnam; Annex 6 and 7), like-minded peer country studies (particularly on Global Gateway) and evidence analysed for EQ1, are those that align with Finland's established expertise in digitalisation, forest management and rights-based governance. These include remote sensing and forest management information systems such as national forest inventories; measurement, reporting and verification tools that enable compliance with deforestation-free supply chain requirements; biodiversity monitoring

solutions; forest-water nexus analytics; and protected-area asset management. These sectors are particularly relevant because they respond directly to international policy drivers such as the European Union's Deforestation Regulation (European Commission and UNEP-WCMC, 2025), climate finance requirements for verifiable impact, and the growing global demand for transparent and inclusive governance of natural resources. Finnish companies have a competitive edge here due to decades of experience in developing interoperable, open-standards forest information systems and they can be expected to have experience in combining technical tools with participatory, human-rights–based approaches to resource governance.

The markets that appear especially promising[16] are Tanzania, Kenya, and Uganda in East Africa; Vietnam, Laos, and Indonesia in Southeast Asia; and Brazil, Peru, and Ecuador in Latin America and Côte d'Ivoire in West Africa. Each of these markets presents specific drivers of demand. In East Africa, forest degradation and land-use pressures are acute, and governments are investing in digital forest monitoring to improve governance and meet international reporting obligations. Tanzania, for example, has expressed strong interest in upgrading its national forest inventory and in integrating forest-water data systems to better support climate adaptation and water security. In Southeast Asia, Vietnam and Laos are already participating in programmes under the European Union's Forest Law Enforcement, Governance and Trade initiative, which creates demand for monitoring, reporting and verification systems that can ensure legality and compliance in timber and agricultural supply chains. Indonesia, with its vast forest resources and palm oil sector, has a pressing need for scalable traceability solutions. In Latin America, Brazil, Peru and Ecuador are central to Amazon Basin conservation efforts, where Global Gateway's 'Amazonia+' Team Europe Initiative is channelling significant investment into monitoring, governance, and biodiversity restoration. Meanwhile, Côte d'Ivoire is under pressure to reform its cocoa sector to meet the EU Deforestation Regulation requirements, creating a market for traceability, farmer-level monitoring, and sustainability analytics.

The demand signals across these markets are strong and multifaceted. Consultations with stakeholders in Tanzania and Vietnam highlighted a concrete interest in digital forest resource data and practical field tools, which governments see as essential for modernising forest governance and attracting climate finance. In Côte d'Ivoire, donors and government alike are seeking digital monitoring, reporting and verification and traceability systems to underpin sustainable cocoa strategies. In the Amazon Basin, both public authorities and multilateral financiers are prioritising investment in monitoring and compliance as part of large-scale landscape and biodiversity programmes. At the same time, European and global buyers are increasingly insisting on verified, deforestation-free supply chains, which is rapidly expanding the market for monitoring, reporting and verification and traceability solutions. While competition from large European consultancies and global satellite data providers is strong, Finnish firms remain competitive by offering open and interoperable systems, long-term lifecycle support, and approaches that explicitly integrate human rights, gender equality and community participation. These features make Finnish solutions attractive to governments, donors, and civil society stakeholders who seek sustainability, inclusivity and local ownership alongside technological sophistication.

16 For identifying the most promising markets, evidence from market analyses and like-minded peer country studies was enriched by AI-assisted online research, where Finnish private sector strengths (digitalisation, forest management and rights-based governance) and the related strong industrial sectors (remote sensing and forest information systems such as national forest inventories; measurement, reporting and verification tools that enable compliance with deforestation-free supply chain requirements; biodiversity monitoring solutions; forest-water nexus analytics; and protected-area asset management), which were established on the basis of the evidence mentioned in the first paragraph of Finding 16 discussion, were provided to ChatGPT-5 with a request to identify potential developing country markets. The results were triangulated by Forest Law Enforcement, Governance and Trade, Global Gateway and other EU sites' sources as well as by the Tanzania and Vietnam country consultations for this evaluation.

Finding 17. Community-based forestry and ecosystem management services show stable demand where donors are active in the sector and Finland's legacy could give its companies a competitive advantage despite this being a crowded field.

Community-based forestry, landscape management, and ecosystem restoration represent some of the most consistently effective and sustainable result areas in the Forests, Ecosystems and Biodiversity sector. These approaches are promising for Finnish private sector engagement because they connect directly to Finland's long history of forestry cooperation, participatory governance, and the integration of social and environmental sustainability into resource management. Finnish companies are well positioned to contribute solutions that combine technical innovations – such as digital monitoring platforms, sustainable forest management tools, and restoration analytics – with participatory approaches that ensure the involvement of communities, indigenous peoples, and CSOs. This combination of technology and inclusivity aligns strongly with donor expectations and government priorities in developing country contexts, creating both credibility and demand for Finnish actors.

The markets where community-based forestry and restoration services are most relevant[17] include East Africa, Southeast Asia, and selected countries in Latin America. In East Africa, countries such as Tanzania, Kenya, and Uganda are investing in community forestry models to address deforestation, improve land tenure security, and enhance livelihoods through sustainable use of forest resources. In Southeast Asia, Vietnam and Laos are advancing national forestry strategies that integrate community-based approaches with national forest monitoring systems, while donor-backed initiatives encourage inclusive landscape management. In Latin America, Peru and Ecuador are central to Amazon Basin conservation efforts, where indigenous peoples and local communities are recognised as key stakeholders in restoration and biodiversity protection. Finnish private sector actors can build on Finland's reputation in rights-based governance to co-create solutions that strengthen local ownership while delivering verifiable environmental outcomes.

Demand signals are clear across these regions. Donors and governments emphasise the need for participatory monitoring, livelihood diversification, and restoration programmes that can deliver both social and environmental benefits. Funding flows from Team Europe Initiatives and Global Gateway programmes and climate funds are increasingly directed toward inclusive and community-driven forestry projects. The competition in this space is moderate to high, with international non-governmental organisations and regional consultancies dominating many programmes. However, Finnish companies can differentiate themselves by offering technology-enabled solutions that explicitly integrate inclusivity, gender equality, and human rights safeguards.

Finding 18. Traceability and compliance requirements, especially those linked to the European Union Deforestation Regulation, are rapidly creating new market opportunities in forest-commodity supply chains across West Africa and Latin America and the Caribbean.

These opportunities are particularly promising for the Finnish private sector because they demand the type of geospatial, digital, and monitoring solutions in which Finnish companies have built strong expertise. Tools that enable accurate measurement, reporting, and verification of land use, as well as digital traceability platforms that link producers with international buyers, are increasingly essential for exporters of cocoa, soy, coffee, and timber to maintain access to European Union markets.

17 For identifying the most relevant markets, evidence from market analyses and like-minded peer country studies was enriched by AI-assisted online research along the lines described in footnote 15.

Côte d'Ivoire offers one of the most visible demand signals.[18] As the world's largest cocoa exporter, the country is under pressure to comply with the EU Deforestation Regulation by demonstrating that cocoa supply chains are free from deforestation. This requires farm-level geospatial mapping, digital traceability systems, and legality assurance mechanisms. Similarly, in Brazil, Peru, and Ecuador, the Amazonia+ Team Europe Initiative is directing significant financing into governance and biodiversity protection, including systems that can track compliance in the soy, beef, and timber sectors. Public buyers, donor programmes, and private-sector exporters in these regions are actively seeking transparent, standards-driven solutions that can link field-level monitoring with international reporting frameworks.

While competition is strong and large agri-traceability platforms, global satellite imagery providers, and multinational consultancies already supplying compliance solutions, Finnish companies can differentiate themselves by offering vendor-neutral and open-standard systems, ensuring long-term interoperability across supply chains. Moreover, Finland's emphasis on human rights due diligence, environmental, social, and governance safeguards, and lifecycle support adds credibility for buyers and donors who prioritise inclusive and sustainable approaches. This can create a market niche where Finnish providers can compete effectively while contributing to both commercial and development outcomes.

Finding 19. Blended finance and concessional financing mechanisms are significantly expanding the investable space in Forests, Ecosystems and Biodiversity markets, creating strong opportunities for Finnish private sector actors to participate in public procurement and international development programmes.

These mechanisms combine public, donor, and private capital to reduce investment risk, particularly in complex sectors such as nature data services, ecosystem restoration, water–forest resilience, and sustainable value chains. For Finnish companies, these opportunities are especially attractive because they lower the barriers to entry in markets where buyers are predominantly governments or international financing institutions and where procurement decisions increasingly require both technical excellence and demonstrable development impact.

A central instrument in this landscape is the EFSD+, which is a core part of the EU's Global Gateway strategy. EFSD+ provides guarantees and blended-finance structures that de-risk investments for private and public sector actors. This risk-sharing arrangement creates stronger appetites for innovative solutions that can contribute to climate change mitigation, biodiversity protection, and sustainable value chain development. Finnish providers of forest monitoring, restoration analytics, or traceability systems can benefit from EFSD+-backed tenders, as their solutions become more bankable when risks are underwritten by European Union guarantees. (European Commission, n.d.)

At the national level, Finland's Public Sector Investment Facility (PIF) plays a vital role in financing public-sector purchases of Finnish solutions. PIF provides concessional loans to developing country governments to procure goods and services from Finnish companies, with a focus on sustainable development outcomes (MFA, n.d.). This instrument is particularly well suited to forestry and ecosystem projects where ministries or public agencies require long-term digital tools, forest management systems, or compliance platforms, but lack the upfront resources to pay for them without concessional finance.

18 See https://international-partnerships.ec.europa.eu/countries/cote-divoire_en for more detailed information.

Finnfund further expands opportunities by investing directly in private-sector ventures in developing countries. With its focus on sustainable forestry, renewable energy, and environmental and natural resources management, Finnfund deploys both its own capital and EFSD+ guarantees through initiatives such as Africa Connected. (Finnfund, n.d.). This creates downstream opportunities for Finnish technology providers and service companies to supply solutions to Finnfund-backed enterprises or to participate in co-financed projects. As for the past programming, while Finnfund's investees and Finland's bilateral programmes have indicated compatibility and cooperation, Finnfund's forestry investments date back a long period of time and no specific focus has been given to Finnish private sector development in them because the Finnish government ownership steering of Finnfund has only started to significantly emphasise adding Finnish value during the current parliamentary term. Companies interest in Finnpartnership's sector of Forestry, Wood and Paper has, according to Finnpartnership interviews and data, been limited.

Little evidence was found of Finnish private sector engagement in Finland's past ODA-funded Forests, Ecosystems and Biodiversity portfolio reviewed (see Table 5). Most opportunities were not actively facilitated for the private sector to utilise and virtually none of them proposed funding or financing available for the companies' participation. Yet, over the recent years, evolution of Finnish bilateral programmes' engagement of Finnish private companies has occurred, albeit incrementally, in design and planning and bigger steps may have been taken in the concrete action but resource allocation for private sector engagement remains limited.[19] Overall, while most past opportunities are missed, a few past interventions propose that opportunities for private sector engagement might remain, if actively sought after. These could well be pursued by making use of the blended finance and concessional financing mechanisms and private sector instruments.

19 Two bilateral programmes depict the evolution of Finnish bilateral programmes' engagement of private companies: the Private Forestry Programme (PFP) Phase II (2019-2024) and Forestry, Land Use and Value-chains Development in Tanzania (FORLAND) (on-going), both in Tanzania. PFP II is rather similar to other past bilateral programmes in its approach to private sector development and FORLAND is currently the only existing Forests, Ecosystems and Biodiversity bilateral programme. The PFP design and implementation were rather modest about the engagement of the Finnish private sector and while some linkages were created between Tanzanian and Finnish stakeholders, in the case of the Finnish private companies, these linkages were rather thin. FORLAND, also designed before the current development policy prioritisation of opportunities for the Finnish private sector, aims to put specific emphasis to the use of Finnish expertise. The initiative seeks to harness Finnish knowledge and commercial opportunities within the forestry sector. Partners for FORLAND may encompass a wide range of entities, including businesses, government agencies, universities, research institutes, universities of applied sciences, civil society organisations, and various other stakeholders (FORLAND Project Document, MFA, 2024). Yet, while several planned FORLAND outputs indicate potential for Finnish institutions, Finnish private sector companies are indicated in a lesser number of outputs, in a narrower technical context and often rather broadly along the lines "Finnish enterprises are well-equipped to provide solutions for various stages of value-chains, with a particular emphasis on technologies, equipment, and expertise" (MFA, 2024). The Project Document is silent on describing the measures that would be needed to identify and engage the private companies from Finland. Yet, the Embassy of Finland in Dar es Salaam has opted an active role in working towards offering Finnish companies with opportunities in the context of FORLAND. In addition, PFP commissioned some analytical work on potential private sector engagement opportunities though. While perhaps targeting mostly Tanzanian companies and recommending also quite a lot of public sector participation, Finnish consultancy company Leapfrog's paper "Afrifurniture - Transitioning toward a more sustainable and resilient furniture market in Tanzania" (2021) offers an interesting example of PFP's identification of private sector engagement opportunities. However, while some attempts were made to build on the paper's recommendations, the process did not yield tangible results and stopped rather short. https://www.privateforestry.or.tz/uploads/AfriFurniture_2021_Leapfrog_Projects_Final_20210526_(Pages_1-176).pdf

Table 5 Finnish private sector engagement opportunities in Forests, Ecosystems and Biodiversity-portfolio

NAME	INSTRUMENTS (CATEGORIES FROM TERMS OF REFERENCE)	GEOGRAPHY	FINNISH PRIVATE SECTOR OPPORTUNITIES			
			ACTIVE OR PASSIVE	EXISTS OR MISSED	NEW BUSINESS OR OTHER	WITH FUNDING OR NOT
Forestry and Value chains Development (FORVAC)	Bilateral support	Tanzania	PASSIVE	LIKELY MISSED	NEW BUSINESS, IF ANY	NO FUNDING
Private Forestry Programme (PFP) and Participatory Plantation Forestry Programme (PFP II)	Bilateral support	Tanzania	PARTIALLY ACTIVE	LIKELY MISSED	NEW BUSINESS, IF ANY	NO FUNDING
Tree Outgrowers Support Programme in Tanzania (TOSP)	Bilateral support	Tanzania	PARTIALLY ACTIVE	PARTIAL-LY EXIST(ED)	NEW BUSINESS	SOME FUNDING TO SUPPORT PURCHASES
National Forest Resources Monitoring and Assessment (NAFORMA) at regional and local levels in Tanzania (INFORES)	ICI project	Tanzania	PASSIVE	LIKELY MISSED	NEW BUSINESS, IF ANY	NO FUNDING
Integrated land use Assessment (ILUA) II-phase	Multilateral support	Zambia	PASSIVE	LIKELY MISSED	NEW BUSINESS, IF ANY	NO FUNDING
Civil Society Environment Fund phase II (CSEF II)	Bilateral support	Zambia	PASSIVE (IF ANY)	MISSED	-	NO FUNDING
Decentralised Forest and other Natural Resources Programme (DFONRMP)	Bilateral support	Zambia	PASSIVE (IF ANY)	MISSED	-	NO FUNDING
VN/Management Information System for Forestry Sector Phase II (FORMIS II)	Bilateral support	Vietnam	PASSIVE	LIKELY MISSED	NEW BUSINESS, IF ANY	NO FUNDING
Informed forestry decisions, sustainable forest management and forest certification in smallholder forests in Vietnam (PFG)	CSO support	Vietnam	PASSIVE	LIKELY MISSED	NEW BUSINESS, IF ANY	NO FUNDING
Forest Policy and Economics Education and Research project (FOPER)	Regional project	Western Balkans	PASSIVE (IF ANY)	MISSED	-	NO FUNDING

NAME	INSTRUMENTS (CATEGORIES FROM TERMS OF REFERENCE)	GEOGRAPHY	FINNISH PRIVATE SECTOR OPPORTUNITIES			
			ACTIVE OR PASSIVE	EXISTS OR MISSED	NEW BUSINESS OR OTHER	WITH FUNDING OR NOT
Scaling-up Participatory Sustainable Forest Management Project (SUFORD-SU) and Forest Management and Conservation Project	Multilateral support	Lao PDR	PASSIVE (IF ANY)	MISSED	-	NO FUNDING
Regional Biodiversity Programme for the Amazon Region of Andean Countries (BioCAN)	Bilateral support	Amazon, Regional	PASSIVE (IF ANY)	MISSED	-	NO FUNDING
Livelihood Improvement through Generation and Ownership of Forest Information by Local People in Products and Services Markets project in the Mekong basin (FORINFO)	Regional cooperation	Mekong, Regional	PASSIVE (IF ANY)	MISSED	-	NO FUNDING
Sustainable Forest Management Programme in the Andean region (MFS)	Regional cooperation	Andes, Regional	PASSIVE (IF ANY)	MISSED	-	NO FUNDING
Integrated Environmental and Forest Management Co-operation Project in Central America (FINNFOR II)	Regional cooperation	C. America, Regional	PASSIVE (IF ANY)	MISSED	-	NO FUNDING
Zambia ProMs Partnership (ZAPROPA)	Finn-partnership	Zambia	ACTIVE	EXISTS	NEW BUSINESS	HAD FUNDING
Support to Implementation of the Forest Policy and Strategy in Kosovo	Multilateral support	Kosovo	PASSIVE (IF ANY)	MISSED	-	NO FUNDING
Strengthening Forest Management in a Changing Climate	Multilateral support	Unspecified	PASSIVE (IF ANY)	MISSED	-	NO FUNDING
Enhancing accuracy, accessibility and transparency of global forest resources data	Multilateral support	Unspecified	PASSIVE	VAGUELY EXISTS	POSSIBLY BOTH	NO FUNDING
World Wildlife Fund (WWF) Finland multiyear development programmes	CSO support	Unspecified	ACTIVE	EXISTS	OTHER	NO EVIDENCE OF FUNDING
Siemenpuu multiyear development programmes	CSO support	Unspecified	ACTIVE	EXISTS	OTHER	NO EVIDENCE OF FUNDING

NAME	INSTRUMENTS (CATEGORIES FROM TERMS OF REFERENCE)	GEOGRAPHY	FINNISH PRIVATE SECTOR OPPORTUNITIES			
			ACTIVE OR PASSIVE	EXISTS OR MISSED	NEW BUSINESS OR OTHER	WITH FUNDING OR NOT
IUCN-Finland Framework agreement	Multilateral support	Unspecified	ACTIVE	EXISTS	OTHER	NO EVIDENCE OF FUNDING
UN Environment Programme-Biodiversity Fund ('Living in Harmony with Nature')	Multilateral support	Unspecified	PASSIVE	EXISTS	BOTH	NO FUNDING
Miti Mingi Maisha Bora – Support to Forestry Sector Reform	Bilateral support	Kenya	ACTIVE[20]	MISSED	-	NO FUNDING
Forest and Farm Facility	Multilateral support	Unspecified	PASSIVE	EXISTS	OTHER (IF ANY)	NO FUNDING
Forestry, Land Use and Value chains Development in Tanzania (FORLAND)	Bilateral support	Tanzania	ACTIVE	EXISTS	NEW BUSINESS	NO EVIDENCE OF FUNDING
National Forest and Beekeeping Programme (NFBKP)	Bilateral support	Tanzania	PASSIVE	LIKELY MISSED	-	NO FUNDING

Notes. (i) **Private sector =** companies, firms, i.e. excludes other entities. Hence private sector development here means engaging for-profit companies and not other stakeholders that might have interest in the intervention and its spin-offs. (ii) **Active or passive? Active =** Intervention implementing partner actively working to identify and engage private sector companies. **Passive =** 1. Intervention could accommodate collaboration with private sector companies but implementing partner is not actively working to identify and engage companies and/or there is no private sector development strategy or any activities planned for private sector development; or 2. Intervention is silent about any private sector development but nevertheless operates in a sector that attracts private sector companies and could, with active facilitation and incentives, also attract Finnish companies. (iii) **Exist or missed? Exist =** Opportunities for private sector development may still exist because the intervention is underway or (with high likelihood) entering into new phase, or there is evidence of relations, reputation or other, and demand, remaining that could support private sector development if a plan and resources were committed to take action. **Missed =** No evidence of opportunities for private sector development resulting from the (past) intervention remain in the specific sector and location. (iv) **New business or other? New business =** Potential opportunities for expanding business into the sector in question and/or related sectors, i.e. opportunities that if acted upon, would have a direct impact in the company's turnover. **Other =** Potential opportunities other than expanding business and these can be in a form of collaboration for or accessing new technologies, partnerships, knowledge, skills, standards or others, i.e. opportunities that would not have a direct impact in the company's turnover. (v) **With funding or not? With funding =** the intervention has funding/financing available for private sector companies. **No funding =** no such funding/financing is available.

Source: Evaluation team

20 While not planned at the design of the intervention per se, the project management made some, not-budgeted for, active attempts to engage Finnish companies.

Finding 20. Multilateral organisations, supported by Finland among other donors, lower private-sector risk in Forests, Ecosystems and Biodiversity markets by strengthening the Forests, Ecosystems and Biodiversity-specific enabling environment.

Across Forests, Ecosystems and Biodiversity markets, multilateral organisations, in particular GEF and UNEP, operate as upstream risk mitigators. They finance and support reforms that make projects investable and procurable: (i) national forest monitoring and measurement, reporting and verification systems that reduce data and performance risk; (ii) policy, legal and regulatory updates (for example, on REDD+ and protected-area management) that reduce policy and compliance risk; (iii) safeguards, grievance redress and benefit-sharing arrangements that address social license and implementation risk; and (iv) enterprise-facing green-economy programmes that improve standards uptake and create demand for Forests, Ecosystems and Biodiversity solutions among micro, small and medium-sized enterprises. These functions, often financed through GEF grants and delivered via UNEP/UNDP/FAO consortia, translate directly into lower risk for private suppliers of forest information systems, traceability/monitoring, reporting and verification, restoration, and ecosystem-services solutions (UNEP, n.d.; GEF, 2025)

For example, in Tanzania, UN-REDD (a joint programme of UNEP, FAO and UNDP) financed the readiness architecture – a national REDD+ strategy, monitoring, reporting and verification design and capacity, and the foundational National Forest Resources Monitoring and Assessment (NAFORMA) – which is repeatedly referenced as the national forest-data baseline. This work reduces information risk for public buyers and lenders and underpins tenders for forest management information system/monitoring, reporting and verification and compliance tools relevant to Finnish companies' capabilities (UNEP, FAO and UNDP, 2013, n.d.; Tomppo et al., 2011). UNEP has also channelled GEF and Green Climate Fund finance to ecosystem-based adaptation projects that pair on-the-ground measures with institutional strengthening – closing institutional gaps and improving rules and procedures that govern land-use, a prerequisite for scalable private investment in Forests, Ecosystems and Biodiversity services (UNEP, 2025, n.d.). Regionally, SWITCH Africa Green (implemented by UNEP with EU funding) supports micro-, small-, and medium-sized enterprises and sector regulators to adopt sustainable consumption and production practices in priority sectors (agriculture, manufacturing, tourism, integrated waste management; UNEP and EU, n.d.). These both create compliant demand for green inputs/services and reduces counterpart risk for vendors entering these markets. Complementing this, recent GEF work programmes in Africa continue to finance integrated landscape governance and conservation projects that improve protected-area operations and financial management – key governance preconditions for performance-based contracts and public-private partnerships in restoration/ecosystem services (GEF, n.d.).

In another example, Vietnam's multi-year UN-REDD engagement (with UNEP as co-implementer) established monitoring, reporting and verification methods, safeguards and benefit-sharing mechanisms later incorporated into World Bank Forest Carbon Partnership Facility operations. This reduces policy and social risk, clarifies revenue flows and grievance redress, and increases predictability for suppliers of monitoring, reporting and verification, forest management information system and community-monitoring tools. (UN-REDD, 2010, 20112; Ministry of Agriculture and Rural Development, 2019; World Bank 2021; REDD+ Vietnam, n.d.). In parallel, GEF-financed projects, implemented with UN agencies, have supported sustainable forest and forest-land management and the mainstreaming of biodiversity and natural-resource objectives into provincial planning. These shifts make it easier for line ministries to specify, procure and finance digital forest information, restoration analytics and biodiversity monitoring solutions aligned with global reporting duties (for example, Nationally Determined Contributions and the Kunming–Montreal Global Biodiversity Framework). (GEF, 2020; UNDP, n.d.).

4.5 Foreseen gains and benefits for Finnish companies and development cooperation

Summary answer to EQ 2.2 – Potential gains for Finnish companies and development cooperation

Finnish companies are likely to make commercial gains by anchoring offers in forest management information systems and traceability and leveraging Public Sector Investment Facility/European Fund for Sustainable Development Plus financing, and their capability gains are likely to arise from deeper positioning in Team Europe and scalable Nordic consortia. Potential development outcomes from deepening the engagement of the private sector include stronger governance, which can lead to benefits to local communities and climate and biodiversity impact. Finnfund's investments in forestry already show measurable climate and livelihood impacts, and their human rights-based approach and environmental, social, and governance practices increase the development additionality. Systemic value would emerge when Finland's various private sector instruments are used in a complementary manner to reduce barriers to market entry, support procurement, and scale promising solutions. For Finnish companies operating in Forests, Ecosystems and Biodiversity markets, this integrated approach could create a financing and support ecosystem that strengthens both commercial viability and development impact.

Finding 21. Finnish companies are likely to make commercial gains by anchoring offers in forest management information systems and traceability and leveraging Public Sector Investment Facility/European Fund for Sustainable Development Plus financing.

Commercial gains for the Finnish private sector in Forests, Ecosystems and Biodiversity markets are most likely to arise when companies align their offers with both regulatory drivers and financing mechanisms. Anchoring solutions in forest management information systems, measurement, reporting and verification tools, and traceability systems that enable compliance with the European Union Deforestation Regulation creates immediate market relevance. When these technical offers are combined with participatory, rights-based delivery models – consistent with Finland's human rights-based approach – they not only satisfy donor requirements but also achieve higher evaluation scores in competitive procurements. This combination directly improves Finnish companies' chances of winning contracts and gaining market share.

The commercial gains themselves are multi-faceted. By winning tenders in Global Gateway or Team Europe Initiative pipelines, Finnish companies gain access to high-value, multi-year contracts financed by international financing institutions such as the European Investment Bank. These contracts often include provisions for operation and maintenance services, which generate predictable, long-term revenue streams. In addition, the credibility gained from securing such contracts enhances a company's profile and improves its ability to bid successfully for future opportunities in other markets. Leveraging Finland's PIF also unlocks public-sector transactions by allowing developing country governments to procure Finnish technology on concessional terms. Similarly, the EFSD+ de-risks private co-investment, making it easier for Finnish firms to enter partnerships or joint ventures in markets where commercial risks are high.

The advantages of pursuing these opportunities are clear. Finnish firms benefit from alignment with regulatory demand (EU Deforestation Regulation), access to risk-sharing financing (EFSD+),

and a supportive national instrument in PIF. Together, these elements reduce barriers to entry, mitigate financial risk, and ensure that Finnish offers are seen as both technically strong and socially responsible. They also enable companies to position themselves within flagship international programmes, enhancing visibility and long-term competitiveness.

However, there are also challenges and trade-offs. The procurement processes associated with Global Gateway and other large-scale donor programmes are often complex, time-consuming, and resource-intensive, which can be difficult for smaller firms to navigate. Furthermore, while EFSD+ reduces risk, it does not eliminate the need for companies to commit their own capital, and in high-risk environments, the potential for project delays or policy changes remains significant. Finally, competition from larger European and global firms is intense, meaning Finnish companies must differentiate themselves clearly through advanced technical systems and innovation, and participatory approaches, as already outlined in Finding 18.

Finding 22. Finnish companies' capability gains are likely to arise from deeper positioning in Team Europe and scalable Nordic consortia.

Capability gains for the Finnish private sector in Forests, Ecosystems and Biodiversity markets are closely linked to participation in Team Europe Initiatives and Global Gateway projects.[21] These platforms are designed to mobilise large-scale, multi-donor investments in sustainable infrastructure, ecosystems, and governance. For Finnish companies, engaging in these initiatives offers opportunities not only to secure contracts but also to build organisational capabilities, strengthen international networks, and enhance credibility in global markets.

One of the most immediate capability gains comes from embedding Finnish small and medium-sized enterprises in high-visibility projects financed by the European Investment Bank, the EFSD+, and other international financing institutions. Such projects require high technical standards, rigorous monitoring and evaluation frameworks, and compliance with strict environmental, social, and governance safeguards. Successfully delivering within these frameworks builds a track record that is highly valued by future clients and funders. Finnish firms that demonstrate capacity in interoperability, transparency, and inclusive approaches can leverage these experiences as references when expanding into new regions or bidding for larger contracts.

A second important capability gain arises from the potential for Nordic collaboration. By forming consortia with Swedish and Danish partners, Finnish companies can combine complementary strengths – such as Finland's expertise in forest management information systems and measurement, reporting and verification, Sweden's leadership in advanced forest modelling and land-use analytics, and Denmark's strengths in water management and environmental engineering. Working together in Team Europe Initiative-aligned projects allows Nordic firms to bid for larger, more complex contracts than they could pursue individually. This foster learning across borders, strengthens consortium management skills, and positions Finnish companies as reliable partners in international consortia.

Participation in Team Europe also deepens companies' ability to operate in diverse institutional and political contexts. For instance, working alongside European Union delegations, national governments, and CSOs exposes Finnish firms to varied governance structures and stakeholder

21 See private sector engagement intensive study on Global Gateway and private sector engagement like-minded peer study on Global Gateway in environment and natural resource management in Sweden and Denmark, annexed to the synthesis report.

dynamics. This experience enhances cultural competence, negotiation skills, and the ability to integrate human rights-based approaches into technical solutions – capabilities that are increasingly necessary in international development markets.

The primary challenge lies in the complexity and resource intensity of engaging in these initiatives. Smaller Finnish firms may find the administrative requirements of Team Europe Initiative procurement burdensome, and the need to adapt to consortium decision-making can dilute control over project design. Nevertheless, towards these ends, the Team Finland partners, notably Finnpartnership, can offer support and should enhance the offering as the long-term capability gains for the Finnish small-, and medium-sized enterprises – in terms of enhanced credibility, strengthened partnerships, and improved technical and managerial competencies – far outweigh the drawbacks.

Finding 23. Potential development outcomes of Finnish private sector engagement include stronger governance, which can lead to benefits to local communities and climate/ biodiversity impact, as already demonstrated by Finnfund's results.

By engaging in the Forests, Ecosystems and Biodiversity markets, Finnish companies can generate outcomes that strengthen governance, improve local livelihoods, and contribute to global climate and biodiversity goals. These contributions not only enhance Finland's international reputation but also provide legitimacy for private sector engagement as a development tool.

One of the clearest development outcomes is improved governance of natural resources. When Finnish companies deliver forest management information systems, measurement, reporting and verification tools, or traceability platforms, they strengthen the capacity of partner governments to monitor land use, enforce regulations, and comply with international agreements such as the EU Deforestation Regulation. Research shows that better governance reduces illegal logging, improves transparency, and creates a more predictable environment for sustainable investment. For local communities, this can translate into greater security of tenure, stronger participation in decision-making, and more equitable access to natural resources.

Another key outcome is enhanced livelihoods for rural communities. Community-based forestry and restoration projects, when supported by technology-enabled monitoring and inclusive governance, provide opportunities for smallholders and indigenous peoples to benefit from sustainable value chains. For example, digital traceability systems in Côte d'Ivoire's cocoa sector not only help exporters maintain access to European markets but also enable farmers to demonstrate compliance and access premium buyers.[22] If Finnish companies integrate human rights-based approach and gender-sensitive programming into their solutions, they can contribute to tangible social outcomes such as improved income, better working conditions, and stronger representation of women and youth in natural resource governance.

Finnfund's portfolio[23] provides practical evidence of development outcomes linked to private sector investment. Its forestry and environment investments have generated measurable climate mitigation benefits through carbon sequestration and improved biodiversity management, while also creating jobs and income opportunities in partner countries. Finnish firms could be yet more targeted to supply technology and services to such projects and thus add value by ensuring robust

22 See https://international-partnerships.ec.europa.eu/countries/cote-divoire_en for more detailed information.

23 See private sector engagement intensive study on Finnfund, annexed to the synthesis report.

data, monitoring, and reporting systems that make climate and biodiversity impacts verifiable. This credibility is critical for accessing climate finance and sustaining long-term donor support.

Challenges remain, particularly in ensuring that development outcomes are both inclusive and sustained beyond project cycles. There is a risk that technology-driven interventions may exclude marginalised groups if not combined with participatory approaches. However, by embedding human rights-based approach principles, environmental, social, and governance safeguards, and long-term capacity building into their solutions, Finnish companies can ensure that commercial success translates into lasting development benefits.

Finding 24. Systemic value emerges when Finland's various private sector instruments are used in a complementary manner to reduce barriers to market entry, support procurement, and scale promising solutions, while some tweaking of the instruments might be beneficial.

Finnpartnership plays a crucial role at the early stage of the innovation cycle. Through its business partnership support and innovation funding schemes, it provides grants that de-risk feasibility studies, pilot projects, and co-creation with local partners. For small-, and medium-sized enterprises, this support is often the only way to test solutions in challenging developing country contexts where costs are high and returns uncertain. By funding market entry and initial partnerships, Finnpartnership lays the foundation for subsequent commercial expansion. Yet, it has to be noted that according to in particular CSO interviewees but also some private sector survey-respondents, the current Finnpartnership rules make it challenging for companies in the agriculture sector to engage in projects due to its application of de minimis regulation which limits funding available to primary production of agricultural products. Other aspects of the funding modality make the Finnpartnership instrument challenging for company and CSO partnerships, while in contrast, the Denmark's Danida Green Business Partnership reviewed in the context of this evaluation, uses the General Block Exemption Regulation to engage a wider range of sectors and makes funding available to CSO actors in the private-public consortium as advance payments.

PIF, nevertheless, complements these early-stage activities by enabling developing country governments to procure Finnish solutions on concessional terms. Many of the most promising opportunities in the Forests, Ecosystems and Biodiversity sector involve public buyers, such as forestry agencies or ministries of environment, that lack sufficient resources for full-cost procurement. By financing public-sector acquisitions of digital forest monitoring systems, biodiversity analytics, or restoration services, PIF can translate pilot successes into larger contracts.

Finnfund adds a third layer of systemic value by providing catalytic investment capital. As Finland's development finance institution, Finnfund invests in private enterprises that deliver measurable environmental and social benefits, with a particular focus within the Environment and Natural Resources management on sustainable forestry and renewable energy. For Finnish firms, Finnfund's investments in forestry plantations, restoration projects, or sustainable value chains can create downstream opportunities to supply technology, services, and expertise. By leveraging EFSD+ guarantees through initiatives such as Africa Connected, Finnfund reduces investment risk, broadening the scope for Finnish participation.

Finally, Global Gateway and Team Europe Initiatives provide the regional and multilateral platforms that scale these interventions. When Finnish companies demonstrate proven models through Finnpartnership and PIF, and when these are underpinned by Finnfund investments, they are well positioned to join larger EU-backed programmes. This would create visibility for Finnish expertise, ensure interoperability with other European solutions, and support long-term market positioning.

4.6 The best approaches and measures to private sector engagement

Summary answer to EQ 2.3 – Most promising approaches for promoting Finnish private sector engagement

Promising approaches to private sector engagement in Forests, Ecosystems and Biodiversity markets include (i) a 'forest management information systems–to–Compliance Ladder', (ii) creation of Nordic consortia focused on 'Nature-Data and Water–Forest Nexus' solutions, and (iii) systematic development of local operation and maintenance ecosystems. The 'forest management information systems–to–Compliance Ladder' approach would position Finnish companies to deliver end-to-end digital solutions that start with basic forest inventories and scale up to advanced compliance and traceability systems. The Nordic 'Nature-Data and Water–Forest Nexus' approach would allow Finnish firms to expand their commercial reach and build institutional capacity for partnership management, knowledge sharing, and innovation. Building local operation and maintenance ecosystems would not only secure the durability of Finnish solutions but also create shared value through local job creation, institutional strengthening, and sustainable development outcomes.

The approaches proposed here are based on the evaluation's evidence streams (notably market analyses, like-minded peer country studies and desk review) and online research (on competition aspects). This evidence is analysed by the team and, making use of AI,[24] formulated into the proposed plausible approaches.

Finding 25. Development of a 'forest management information systems–to–Compliance Ladder' -strategy would position Finnish companies to deliver end-to-end digital solutions that start with basic forest inventories and scale up to advanced compliance and traceability systems.

By structuring engagement as a phased ladder from basic forest inventories to compliance and traceability systems, Finnish firms can support governments in meeting both domestic resource management needs and international regulatory obligations, while simultaneously building long-term commercial relationships. As evidenced in the market analyses of forest management information system in Tanzania (see Annex 6) and Vietnam (see Annex 7), this approach could be implemented in those two countries but is applicable also in other markets.

The first phase involves co-creation and piloting. Through Finnpartnership's business partnership support and innovation funding, Finnish companies can work with forestry agencies, ministries of environment, and local research institutions to test forest inventory tools, data collection systems, and remote-sensing platforms. These pilots are critical in demonstrating technical viability and building trust with local stakeholders. By embedding human rights-based approach and community consultation and gender-sensitive training, Finnish firms can ensure their solutions are inclusive and accepted at the local level.

24 Here, evaluation team's evidence and analysis in the market analyses, like-minded peer country studies and desk review as well as from this report's chapter 4.4. was processed with ChatGPT-5 to generate proposed approaches. Out of several generated, the evaluation team picked three and developed them further.

The second phase leverages the PIF to scale these pilots into full procurements. PIF's concessional financing can allow governments to acquire forest management information systems platforms, monitoring systems, and associated services despite. This mechanism is particularly relevant in East Africa and Southeast Asia, where public forestry agencies recognise the importance of digital systems but lack adequate financial resources. For Finnish companies, PIF-financed contracts create stable revenue streams and establish long-term relationships with public institutions.

The third phase links national-level forest management information systems with international compliance requirements. As countries prepare to meet the EU Deforestation Regulation and participate in Team Europe Initiatives, they require advanced monitoring, reporting and verification systems and legality assurance mechanisms. Global Gateway's EFSD+ guarantees can de-risk large-scale rollouts, while Finnfund can provide investment capital to private operators managing forest concessions or restoration projects that rely on forest management information systems data. This can create downstream demand for Finnish companies to deliver integrated compliance solutions.

The competitive landscape includes global satellite data providers and large European consultancies, but Finnish firms can differentiate themselves through open-standard, vendor-neutral systems and solution lifecycle support. Their ability to combine advanced digital technology with human rights-based approach and environmental, social, and governance safeguards would make them attractive to both public buyers and donors.

Finding 26. A second promising approach for Finnish private sector engagement in Forests, Ecosystems and Biodiversity markets is the creation of Nordic consortia focused on 'Nature-Data and Water–Forest Nexus' solutions.

By pooling complementary expertise across Finland, Sweden, and Denmark, Nordic companies can offer integrated solution packages that are well suited to large-scale Global Gateway and Team Europe Initiative programmes. This strategy recognises that complex challenges such as forest degradation, watershed management, and biodiversity loss require multidisciplinary responses that no single actor can provide (see private sector engagement like-minded peer country-study on Global Gateway in environment and natural resources management in Sweden and Denmark attached in the synthesis report).

The Finnish contribution to such consortia would focus on geospatial tools, forest management information systems, and monitoring, reporting and verification platforms. Sweden could contribute advanced forest modelling, land-use planning, and climate analytics, while Denmark could bring expertise in water resource management, environmental engineering, and nature-based solutions for urban resilience. Together, these capabilities create 'solution kits' that address both the ecological and socio-economic dimensions of forest–water systems.

These consortium-based solutions would be particularly relevant in countries where forest and water management are deeply interconnected, such as Egypt (through the Nexus of Water, Food and Energy (NWFE) Programme), Papua New Guinea (forest–watershed resilience), and Amazon Basin countries (integrated forest–river basin management).[25] In such contexts, governments and International Financing Institutions seek holistic approaches that deliver multiple SDGs simultaneously: climate action, biodiversity conservation, and livelihood improvement. By presenting

25 See the following: European Commission (2023). Global Gateway: European Fund for Sustainable Development Plus (EFSD+). Retrieved from ec.europa.eu. European Investment Bank (2023). European Investment Bank Global: Global Gateway investment operations. European Commission (2023). Amazonia+ Team Europe Initiative.

integrated offers, Nordic consortia can meet these demands more effectively than fragmented, single-country bids.

The financing model for such consortia can draw on a blend of instruments. Finnish companies can access the PIF for government procurements and, with some caveats, Finnfund for catalytic capital in private-sector partnerships. Sweden's Swedfund and Denmark's Investment Fund for Developing Countries provide parallel instruments, and all three countries can benefit from the EFSD+ guarantees under the Global Gateway framework. This blended financing stack allows Nordic consortia to bid for larger contracts with reduced risk and greater financial sustainability.

While competition is strong from multinational engineering firms and global consultancies, Nordic consortia can differentiate themselves through open-standard, vendor-neutral systems and strong commitments to human rights due diligence, gender equality, and community inclusion. This alignment with donor expectations strengthens the credibility of Nordic bids and increases success rates.

Finding 27. A third strategic approach for Finnish private sector engagement in Forests, Ecosystems and Biodiversity markets is the systematic development of local operation and maintenance ecosystems.

The systematic development of local operation and maintenance ecosystems approach directly addresses one of the most persistent challenges in international development projects supplying modern technology: the sustainability of technology and systems once donor-funded pilots or installations conclude. By embedding strong local service structures into every deployment, Finnish companies can ensure continuity, enhance local ownership, and deliver the long-term results.

The rationale for focusing on operation and maintenance ecosystems is clear. Many digital platforms, monitoring systems, and technical tools in the forestry and biodiversity sectors have failed to remain operational after initial project funding ended because local institutions lacked the resources or technical capacity to maintain them. For Finnish companies, this represents both a risk, since project outcomes may deteriorate, and an opportunity to differentiate themselves by designing solutions with built-in longevity. Creating local ecosystems of trained technicians, micro, small, and medium-sized enterprises, and service hubs ensures that systems are continuously supported, adapted, and scaled.

In practice, Finnish firms can prototype local operation and maintenance models during the early stages of engagement through Finnpartnership's business partnership support. Training-of-trainers programmes, local helpdesks, and partnerships with vocational institutes or universities can create a pipeline of local expertise. As projects move to procurement, the PIF can require governments to include multi-year operation and maintenance service packages as part of their financed contracts. This ensures that funding is allocated not only for the initial technology but also for its upkeep and adaptation.

At the investment stage, Finnfund, again with some caveats, can play a role by financing local service providers who assume responsibility for operation and maintenance functions. For example, a local enterprise managing a digital forest monitoring system or a biodiversity data platform could access catalytic financing to scale its services while partnering with Finnish technology providers for upgrades and backstopping. The EFSD+ guarantees can reduce the risk for these local enterprises, making the model more viable.

Competition in operation and maintenance provision is often fragmented, with many projects relying on short-term consultants or ad hoc arrangements. Finnish companies can stand out by embedding robust operation and maintenance models that emphasise inclusivity, gender equality, and human rights-based approach. By ensuring that women and marginalised groups are included in training and service provision, Finnish actors also strengthen the social legitimacy of their solutions.

5 Conclusions

Conclusion 1. Environmental benefits are achievable at scale when conservation is embedded in governance systems and economic incentives. Fragmented design and premature exits limited the consistency of results, while long-term cooperation achieved impact and lasting results.

Findings: 1, 2, 7, 8, 12, 15, 18

The evaluation shows that Finland's environmental contributions went well beyond project outputs: they confirmed that when communities hold secure tenure, are supported by functioning institutions, and can derive tangible income, deforestation falls and ecosystems are restored. Environmental results were strongest where forest management was integrated into national legal frameworks and supported by compliance systems and market incentives, as well as where cooperation was long lasting. Where such enabling factors were absent, or where programmes ended before benefits could be consolidated, environmental outcomes remained partial or faded over time.

Conclusion 2. Biodiversity integration was uneven: global and civil society partners delivered tangible biodiversity benefits, while bilateral programmes prioritised forest cover and production over biodiversity outcomes.

Findings: 2, 3

Evidence showed that civil society organisations and multilateral channels (e.g. WWF, Siemenpuu, GEF, IUCN) effectively reduced illegal wildlife activity, strengthened ecosystem services, and enhanced carbon sequestration. In contrast, bilateral projects in Tanzania and Lao PDR often underplayed biodiversity monitoring and management, focusing instead on forest cover and timber production. The reliance on exotic plantation species such as eucalyptus and pine further limited biodiversity gains.

Conclusion 3. Support to forest management information systems, an example of Finnish added value, has been among the most successful and strategically justified areas of Finnish support producing sustained outputs.

Findings: 5, 9, 10, 13, 14, 16

Forest management information systems is clearly the one result area where findings are prominently positive regardless the instrument or the project. The bilateral project FORMIS has proved to be both impactful and sustainable. Similarly, FAO's global and in-country projects working on improving the approaches, methods and tools for National Forest Inventories and Forest Resource Assessments are credited for developing important and effective tools (e.g. the Open Foris). This is also a result area where Finnish public and private sector organisations have expertise and knowledge to share.

Conclusion 4. Community-based forest management emerged as Finland's most effective and replicable approach, but its success depends on secure tenure, institutional capacity, and continuity of support.

Findings: 1, 3, 4, 7, 8, 12, 13

Across Kenya, Tanzania, Zambia and Lao PDR, Finnish-supported community-based forest management programmes demonstrated that clear land-use rights, participatory planning, and functioning local institutions can simultaneously reduce deforestation, improve governance, and generate community income. These interventions validated the principle that tenure security and land-use planning are non-negotiable foundations for sustainable forest management. Bilateral projects in the 2010s were instrumental in proving the model, while CSO and multilateral partners have since extended it by integrating biodiversity conservation, indigenous rights and poverty reduction.

The effectiveness of community-based forest management, however, was undermined whenever funding cycles ended prematurely, leaving institutions without the resources to enforce rights or sustain benefit-sharing. This interrupted the chain from institutional capacity to national policy influence and community-level outcomes. By contrast, where continuity was preserved, community-based forest management created durable systems recognised and scaled by other donors.

Conclusion 5. Support to value chain development is a well justified area of Finnish support. However, results have been weak, largely because private sector has not been fully involved in the process.

Findings: 7, 8, 12

Value chain development was an important component in the bilateral and regional forestry projects. The common challenge with all of them is that the projects have emphasised production and given less emphasis on processing (except PFP, PFP 2 and to a certain extent FORVAC) and have had very limited attention to market access and demand for products.

The underlying shortcoming has been that the importance of involving private sector in value chain development has been underestimated. Too often value chains have been developed by development specialists and researchers, whereas functional and sustainable value chains would require involving strong private sector stakeholders to enable reasonable access to markets and sustainable economic development of the value chains. There is a need for better understanding of business approaches and private sector expectations among development projects.

Conclusion 6. Finland's bilateral, Institutional Cooperation Instrument and civil society organisation support proved complementary, with synergies strongest where Institutional Cooperation projects paired with bilateral programmes to consolidate technical systems and capacities.

Findings: 12, 14

The pairing of bilateral programmes (e.g. FORMIS, PFP, FORVAC) with ICI or FAO projects (INFORES, NAFORMA) created robust packages of technical assistance, institutional capacity and community-level application. This modality mix ensured sustainability of information systems and fostered policy dialogue grounded in credible data. CSO partners extended reach into grassroots communities, translating technical and policy reforms into tangible inclusion and conservation

outcomes. Together, the modalities enhanced Finland's overall credibility, though the degree of complementarity depended on consistent coordination and long-term engagement.

Conclusion 7. While combining instruments enabled complementary projects, and a high-quality capacity-building focus helped secure the sustainability of results, Finland largely left policy influencing and high-level dialogue to partners, factors also critical to long-term sustainability.

Findings: 8, 9, 12, 13, 14, 15, 17, 18, 19

At the operational level, work across instruments (bilateral, ICI, and core/multilateral) was coherent and practical. However, Finland's direct role in policy influencing and high-level dialogue appears limited, a surprising gap, as it would likely have increased sustainability. Institutionalisation and budgetary follow-through often depended on partner ownership or broader donor coalitions rather than Finnish stewardship. Finland relied more on capacity building for sustainability. A strong capacity-building strand ran through nearly every intervention, deliberately aiming to enable sustainability by strengthening skills, systems, and routines. Finland relied more on capacity building as the sustainability lever, and this strong capacity building strand, embedded across interventions, did strengthen skills, systems, and routines. However, without consistent policy-level advocacy to lock in mandates, financing, and accountability, the long-term resilience of results remained uneven.

Conclusion 8. The structure of Finland's Forests, Ecosystems and Biodiversity portfolio shifted from bilateral to multilateral and civil society organisation channels, reducing Finland's direct possibilities to influence. This shift was largely driven by budgetary cuts rather than deliberate strategic choice.

Findings: 3, 4, 6, 14, 15

The composition of the Forests, Ecosystems and Biodiversity portfolio has changed drastically since 2010. In the early to mid-2010s, bilateral and regional forestry projects dominated in both number and volume, showcasing Finnish technical strengths and delivering policy reforms, institutional capacity and community-level results. Today, bilateral forestry cooperation has almost disappeared: FORLAND is the only ongoing bilateral project, while ecosystems and biodiversity interventions are channelled almost exclusively through multilaterals, intergovernmental organisations and CSOs. This shift was not a deliberate policy reorientation but an unintended effect of repeated aid cuts in 2015–2016 and after 2023.

The balance of funding across the period shows forestry and biodiversity receiving roughly equal commitments, but the channel mix has changed: bilateral and ICI projects contributed most visibly to Finland's development policy objectives in forestry, while multilateral and CSO channels advanced ecosystem and biodiversity goals at impact level (e.g. SDGs, Multilateral Environmental Agreements). Private sector engagement has been limited, with only modest activity through Finnfund and Finnpartnership. Finnish added value has primarily been delivered by public institutions, research organisations and CSOs, not private companies. Importantly, the mainstreaming of cross-cutting objectives and human rights-based approaches was most evident in bilateral and CSO projects, contributing to tangible results at community and policy level.

Conclusion 9. The effectiveness of geospatial analysis as an evaluation tool is only as strong as the quality of the underlying data, making systematic data management a critical requirement for future projects.

Finding: 11

The experience of assessing FORVAC's and PFP's impact demonstrates that the effectiveness of geospatial methods in project evaluation depends fundamentally on the quality of the underlying data. While remote sensing and spatial analysis can provide powerful, independent insights into land-use change, their credibility and utility are undermined when project datasets are incomplete, inconsistent, or not well-documented. In both cases, substantial time and effort had to be devoted to correcting basic data deficiencies before meaningful analysis could start, and even then, the official project coverage could not be fully validated. This not only limits the transparency and accountability of the reported results but also reduces the potential of geospatial analysis to support adaptive management and long-term monitoring. Addressing these systemic data management gaps is therefore essential if Finland's forestry investments are to deliver measurable and verifiable outcomes. By embedding robust geospatial data standards into project design and implementation, Finland can ensure that future interventions are not only effective on the ground but also demonstrably so in terms of evidence and accountability.

Conclusion 10. Finland's dual value proposition, advanced technical systems paired with participatory governance, can make Finnish companies competitive in the markets which demand digital forest information and compliance technology and engagement in community-based forestry.

Findings: 9, 10, 12, 13, 15, 16, 17, 18, 21, 25, 26, 27

The evidence indicates that the most dynamic demand in Forests, Ecosystems and Biodiversity markets sits at the intersection of digital forest information, measurement–reporting–verification and supply-chain compliance, alongside steady donor-backed demand for community-based forestry and restoration. Finland's distinctive combination of interoperable, open-standards forest management information systems and rights-based, participatory delivery enables offers that are both technically robust and socially legitimate, which is valued by public buyers and multilateral partners.

Moving beyond pilots, this pairing improves evaluation scores and procurement competitiveness because solutions embed human rights-based approach (human rights-based approach), gender equality and lifecycle support, while answering regulatory drivers such as the European Union Deforestation Regulation. It is therefore not only a market match but also a credibility strategy in crowded tenders.

Finally, the approach translates into development additionality: stronger governance, verifiable climate and biodiversity outcomes, and livelihood gains when communities and local civil-society organisations are explicitly integrated into system design and operation and maintenance arrangements.

Conclusion 11. For Finnish companies engaging in Team Europe and Global Gateway initiatives, the promise of commercial gains from forest management information systems, monitoring, reporting and verification, and traceability solutions, when supported by Public Sector Investment Facility and European Fund for Sustainable Development+, outweighs the challenges.

Findings: 16, 18, 19, 20, 21, 22, 25

Positioning in Team Europe Initiatives and Global Gateway exposes Finnish small-, and medium-sized enterprises to high-standards delivery (environmental, social, and governance/human rights-based approach, rigorous monitoring, evaluation and learning, interoperability), building sought-after references and consortia skills. The commercial upside is amplified where PIF (concessional public procurement) and EFSD+ (risk-sharing guarantees) are used to de-risk scale-up and crowd in finance for forest management information systems, monitoring, reporting and verification and traceability offers.

Although engagement requires administrative stamina and co-bidding, the balance of evidence suggests that the pathway – forest management information systems/traceability anchored offers + PIF/EFSD+ backed finance – produces higher win rates and multi-year operation and maintenance revenue, making it a realistic route to international scaling aligned with Finland's development policy aims.

In short, Team Europe Initiative/Global Gateway participation is not only deal flow; it is a structured capability-building ladder that compounds over subsequent procurements and geographies.

Conclusion 12. While we may not yet be fully there, the systemic value of private sector engagement lies in the ability of the existing instruments to work together as a coherent pipeline – from pilot to procurement to investment to regional scale.

Findings: 19, 20, 21, 22, 24, 26, 27

When Finland's instruments are sequenced – Finnpartnership for entry and co-creation, PIF for public procurement, Finnfund for catalytic investment, and EU Global Gateway/EFSD+ for regional scale – the result can a de-risked, end-to-end pipeline from pilot to investment. This reduces fragmentation, clarifies the route for small-, and medium-sized enterprises, and increases the likelihood that promising Forests, Ecosystems and Biodiversity solutions will be sustained and replicated.

The portfolio review shows missed or under-used private sector engagement opportunities in earlier ODA programming; a pipeline approach addresses precisely that gap by earmarking resources and instruments at each stage and by linking them to concrete tenders and Team Europe Initiatives.

This coherence also strengthens development results: procurement designs can hard-wire human rights-based approach, inclusion and multi-year operation and maintenance, while investment layers keep systems financed beyond project cycles.

Conclusion 13. Promising private sector engagement tactics in Forests, Ecosystems and Biodiversity call for integrated, step-wise, collaborative, strategic and systemic approaches.

Findings: 19, 20, 23, 24, 25, 26, 27

The 'forest management information systems-to-Compliance Ladder' gives governments a phased path from basic inventories to full compliance and traceability; Nordic 'Nature-Data and Water–Forest Nexus' consortia assemble multi-disciplinary capability at Team Europe Initiative scale; and local operation and maintenance ecosystem building ensures durability and local value capture. Together, these tactics operationalise the pipeline logic in practical bids and programmes.

They also align with demand drivers (EU Deforestation Regulation, climate and biodiversity finance) and donor preferences (interoperability, inclusion), while differentiating Finnish offers through open, vendor-neutral architectures and lifecycle services.

Overall, success hinges on sequencing (pilot–procure–invest–scale), partnering (Nordic + Team Europe) and resourcing operation and maintenance from the outset.

6 Potential Action Points

Action point 1. Continue support to Forests, Ecosystems and Biodiversity sector. Scale community-based forest management through longer horizons and delegated cooperation.

Related conclusions: 1, 2, 4, 10

Community-based forest management proved to be an effective approach to achieve sustainable impact in forestry conservation and ecosystems management. To continue the good work, Finland should prioritise delegated cooperation (as lead or co-lead), letting EU grants provide the long arc while CSO partners ensure inclusive delivery and biodiversity outcomes. This retains Finland's influence despite shrinking bilateral ODA by 'borrowing' EU implementation horizons and budgets.

Action point 2. Synergistic approaches across the Environment and Natural Resources sub-sectors should be sought to address the multiple crises of climate, biodiversity and security – and to link nature with human security.

Related conclusions: 1, 2, 3, 5, 6, 7, 8, 12, 13

Finland's strong expertise in forest management and nature restoration could be combined with its similarly strong expertise in water sector, meteorology and hydrology. Nature-based solutions at the forest–water–meteorology nexus (e.g. fire-smart mosaics, riparian/erosion control, connectivity restoration) deliver measurable co-benefits for biodiversity, climate adaptation and local security when guarded by human rights-based approach, native-species preferences and no-net-loss standards.

The evidence suggests Finland's strongest comparative advantage arises when technical nature-data systems and participatory governance travel together. A Nordic consortium model at Team Europe scale can assemble that multi-disciplinary capability for public buyers and international financing institutions, while keeping costs off Finland's ODA envelope. This also improves win-rates for Finnish small-, and medium-sized enterprises through reference-building and shared bid management.

Action point 3. Reorient value chain support towards market access and private-sector participation from the outset, grounded in a comprehensive analysis of institutional and technical bottlenecks and an explicit risk-management plan, with early buyer/off-taker commitments.

Related conclusions: 5, 10, 11, 12, 13

Forestry value chain development is needed to address the global challenges. The evaluation finds that value chain efforts under-performed where business logics and private demand were not central. Requiring early private-sector anchoring (buyers/off-takers, processors, logisticians) addresses this gap while aligning economic incentives with environmental objectives. Each activity should build a clear business case, processing capacity, market linkages and demand creation with committed firms, using CSO and multilateral platforms to de-risk inclusion and apply safeguards. This approach corrects past design weaknesses and supports poverty reduction and environmental outcomes simultaneously.

Action point 4. Sustain and increase biodiversity support.

Related conclusions: 2, 8

There is an urgent need for MFA to sustain and increase funding for the protection of biodiversity. MFA's current multilateral and CSO partners are all producing results effectively and are worthy of continued support.

Action point 5. Standardised and verifiable geospatial datasets should be applied in forestry and other environmental projects to make meaningful geospatial analysis as easy as possible in future.

Related conclusions: 9

To ensure that geospatial data quality issues do not persist in future forestry projects financed by Finland, geospatial data management should be established as a formal requirement from the outset. This includes mandating the use of standardised metadata, consistent naming conventions, and complete file structures, alongside rigorous quality assurance checks before data is finalised and reported. Implementing version control systems and ensuring alignment between project reports and spatial datasets would safeguard data integrity and traceability. Furthermore, capacity building for implementing partners in geospatial data handling and documentation should be prioritised, so that all supported projects produce reliable, verifiable, and replicable spatial datasets that can serve as a foundation for independent evaluation and long-term monitoring of environmental outcomes.

Action point 6. Look into more effective methods to incorporate private sector engagement in both bilateral and multilateral channels.

Related conclusions: 3, 6, 10, 11, 12, 13

The future of bilateral projects in the Forests, Ecosystems and Biodiversity sector should be reconsidered. If MFA would reinvest in bilateral projects and programmes (or multi-bi programmes), opportunities for incorporating Finnish private sector engagement could be purposefully built in those interventions. The decisions to close down many country programmes should be reconsidered because they are leading into the extinction of bilateral programmes.

Bilateral programmes can offer a 'platform' for private sector engagement but the programmes and activities where companies be included, must be selected carefully. Most 'purely forestry' interventions can likely accommodate and benefit from the involvement of private companies in selected activities but in ODA-funded interventions, the prioritisation of companies' interest should never jeopardise environment and development outcomes. private sector engagement fits likely less well in many Ecosystems and Biodiversity interventions and it does not fit in all activities in forestry either.

Finnish expertise was appreciated by the multilateral and intergovernmental partners. The FAO projects working on forest management information offer evidence that this expertise has been available to these partners. There is much more room for incorporating the Finnish private sector engagement in the multilateral and intergovernmental partnerships whether it is project based or core funding. Although not practiced in the past, MFA could consider adopting earmarking in its future funding decisions to these institutions.

Specific Action Points for MFA Finland and Embassies to address action area 4:[26]

1. Make the 'forest management information systems-to-Compliance Ladder' a Team Finland programme line. Develop a standardised, three-phase offer (pilot via Finnpartnership; procurement via PIF; scale via EFSD+/Team Europe Initiatives) for target countries where EU Deforestation Regulation-driven compliance and national forest management information systems upgrades coincide (e.g. Tanzania, Vietnam, Côte d'Ivoire). Embassies convene authorities, EU Delegations and firms to co-design pilot scopes and map ladder steps to concrete tenders.
2. Use PIF proactively to bundle multi-year operation and maintenance into forest management information systems procurements. Issue guidance and sample Terms of Reference language for PIF-financed projects requiring at least 3–5 years of funded operation and maintenance, training-of-trainers and local service-hub development; embassies support buyers to structure these in tender documents.
3. Create a 'Nordic Nature-Data and Water–Forest Nexus' call for consortia. With Sweden and Denmark, launch a light-touch Nordic expression-of-interest window to assemble consortia that combine Finnish forest management information systems/monitoring, reporting and verification, Swedish modelling/land-use analytics and Danish water/ecosystem engineering. Prioritise alignment with Team Europe Initiatives and Global Gateway pipelines where EU scale and visibility are highest.
4. Institutionalise Embassy–EU Delegation deal-flow sessions. Quarterly, embassies convene Finnish firms, EU Delegations and international financing institutions to review upcoming Global Gateway/Team Europe Initiative opportunities and EFSD+ guarantee windows, helping small-, and medium-sized enterprises navigate requirements early (Environmental, Social, and Governance/human rights-based approach, MEL, interoperability). Track outcomes in a simple pipeline log.
5. Stand-up a 'Compliance Readiness Facility' for EU Deforestation Regulation partners. Through Finnpartnership and small technical-assistance envelopes, support producer-country agencies and value chain actors (e.g. cocoa in Côte d'Ivoire) with farm-mapping pilots, legality assurance design and buyer dialogue – positioning Finnish traceability providers for subsequent procurements.
6. Pair Finnfund pipeline building with Embassy market creation. Task embassies to identify investable local service providers (operation and maintenance hubs, data-service micro-, small-, and medium-sized enterprises) and introduce them to Finnfund for catalytic financing where relevant; position Finnish tech firms as long-term partners to these investees.
7. Publish open, reusable Terms of Reference modules for forest management information systems/monitoring, reporting and verification/traceability. MFA hosts modular Terms of Reference clauses (interoperability, open standards, human rights-based approach, gender, multi-year operation and maintenance) for use by partner governments and EU Delegations; this lowers transaction costs for buyers and aligns tenders with Finnish strengths.
8. Strengthen early-stage co-creation support via Finnpartnership. Direct Finnpartnership outreach to Forests, Ecosystems and Biodiversity targets and encourage twin-track use of its business partnership support and business-to-business Matchmaking for consortium

26 These specific action points are generated based on the evaluation evidence and making use of AI in analysing the vast data and formulating the points.

formation and country piloting; embassies help broker MOUs with agencies and research institutes.

9. Embed human rights-based approach/ Environmental, Social, and Governance capacity building in every ladder step. Require human rights-based approach, gender equality and stakeholder participation deliverables in pilots, procurement and investment phases, ensuring social licence and stronger evaluation scores in EU pipelines; provide a simple checklist for embassies to monitor.
10. Track and report the private sector instrument pipeline results annually. Introduce a light results chain for the private sector engagement pipeline (entries via Finnpartnership; PIF contracts signed; EFSD+-backed investments; operation and maintenance jobs created; climate/biodiversity indicators) and publish an annual summary to drive learning and accountability.
11. Coordinate with EU on Team Europe Initiative/Global Gateway country roadmaps. Ask each embassy to contribute a short Forests, Ecosystems and Biodiversity annex to the Team Europe Initiative/Global Gateway roadmap with: ladder opportunities, candidate buyers, and near-term tenders; align with EFSD+ platforms to time guarantees against procurement cycles.
12. Clarify and communicate instrument roles to companies. Publish a one-page "Which instrument when?" explainer (Finnpartnership = pilot/entry; PIF = public buyer procurement; Finnfund = investment; EFSD+/Team Europe Initiatives = scale and guarantees), with point-of-contact per embassy and quarterly clinics for small-, and medium-sized enterprises.

Action point 7. Look into more effective methods to support private sector and civil society organisation collaboration.

Related conclusions: 12, 13

Finnpartnership's business partnership support is a challenging instrument for company and CSO partnerships. Here, the MFA could consider adapting the instruments towards the direction of Denmark's Danida Green Business Partnership. It makes funding available to CSO actors in the private-public consortium as advance payments.

Action point 8. MFA and its implementing partners, Finland's embassies and Finnfund require sufficient human and financial resources to actively engage Finnish private sector in Forests, Ecosystems and Biodiversity-interventions.

Related conclusions: 10, 11, 12, 13

In order for it to be effective in engaging Finnish private sector engagement, MFA and its implementing partners, Finland's embassies and Finnfund need to plan, implement and monitor private sector engagement. MFA needs to allocate adequate human and financial resources for the task.

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Annex 1: Methodology and analytical process

Overall approach and theory of change

The sub-sector evaluation aims: (i) to explore beyond the project and programme level to shed light on aggregate and catalytic effects and synergies between actions, actors, instruments and policy-influencing activities within and across the sub-sector; and (ii) to establish how these encourage and enable wider changes at geographic, sectoral and/or institutional scales, including the role of private sector development and implications for the portfolio and policy level. Its design concept is that of a 'theory-based', 'macro-level' and 'realist' evaluation. Being **theory-based**, it is built upon a theory of change embracing the logical connections between inputs and instruments, short-range, medium-range and long-range results, and impacts, and hence emphasising the plausibility of assumptions and causal links between steps in the design logic. Being **macro-level**, it focuses on development cooperation across multiple interventions, locations, and the 15 years of 2010–2024. And being **realist**, it is embedded within a theory of change that is grounded in the large-scale, long-term development context that applies to those same multiple interventions, locations, and years.

As explained in Chapter 2.2, this approach requires the use of macro-level definitions of OECD Development Assistance Committee's performance criteria such as effectiveness, impact and sustainability, rather than the intervention-level definitions that are applied to individual projects. It also requires a theory of change that robustly reflects current realities of large-scale context, that embodies logic supported by evidence, and that covers all the main pathways of cause and effect by which results can be obtained in the sub-sector. The MFA's existing sub-sectoral theory of change (MFA, 2023) was therefore reviewed during the inception phase (28 Nov 2024 to 11 Mar 2025), and an updated theory of change prepared for the sub-sector that was based on assumptions in Table 6. Interventions funded wholly or partly by MFA were then assessed against the short-, medium- and long-range results in the theory of change. These results were defined respectively as (i) the initial or 'first generation' results, (ii) the later or 'second generation' results, and (iii) the strategic consequences leading to impact.

The evaluation team adopted the EQs outlined in the Terms of Reference (annexed in the synthesis report), with EQs 1 and 2 being specifically designed for the sub-sector evaluation, and thus are answered in this report. EQs 3 and 4 will be addressed in the synthesis report. To ensure a structured and transparent approach to evidence collection and analysis, the evaluation team developed a matrix that divided each EQ into more manageable sub-EQs and listed the types of evidence required to answer each, the methods used to collect that evidence, and the data sources to be consulted. The matrix thus served as a central tool to guide both data collection and analytical consistency across the evaluation. The following methodology was applied to support the triangulation of findings in Chapter 4 of this report and to support development of the conclusions in Chapter 5.

Table 6 Assumptions and logical steps in the theory of change for the Forests, Ecosystems and Biodiversity sub-sector

From long-range results to impact: • Improved policy coordination and consensus in partner countries to ensure sustainable management of forests and other renewable natural resources with the involvement of related sectors (water, energy, climate change, agriculture, etc.) and actors at local, subnational and national scales. • Sustainable budget allocations to support long-term sustainable management of forests and other renewable natural resources for economic development and employment, water supply and biodiversity. • Political environment in partner countries remains supportive of actions to achieve Forests, Ecosystems and Biodiversity-related SDGs and Multilateral Environmental Agreement goals so that sustainably-managed forests and other ecosystems continue to store carbon, protect biodiversity and provide other goods and services that support employment, income and added value. • Geopolitical conditions support continued shared priorities on sustainable development (e.g. SDG 15), biodiversity (e.g. Kunming-Montreal Global Biodiversity Framework) and climate change (e.g. Paris Agreement), and do not introduce major new barriers to cooperation.
From medium-range to long-range results: • Increased national capacity to support effective management of forest ecosystems and other renewable natural resources: ◦ for improved climate change mitigation and adaptation, forest resources, biodiversity. ◦ for greater inclusion and equity outcomes for poor and vulnerable/impacted groups and forest-dependent communities; ◦ for sustainable use of forest resources and other renewable natural resources by communities and businesses. • Transboundary collaboration for sustainability within and between countries on management of shared ecosystems and ecosystem services. • Increased job creation, economic growth and productive uses based on enhanced value chains and sustainable use of renewable natural resources. • Political environment in partner countries provides a conducive environment for private sector investment in forest industries and other renewable natural resource enterprises.
From short-range to medium-range results: • Increased national research and knowledge management capacity to meet needs: ◦ for guidance on policies, laws and practices related to sustainable renewable natural resource management and nature-based solutions to climate change; ◦ for public education, awareness raising and participation on sustainable renewable natural resource management and nature-based solutions to climate change. • Increased national capacity: ◦ to appreciate and integrate the value of sustainable renewable natural resource management to all economic sectors; ◦ to promote sustainable supply chains, improved resource efficiency and environmental sustainability of forest industries; and ◦ to encourage and enable equitable benefit sharing from sustainable renewable natural resource management. • Government policies recognise the importance of rights-based approach, especially land tenure, and gender equality and private sector in efficient and sustainable forest and other renewable natural resources management • Governments and public-sector organisations adopt a more open and transparent approach to sharing information generated and maintained through systems established through MFA support.

From inputs/instruments to short-range results:

- Adequate allocation and use of MFA funds and instruments (coherently with interventions by others) to support:
  - assessment/mapping of renewable natural resources to clarify use and ownership rights and management responsibilities; and
  - participatory research, education and knowledge sharing on renewable natural resources to facilitate sustainable ecosystem management.
- Adequate allocation and use of MFA funds and instruments (coherently with interventions by others) to ensure:
  - that renewable natural resource user groups are encouraged and enabled to manage ecosystems sustainably in partnership with national authorities;
  - that ecosystems come increasingly under conservation and/or participatory, sustainable, and integrated management;
  - that micro, small, and medium-sized enterprise businesses can build viable, sustainable supply chains using diverse ecosystem goods and services; and
  - that public institutions benefit from community and business partnerships promoting sustainable ecosystem management.
- Recognition that forests and other renewable natural resources are part of a nexus that also includes climate, energy, water, and food/nutrition security, and that the whole nexus is fundamental to sustainable development.

Source: Evaluation team

Portfolio review

A review of MFA's portfolio was carried out for two purposes: (i) to delineate the four relevant sub-sectors while gaining a better understanding of their characteristics, such as geographic distribution, channels and instruments; and (ii) to lay the groundwork for establishing the evaluation sample (see 'Desk studies and organising evidence' below). For the first purpose, the evaluation team started by 'cleaning' the data in a spreadsheet received from the Development Evaluation Unit (EVA-11) of MFA on 19 November 2024. The dataset spanned the years 2015 to 2022 and included 2,746 rows of data, representing 2,124 interventions with unique donor project numbers. The first step involved categorising interventions as either 'in scope' or 'out of scope'. All interventions in the natural resources policy priority area (labelled '4' in the spreadsheet) were included in the scope. As not all interventions had such a number, particularly earlier ones, sector codes were used to classify these. Keyword searches were also used to identify individual interventions for inclusion.

Interventions deemed relevant to the evaluation were further assigned to the sub-sectors, mostly guided by sector codes. Those with an identifiable Environment and Natural Resources focus but not clearly linked to any sub-sector were categorised as 'general'. Interventions with explicit objectives in agriculture or exclusive focus on sanitation and/or hygiene were excluded, as specified in the Terms of Reference. The resulting sub-sector portfolios were reviewed and validated by the sub-sector teams, yielding a final Environment and Natural Resources portfolio comprising 286 interventions. Sub-sector specific portfolios were then extracted and provided to the sub-sector teams to inform their work.

Three constraints were applied to the data for analysis. First, only **commitment data** (myönnöt) were used, as they were considered more informative than disbursement data. Second, where interventions had **multiple purposes**, including elements related to other sectors, only the share of resources allocated to one of the Environment and Natural Resources sub-sectors was included in the portfolio. Third, to improve the clarity of graphical presentations of the portfolio's **geographical**

distribution, country commitments below EUR 1 million were aggregated under the category of 'Other'. Finally, only ten **delivery channels** were used to characterise the portfolio: Development Funds; Finnish Government and Embassies; International Financial Institutions; Multilateral and Intergovernmental Organisations; Non-Governmental (non-profit) Organisations; Private Sector; Recipient Governments; Research and Academic Institutions; United Nations (UN) Agencies; and Other.

As the portfolio review used a dataset for the years 2015–22, it included neither the oldest nor the most recent interventions in the time-scope of the evaluation (2010–24). To correct for this, some of these older and younger interventions were included in the moderate and intensive studies. As interventions initiated in 2023 or later were unlikely to demonstrate measurable results, particularly long-term impacts, their main contribution here was in assessing design relevance. Older interventions presented other challenges, in terms of missing documents and informants, or limited recall of details by knowledge-holders. Even so, these interventions remain relevant for assessing relevance, impact and sustainability and were mostly assessed through existing evaluation evidence and documentary materials.

Since the data received from the MFA covered Finland's exclusive ODA budget, which is administered by the MFA, it excluded Finnfund investments. These investments were, however, considered significant for Finland in the area of Environment and Natural Resources and as a part of the private sector engagement intensive study on Finnfund (annexed to the evaluation's synthesis report), a portfolio analysis of Finnfund's investments in the sector was conducted. This was based on data received from Finnfund on 4 April, 2025, which covered their Environment and Natural Resources investments in 2015–2023.

Sampling

A purposive and tiered sampling approach was used to select interventions for moderate and intensive studies, balancing interventions that were mature enough to yield meaningful insights while excluding those too recent to show results and those too distant in time to be effectively analysed. Interventions for moderate and intensive studies were prioritised based on recommendations by the Reference Group and on the interventions' likely ability to provide substantive findings on effectiveness, impact and sustainability, ensuring a focused and methodologically sound assessment. By making it possible to select interventions to ensure balanced coverage of context, instrument and geography, the review allowed the evaluation to proceed with a robust evidence base.

Extensive document analysis

It was agreed with EVA-11 from the outset that the evaluation would rely primarily on secondary data. As there was vast amount of policy papers, evaluation reports and other reports, intervention level documentation, etc., a structured and systematic approach to retaining and storing information was needed. A standard system for consistent collection and organisation of evidence by all evaluators was developed in the inception phase, and further refined in the implementation phase (12 Mar to early Oct 2025). This structured library resource was then available to support natural language processing (see below) as a way to find and organise dispersed references to relevant topics.

Desk studies and organising evidence

A sample of the Forests, Ecosystems and Biodiversity portfolio was explored through 'moderate' and 'intensive' desk studies. The sample was built based on recommendations by EVA-11 and the Reference Group, and supplemented with other interventions to ensure that all key MFA instruments and channels were covered. The main source of information for each of these past and on-going interventions was the most recent of an annual report, a mid-term review, a final report or a final review. In each moderate study the reviewer searched the key document for evidence of: (i) achievements; (ii) connections, synergies and policy-relevant effects; (iii) private sector development opportunities; and (iv) Finnish added value, and organised the evidence in a project results framework, 'proforma' (Table 7). Additional documents and other sources (such as informants) were also used to the extent that the reviewer felt necessary to capture useful evidence.

Table 7 Structure of the proforma used to organise evidence in moderate studies

Sub-sector; name of intervention:	
Document(s) reviewed:	Reviewer:
Narrative overview: scale and kind; details on location, duration, modality, budget.	
Development/environment achievements.	
Connected interventions, synergistic and policy-relevant effects.	
Finnish private sector development opportunities.	
Finnish added value.	
Other observations.	
References.	
Acronyms and abbreviations used in the proforma.	

Source: Inception Report. The proforma was colour coded to aid data compilation.

A small number of interventions were chosen for **intensive** study because of their clear importance for major policy-relevant themes and future priorities in the Environment and Natural Resources policy area. They tended to be complex actions or engaged in complex areas of work, with many implications for policy, practice and partnership, so they needed more thorough investigation than the others in the sample. In these intensive studies, project documents and evaluations provided by MFA were used as a starting point, but multiple interviews with knowledge-holders were also undertaken along with extensive web searches. Evidence obtained from all sources in all intensive studies was organised in a slightly more extensive proforma (Table 8). A library of proformas was accumulated during the evaluation that was used as a reference for analysis and reporting. Table 1 in Chapter 2 lists all completed studies.

Table 8 Structure of the proforma used to organise evidence in intensive desk studies

Sub-sector; name of intervention:	
Document reviewed:	Reviewer:
Narrative overview: scale and kind of the intervention; details on location, duration, modality, budget.	
Development/environment achievements of MFA in target location.	
General achievements resulting from MFA intervention.	
MFA achievements that involved private sector actors.	
Lessons learned from MFA achievements and failures.	
Finnish private-sector engagement (private sector development) in Finland or target location.	
Achievements resulting from Finnish private sector engagement.	
Lessons learned from Finnish private sector development achievements and failures	
Opportunities identified for Finnish private sector development in future.	
Finnish added value.	
Other observations.	
References.	
Acronyms and abbreviations used in the proforma.	

Source: Evaluation team. The proforma was colour coded to aid data compilation.

Interviews and survey

Interviews helped to correct information gaps and added depth to an understanding of MFA's intervention logic. Their role was to enrich the proformas (especially those compiled for intensive studies), and to provide additional context on partnerships, implementation experience, programming and policy priorities. Interviewees were categorised into three main groups, and in the Forests, Ecosystems and Biodiversity sub-sector they comprised 31 policy-level, 25 intervention-level, and 6 private-sector knowledge-holders. These were individuals working at non-Finnish public research institutions (5), MFA headquarters and embassies (10), other Finnish ministries (3), Finnish consulting firms (10), international organisations (8), Finnish non-governmental organisations (4), partner country non-governmental organisations (6) and private-sector actors both Finnish (2) and non-Finnish (5). A full list of interviewees with institutional affiliations was submitted to EVA-11, and an anonymised list is given in Annex 9.

Cutting across the sub-sectors, a private sector engagement survey engaged 19 respondents. The first invitation wave for the survey was launched on 21 May 2025, followed by two more invitation waves. The invitation was sent to a total of 212 recipients. By 21 July 2025, the survey had received 19 responses. Most of the respondents were private companies, but there was also one association and one public research institution among them. Nearly third of the respondents (32%/6 organizations) were active in water sector, four of them in construction, two in soil and minerals, two in environmental monitoring, and the rest in other industry sectors. A succinct report of the survey's results is annexed to the evaluation's synthesis report.

In-country data collection

In addition, in-country consultations were conducted in Tanzania and Vietnam by national consultants to assess interest in and demand for (a) digital (including updated) forest resource data, and (b) digital (e.g. smartphone) tools for managing those data. The consultations were also to assess and report on the extent to which this demand is currently being met and by whom in the context of Finnish and other forestry interventions and opportunities in the two countries. Stakeholder input was essential to triangulate evidence from desk review, project reports, and proformas.

Geospatial analyses

Geospatial analysis was used to interpret and visualise the spatial dimensions of the implementation and impact of two interventions in Tanzania.

Like-minded peer country review

The methodological approach employed a theory of change lens, aligned with the Forests, Ecosystems and Biodiversity sub-sector's strategic objectives. The reconstructed theory of change for Forests, Ecosystems and Biodiversity sub-sector was used to define expected short-, medium-, and long-range results across environmental, social, cooperative, and economic dimensions. This framework was applied to each country case, enabling a structured assessment of intervention pathways and their results.

Case studies were selected for their documented transformative potential and alignment with participatory, rights-based approaches. Denmark's work in Bolivia and Switzerland's in Bolivia, Mongolia, Lao PDR, and southern Africa were reviewed using secondary data sources including published evaluations, academic literature, and policy documents. For Finland, data on WWF Finland, Siemenpuu Foundation, and IUCN programme partnerships were drawn from internal programme documentation, evaluation reports, public sources, and interviews.

Market analysis

A brief, general-level business and market opportunity analysis was conducted focusing on the markets with specific country-focus covered by the sampled interventions' intensive studies in each sub-sector. It provided information regarding the local context and business environment, demand and competition within the sub-sector, and a description of the Finnish companies' offer relevant to the market demand. Its purpose was to provide evidence and insights with which to support answering EQ 2.1: *What concrete and context-specific opportunities, entry points and models are there for Finland for partnering with Finnish and local companies and economic actors within the sub-sector topic(s) in the next five years?*

The market analysis was based on information gathered as part of the desk review, interviews with representatives of government, business and international organisations from the target location, as well as interviews and survey with Finnish companies with previous experience or interest in

the target markets. In the case of Forests, Ecosystems and Biodiversity, the market analysis was based on the in-country assessments conducted by the evaluation team's national experts in Tanzania and Vietnam, supplemented and triangulated by desk review. The desk review considered in particular sources such as the Multilateral Development Banks' and the UN's analyses, market location country government reports and key development partners' resources, as well as data and resources from various business-membership organisations and civil society and research organisations.

The market analyses used the following template which indicates the focus of inquiry in the form of its headings:

Summary:
1. Local context and business environment
1.1 Description of the focus area
1.2 Status in the country
1.3 Focus-area development needs and challenges
1.4 General private-sector business environment
2. Demand within the focus area
2.1 Typical client/customer segments
2.2 Scale of demand and 5–10-year outlook
2.3 Regional differences (if any)
3. Competition/Current offering within the focus area
3.1 Key companies active in the sector
3.2 Estimated current market size reached by businesses
4. Finnish companies' offer
5. Conclusions
References/documents reviewed:

Natural language processing

Natural language processing was used to search through over 140 evaluation reports provided by EVA-11 in the inception phase to identify and structure content related to the evaluation's sub-sectors. The approach enabled the evaluation team to explore document content efficiently, going beyond keyword searches to understand the broader thematic coverage. All documents were digitally processed to extract usable text content, accounting for the wide variety of formats and layouts. In cases where the text could not be extracted directly (e.g. scanned or stylised PDFs), automated character recognition tools were applied to retrieve the information. The extracted content was cleaned and standardised to ensure it could be analysed consistently across the corpus.

A modern topic modelling technique was used to classify text segments into pre-identified sub-sectors relevant to the evaluation, such as water, energy, biodiversity, and the private sector. This approach is based on advanced language models that can recognise context and meaning in full sentences, not just individual words. This allowed for a more accurate thematic classification of the content. The method was unsupervised, meaning it did not require pre-labelled training data, and was adapted through iterative testing and expert feedback to improve performance. To ensure

reliability, several verification steps were conducted. These included visual checks of common topic terms, targeted reviews of document summaries, and random sampling of sentences to assess thematic consistency. Expert reviewers also participated in validating the topic assignments and refining category definitions where needed. This combination of automated and manual methods helped ensure a balance between coverage and accuracy.

The results were integrated into an interactive dashboard that allowed the evaluation team to filter, combine, and explore document content by sub-sector. This helped identify patterns, gaps, and areas of emphasis across the portfolio. Importantly, the method was used as a tool to structure the information, not as a substitute for expert judgement. It contributed to better targeting desk reviews and provided a basis for further analysis and triangulation. The technique enhanced efficiency in navigating large volumes of text and provided a structured basis for comparison across documents. It offered a better understanding of themes than conventional keyword searches. However, it required significant testing, validation, and expert involvement to ensure interpretability. Some technical limitations related to document formats and overlapping topics remained, and Natural language processing was used as a complementary tool rather than a stand-alone evaluation method.

Use of artificial intelligence

AI has been used in this report as a search tool to identify relevant material for wider contextual research beyond the MFA portfolio, including targeted searches to provide comparative insights and background information relevant to the sub-sector. AI tools were also occasionally applied for language support, including proof-reading and enhancing the clarity, coherence, and readability of the text. All sources and outputs generated through AI have been fully reviewed, verified, and adapted by the author, ensuring that the final content reflects accurate analysis, aligns with the evaluation findings, and maintains the author's own judgment and conclusions.

MFA's recently launched AI tool 'OpenEval' was used to enrich the desk review in identifying results of Finnish ODA in the Forests, Ecosystems and Biodiversity sector reported in previous evaluation reports. For identifying the most promising markets, evidence from market analyses and like-minded peer country studies was enriched by AI-assisted online research, where Finnish private sector strengths (digitalisation, forest management and rights-based governance) and the related strong industrial sectors (remote sensing and forest information systems such as national forest inventories; measurement, reporting and verification tools that enable compliance with deforestation-free supply chain requirements; biodiversity monitoring solutions; forest-water nexus analytics; and protected-area asset management), were provided to ChatGPT-5 with a request to identify potential developing country markets. The results were triangulated by Forest Law Enforcement, Governance and Trade, Global Gateway and other EU sites' sources as well as by the Tanzania and Vietnam country consultations of this evaluation and made use of in the Findings 16 and 17. For the chapter 4.6, evaluation team's evidence and analysis as provided in the market analyses, like-minded peer country studies and desk review as well as from this report's chapter 4.4. was processed with ChatGPT-5 to generate proposed private sector engagement approaches. Out of several generated, the evaluation team picked three and developed them further.

Triangulation

The evaluation synthesised evidence through a structured, multi-source approach to ensure the reliability and depth of findings. A comprehensive desk review formed the foundation, covering programme documents, annual reports, evaluations, and strategic guidance. This was complemented by semi-structured interviews with MFA staff, implementing agencies, Finnish embassies, partner-country stakeholders, and private-sector representatives, which provided qualitative insights into both successes and bottlenecks. The proformas were used to organise evidence and systematically analysed to capture reported outputs and outcomes, while like-minded peer country comparisons offered a benchmark for understanding Finland's positioning relative to donor peers, highlighting areas of convergence, differentiation, and potential learning. The evidence was then triangulated and synthesised to ensure that findings and conclusions were grounded in multiple perspectives. Insights from proformas and like-minded peer country comparison were cross-referenced with interview evidence to validate reported results and uncover gaps, while contextual factors were incorporated to explain variations in performance. This layered synthesis enabled the evaluation to integrate quantitative data, qualitative findings, and comparative insights into a coherent narrative.

Limitations

In terms of the Forests, Ecosystems and Biodiversity portfolio review, the evaluation looked at documentation provided by MFA for the interventions identified during the inception. The quality and comprehensiveness of the documentation varied and often consisted of documents related to design and appraisal or mid-term evaluations rather than ex-post evaluations or completion reporting.

Reporting of results across the documents reviewed is inconsistent, results are interpreted differently and reflect interventions' own timescales. With the multilateral portfolio, challenges of attribution exist.

Due to evaluation's resources, intervention related interviews in partner countries were only possible in Tanzania and Vietnam. These interviews, together with the interviews carried out with Finnish and international partners were used to triangulate the findings of portfolio review from intervention documentation. Only a proportion of these interventions were accompanied by relevant implementing partner interviews (<40%).

For interventions where there are significant concerns around commercial confidentiality, access to intervention data was limited, with intermediaries (e.g. Finnfund) providing self-reported progress.

The geospatial studies tackled several data quality issues. Despite extensive efforts to clean and standardise the original woodlot and village land forest reserve datasets, several data quality issues persist that could not be fully controlled. Initial inconsistencies, including overlapping polygons, missing or incorrect geometries, and misplaced woodlots, point to variations in data collection and previous processing protocols. Significant effort was required to explore, clean and correct these layers before analysis could proceed. With PFP gaps in metadata, particularly the absence of tree species information and beneficiary gender in many entries, limited the ability to disaggregate findings and may bias conclusions about PFP's performance and inclusivity. Due to the data inconsistencies, the total area and number of woodlots reported by PFP do not fully align with the outcomes of our evaluation. With FORVAC data common issues included missing or corrupted

shapefile components, empty geometries, topological and geometric errors, repeated polygons, and naming inconsistencies that hindered proper alignment with the official village land forest reserve list from FORVAC's Completion report. In some cases, polygons were either missing entirely or could not be confidently matched to listed village land forest reserves and were therefore excluded from the analysis.

Annex 2: International frameworks, agreements and initiatives relevant to the Forests, Ecosystems and Biodiversity sub-sector

Sustainable Development Goals (SDGs), in particular: • SDG 15: Life on land (all targets); • SDG 13: Climate Action (Target 13.2 on integrating climate change measures into national policies, strategies and planning); and • SDG 12: Responsible Consumption and Production (Target 12.2 on sustainable management and efficient use of natural resources).
Convention on Biological Diversity (CBD), and in particular: • the *Strategic Plan for Biodiversity*, including the Aichi Biodiversity Targets; • the *Kunming-Montreal Global Biodiversity Framework*, which includes 23 targets on halting biodiversity loss and achieving sustainable use of ecosystems by 2030 (linked to targets under SDGs 15 and 14) plus four goals on living in harmony with nature by 2050, and a global target to protect 30% of the planet for nature by 2030 (known as 30 x 30); and • the 2024 *World Coalition for Peace with Nature: Call for Life*.
United Nations Forum on Forests in particular the UN Forest Instrument and Strategic Plans for Forests (2007–2030), which adopted the Global Forest Goals (2017) focusing on sustainable forest management (sustainable forest management), sustainable development of forest resources, forest protection, and increasing forest cover by 2030.
UN-Reducing Emissions from Deforestation and Forest Degradation (UN-REDD), which acts as a key policy mechanism under the UN Framework Convention on Climate Change (UNFCCC) to protect tropical forests and, through monitoring, reporting and verification, measure the reduction of greenhouse gas emissions from deforestation and forest degradation to underlie carbon credit payments.
New York Declaration on Forests, a non-legally binding declaration that aimed at halting deforestation between 2014–2030, through partnerships between governments, private sector corporations, and CSOs.
UNFCCC Paris Agreement (2015), which aims to limit global temperature rise by reducing greenhouse gas emissions and requires parties to prepare and update Nationally Determined Contributions to achieving this goal, including by avoiding emissions from harm to high carbon-density ecosystems such as forests and peatlands.
Biodiversity-related conventions, which as well as the Convention on Biological Diversity itself include the Convention on International Trade in Endangered Species of Wild Fauna and Flora, the Convention on the Conservation of Migratory Species of Wild Animals (CMS), The International Treaty on Plant Genetic Resources for Food and Agriculture (the 'Plant' or 'Seed' Treaty), Convention on Wetlands (the 'Ramsar' Convention), the World Heritage Convention, and the International Plant Protection Convention.
UN Decade on Ecosystem Restoration (2021–2030) to prevent, halt, and reverse the degradation of all natural ecosystems.
Bonn Challenge (2011–2030), which aims to restore 350 million ha of deforested and degraded landscapes by 2030.
Glasgow Leaders' Declaration on Forests and Land Use. Over 140 leaders, accounting for more than 90% of the world's forests, committed themselves to working together to halt and reverse forest loss and land degradation by 2030.
Global Forest Finance Pledge. Twelve countries pledged to provide USD 12 billion in public climate finance in 2021–25 to support action in developing countries, including on restoring degraded land, tackling wildfires and advancing the rights of indigenous peoples and local communities.
UN Secretary-General António Guterres has called for an end to a 'war' on nature that is driving the biosphere towards a crisis of Earth system breakdown and has called making Peace with Nature "the defining task of the 21st century". This is very relevant to the sub-sector, since 'forests, ecosystems and biodiversity' add up to a good proxy for nature.

Annex 3: Environment and Natural Resources in Finland's development policies

Finland's Development Policy Programme: Government of Finland Decision-in-Principle, 16 Feb 2012 (MFA, 2012a), pp. 37-38:

- "Access to energy can be increased sustainably, particularly by promoting the energy efficiency and the widespread, sustainable use of renewable energy sources."
- "At their worst, environmental degradation, land ownership and disputes over the use of natural resources cause violent conflicts. Correspondingly, transparent and fair management of natural resources increases social stability and plays an important role in conflict prevention and resolution. Shared natural resources and joint agreements as well as institutions related to their use can build confidence between countries and communities."
- "Communities' own coping mechanisms and their capacity to participate in decision-making about the use of natural resources will be strengthened."
- "The principles of a human rights-based approach, policy coherence, openness and good governance must guide also the use of water resources and forests."
- "Balanced and integrated management of water resources is a prerequisite for ensuring the various needs for the use and protection of waters as well as human well-being."
- "The role of forests as a source of food security and livelihood as well as carbon sinks to combat climate change is indisputable. Forests sustain biodiversity and the productivity of land, counter desertification as well [as] strengthening the viability of arid areas and food security of the people dependent on those areas. Community forestry is an important way to achieve sustainability, a more equitable distribution of benefits and better livelihoods."
- "The implementation of the Rio Conventions – on Biodiversity, Climate Change and Desertification – has clear development impacts and inter-linkages [including] the impacts of climate change on biodiversity and the application of an ecosystem-based approach to the adaptation to climate change."

Finland's Development Policy, One world, common future – towards sustainable development (MFA, 2016a), p. 22:

- "Finland's actions strive to promote that peoples possibilities to produce or buy food have improved; the number of people with access to high-quality water supply has increased and more people have access to and use decent toilets; developing countries' investments to sustainable energy solutions have increased, and the share of renewable energies has increased and that of fossil energies decreased; and the sustainable management, use, protection and control of renewable natural resources and ecosystems, such as forests and water bodies, have become more widespread. Finland can provide excellence in the fields of cleantech and bioeconomy."
- "Finland is a country of clean technology and bioeconomy, boasting excellence in the realisation of well-functioning, environmentally-sustainable and climate-smart solutions in these goal areas. Finland also has a lot to offer in fostering the management of natural resources and the sustainable use of forests. Finland will support developing countries' public, private and collective producers in the fields of water, food and energy supply to improve their know-how and ability to attract investment and partners and to make use of the latest clean technologies and expertise."
- "Finland will support developing countries' efforts to improve access to water, food and energy, paying attention to women's rights. Better management of natural resources will be supported by Finland bilaterally, regionally and multilaterally. Finland will contribute to international and EU policy-making in climate, energy, environmental, agricultural and corporate social responsibility issues, supporting developing country dialogue. Finland will fund collaboration between research and educational institutions, companies, civil society and the public sector to generate necessary know-how."

Report on Development Policy Across Parliamentary Terms (MFA, 2021), p. 13:

- "Finland provides long-term support for climate change mitigation and adaptation, development that is low in emissions and climate resilient, as well as biodiversity protection. Finland promotes the sustainable management, use and protection of renewable natural resources and ecosystems, including forests and water resources, and the halting of desertification and soil degradation. Finland also promotes afforestation measures to ensure the sustainable management of forest resources, and aims for increased protection and sustainable management of forest and water areas. Peaceful transboundary water resources management is part of Finland's foreign and development policy. Finland supports the sustainable management and exploitation of mineral resources."

- "Finland's measures towards the achievement of the water-related targets of the 2030 Agenda are guided by the *Finnish Water Way – International Water Strategy of Finland*, which was adopted by five Finnish ministries in 2018 and extends until 2030. Finland promotes the production and sourcing of reliable and sustainable renewable energy as well as energy efficiency improvements and in this work takes into account the opportunities provided by circular economy."
- "Climate change and biodiversity are considered as a whole. Diverse, well-functioning ecosystems store carbon and are vital for climate change mitigation as well as for ensuring food and nutrition security, clean air and water access."
- "Finland strives for reducing vulnerability of people and societies to extreme weather events and natural disasters. Weather and climate services and early warning systems are employed to improve the preparedness, crisis resilience and carrying capacity of countries from the climate change perspective, tapping into the solid Finnish competence and extensive international experience in these fields."

Theories of Change and Aggregate Indicators for Finland's Development Policy (MFA, 2023), p. 19:

- "Climate and Natural Resources: Impacts: Climate resilience and low greenhouse gas emissions development are promoted by sustainable use of natural resources. Outcome 1: All people benefit increasingly from clean environment and healthy ecosystems, conservation, sustainable management and use of renewable natural resources, such as forests and water bodies. Outcome 2: All people have improved and equitable access to affordable and clean, sustainably produced renewable energy. Outcome 3: Vulnerability of all people to extreme weather events and natural disasters has decreased and their resilience to them increased. Outcome 4: All people have improved possibilities to produce and access safe, nutritious, and adequate food. Outcome 5: All people have improved and equitable access to basic and sustainable drinking water, sanitation services, and improved hygiene practices."

Report on International Economic Relations and Development Cooperation (Finnish Government, 2024):

- "Climate change and biodiversity loss are global problems and their mitigation and prevention require closer international cooperation. The ongoing economic transition to a production model that is not based on fossil fuels and overconsumption of natural resources creates high demand for clean energy, environmental technology and bioeconomy and circular economy solutions. The clean transition market will create significant opportunities for Finnish companies. However, the ongoing transformation also means increasing competition for these markets and their related technologies and raw materials. ... As a pioneer of environmental and climate policy, the EU must influence the international regulatory environment and standards of the sector in order to ensure the competitiveness of its own companies." (p. 18)
- "Finland supports the efforts of developing countries in the mitigation of climate change and adaptation to it, and halting biodiversity loss in accordance with its international obligations. International climate targets also create markets for environmental and climate technology and increase demand for the products and solutions of Finnish companies. Development funding can be allocated to companies that develop innovative technologies and service models for developing markets. ... Sustainable forest management mitigates climate change and helps to adapt to it. Forests are an important carbon sink and play a key role in protecting biodiversity. Forest value chains [see note] produce wood and other commodities and provide employment, income and added value. Finnish operators have expertise in forest surveys and information systems, forest industry planning, forest education and research, and small-scale producer-driven forestry. " (p. 27).

Note. "A value chain describes the full range of activities required to bring a product or service from conception, through the intermediary phases of production and delivery to final consumers, and final disposal after use. The term is usually used with a developmental connotation addressing productivity, growth and job creation in the market system (Nutz and Sievers, 2015). Inclusive and gender-sensitive value chains engage and profit male and female stakeholders equally." (MFA, 2023, p. 55).

Annex 4: FORVAC geospatial analysis - methods and results

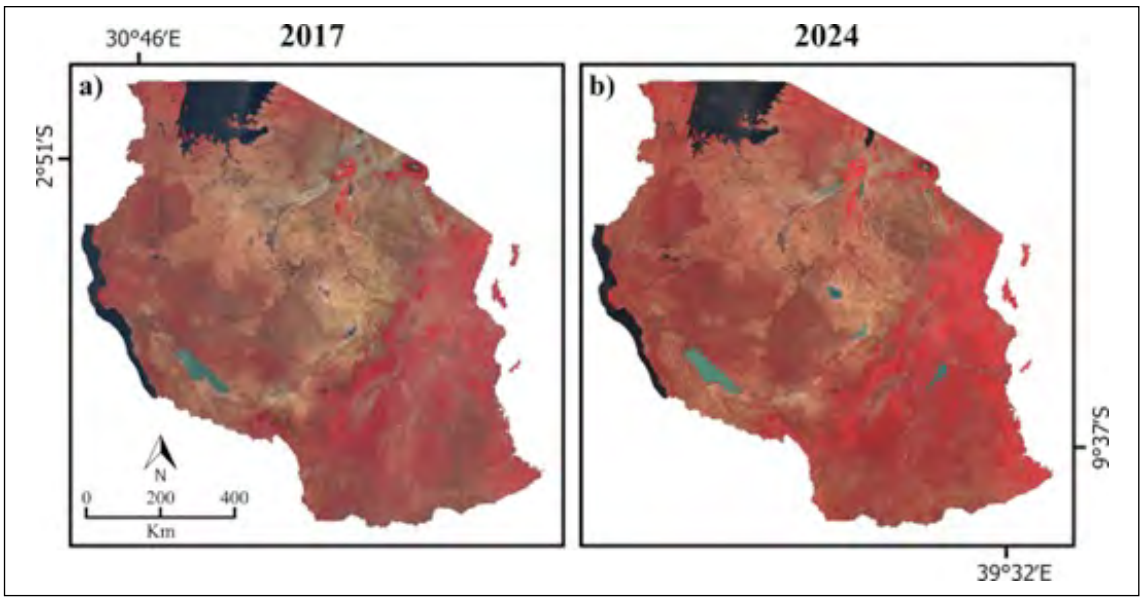
Objective

The objective of this geospatial analysis was to assess the impact of the village land forest reserves supported by the Forestry and Value chains Development programme (FORVAC) in Tanzania on reducing tree cover loss. To achieve this, we assessed tree cover dynamics from 2017 (representing the pre-project baseline) to 2024 (reflecting the current state of the village land forest reserves).

Datasets

This geospatial analysis combined freely available geographic information systems (GIS) and remote sensing datasets to assess village land forest reserves supported by the FORVAC project in Tanzania. Spatial polygon data corresponding to the village land forest reserves were obtained from the FORVAC team, while annual cloud-free 10 m 2017 and 2024 infrared composites from Sentinel-2 (Figure 14a–b), processed in Google Earth Engine, represented our analysis timesteps. To complement this, tree cover loss data (2017–2024) from Global Forest Watch, derived from 30 m Landsat imagery, were used to support land cover classification.

Figure 14 Sentinel-2 infrared composites of Tanzania for 2017 (a) and 2024 (b)



Source: Evaluation team

The initial step in our analysis framework involved the exploration, correction, and cleaning of the village land forest reserves polygon data, as significant inconsistencies were identified between the geospatial files and the final FORVAC project report. A range of issues were detected, including missing files, empty geometries, corrupted files, topological and geometric errors, duplicated polygons, naming inconsistencies, village land forest reserves comprised of multiple non-adjacent polygons, and village land forest reserves divided into multiple contiguous polygons. Table 9 provides a detailed overview of these issues and outlines the approach implemented to address each one.

Table 9 Issues identified in the village land forest reserves data and how they were addressed

DATA ISSUE	DESCRIPTION	APPROACH TO ADDRESS IT
Missing files	The FORVAC geospatial layers were shared in shapefile format. A shapefile requires several associated files (.shp, .shx, .dbf, .prj, etc.) to function properly. In several cases, one or more of these files were missing, preventing the data from being loaded and visualised.	Geospatial layers missing critical files and therefore not usable were excluded from the analysis.
Empty geometries	Some shapefiles were empty containers with no polygon features included.	Empty shapefiles were excluded from the analysis.
Corrupted files	Several geospatial files were corrupted and could not be opened or displayed correctly.	Corrupted files were excluded from the analysis.
Topological and geometric errors	Various layers presented topological problems, such as polygons with self-intersections or overlapping polygons within a single file.	All topological and geometric issues were identified and manually corrected using QGIS to create analysis-ready layers.
Duplicated polygons	Two polygons were duplicated with different village land forest reserve names.	We removed one of the polygons to avoid quantifying the same area twice.

DATA ISSUE	DESCRIPTION	APPROACH TO ADDRESS IT
Naming inconsistencies	(1) Multiple layers had the same name but corresponded to different polygon geometries. (2) Several shapefiles contained typos in their names, resulting in mismatches with the official village land forest reserves list from FORVAC's final report. (3) Some shapefiles lacked the 'village land forest reserve' suffix in their file name, making it harder to identify them as such. (4) Some layers included the 'village land forest reserve' suffix but did not match any entry in the official village land forest reserves list. (5) In a few cases, the same village name appeared twice in the report, but only one shapefile was available. (6) Several shapefiles had the same name, even though the corresponding village land forest reserve was listed only once in the report.	(1) Each polygon was reviewed in terms of geometry, name, and location to match it to the official village land forest reserves list. (1.2) When layers shared a name, we verified whether the name was included in FORVAC's final report and checked the district where the village land forest reserve was located. Based on this, only polygons corresponding to confirmed village land forest reserves were included. (2.1) We corrected typos in file names and included shapefiles that matched village land forest reserves even if their naming structure differed. In some cases, folder names matched officially listed village land forest reserves and contained valid polygons. These files were included, and the official name was added in brackets to match the report. (3) All geospatial layer names were standardised to match those listed in the FORVAC report. (4) Layers not listed in the final report were excluded. (5) When only one shapefile was available for a village listed twice, the single file was included. (6) When multiple layers had the same name, but the village land forest reserve was listed only once, we only included polygons we could confirm on maps from project reports.
village land forest reserves comprised of multiple non-adjacent polygons	Some shapefiles contained multiple, spatially disconnected polygons under a single village land forest reserve name.	Since it was unclear whether this was intentional, we retained these non-adjacent polygons under the same village land forest reserve name, as they appeared within the same shapefile.
village land forest reserves divided into multiple contiguous polygons	Some village land forest reserves consisted of multiple adjacent polygons with the same name, which may have been erroneously split.	We merged these adjacent polygons into single features, assuming they should represent a unified village land forest reserve area.

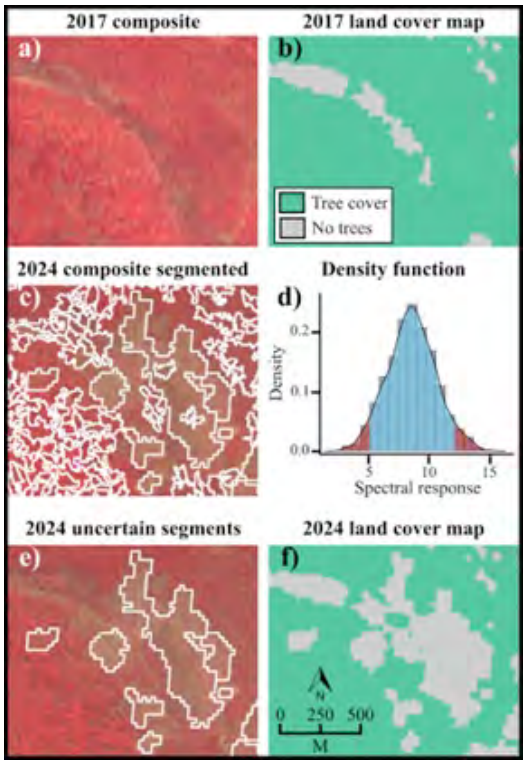
Source: Evaluation team

Identification of tree cover changes

To assess the impact of FORVAC-supported village land forest reserves on land cover, we analysed tree cover changes within and around each village land forest reserve, using external 5 km buffers as reference areas for comparison. A supervised classification of the 2017 Sentinel-2 infrared composite distinguishing between tree and non-tree cover (Figure 14a–b) was produced with the random forest algorithm using the Remotior Sensus Python package (Congedo and Barsukov, 2024), and land cover change was then detected using the hybrid method of Mas et al. (2017; Figure 15), which integrates automated and supervised steps to reduce classification errors by producing interdependent maps as recommended by FAO (1996). The 2024 Sentinel-2 composite was segmented into land cover patches (Figure 15c), compared to the 2017 map, and modelled for spectral responses to identify potential changes (Figure 15d–e). These segments were manually verified, supplemented with Global Forest Watch tree cover loss data (Hansen et

al., 2013), and integrated into the updated 2024 map, ensuring consistent detection of tree cover changes (Figure 15f).

Figure 15 Steps of the hybrid land cover change detection method



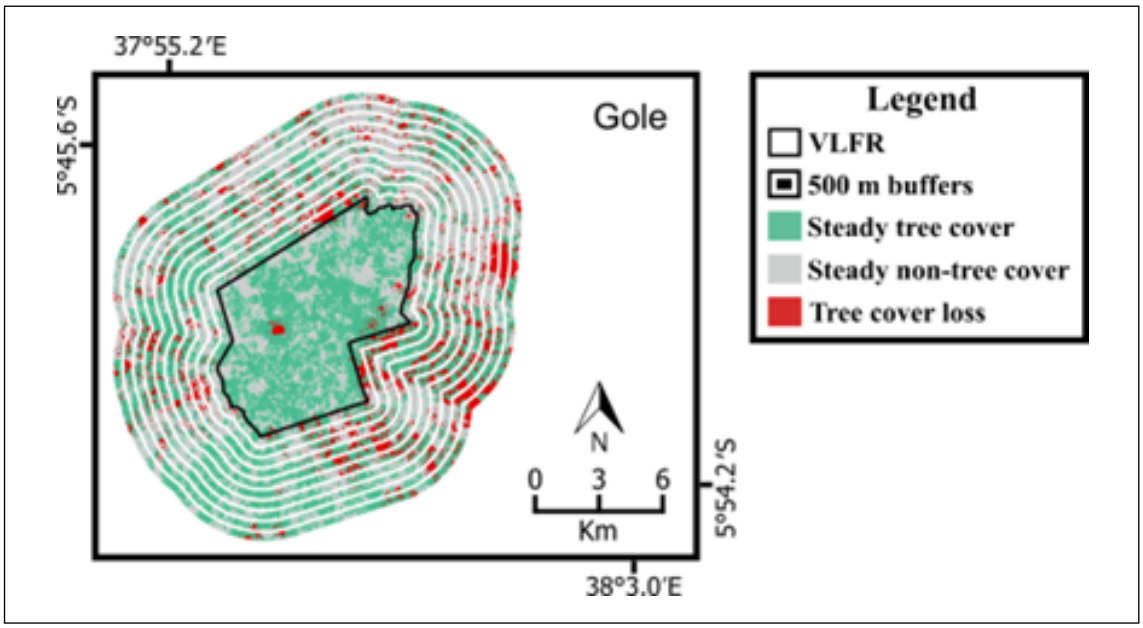
a) 2017 Sentinel-2 infrared composite, b) 2017 land cover map, c) 2024 Sentinel-2 infrared composite and its corresponding segments, d) histogram of the density function highlighting 'uncertain' segments' values (i.e. outliers) in red, e) 2024 segments identified as 'uncertain' (corresponding to tree cover loss) overlaid on the 2024 Sentinel-2 infrared composite, and f) 2024 land cover map including the validated tree cover loss polygons.

Source: Evaluation team

Assessment of FORVAC's impact on tree cover dynamics

Using the 2017 and 2024 land cover maps, we quantified tree cover change by calculating stable tree cover, stable non-tree cover, and tree cover loss for each village land forest reserve, along with the proportion of loss relative to 2017 tree cover. Comparisons were made with surrounding 5 km buffer zones, excluding overlaps with other village land forest reserves. To evaluate how distance from village land forest reserve boundaries influenced loss, we generated 500 m buffers up to 5 km (Figure 16) and applied Spearman's rank correlation, supported by median loss analysis across distances. All geostatistical analyses were conducted in R (R Core Team, 2024), and tree cover change maps were produced to visualise spatial dynamics.

Figure 16 Example of 500 m buffers used to estimate tree cover loss at increasing distances from village land forest reserves boundaries



Source: Evaluation team

Interactive map as a knowledge-sharing tool

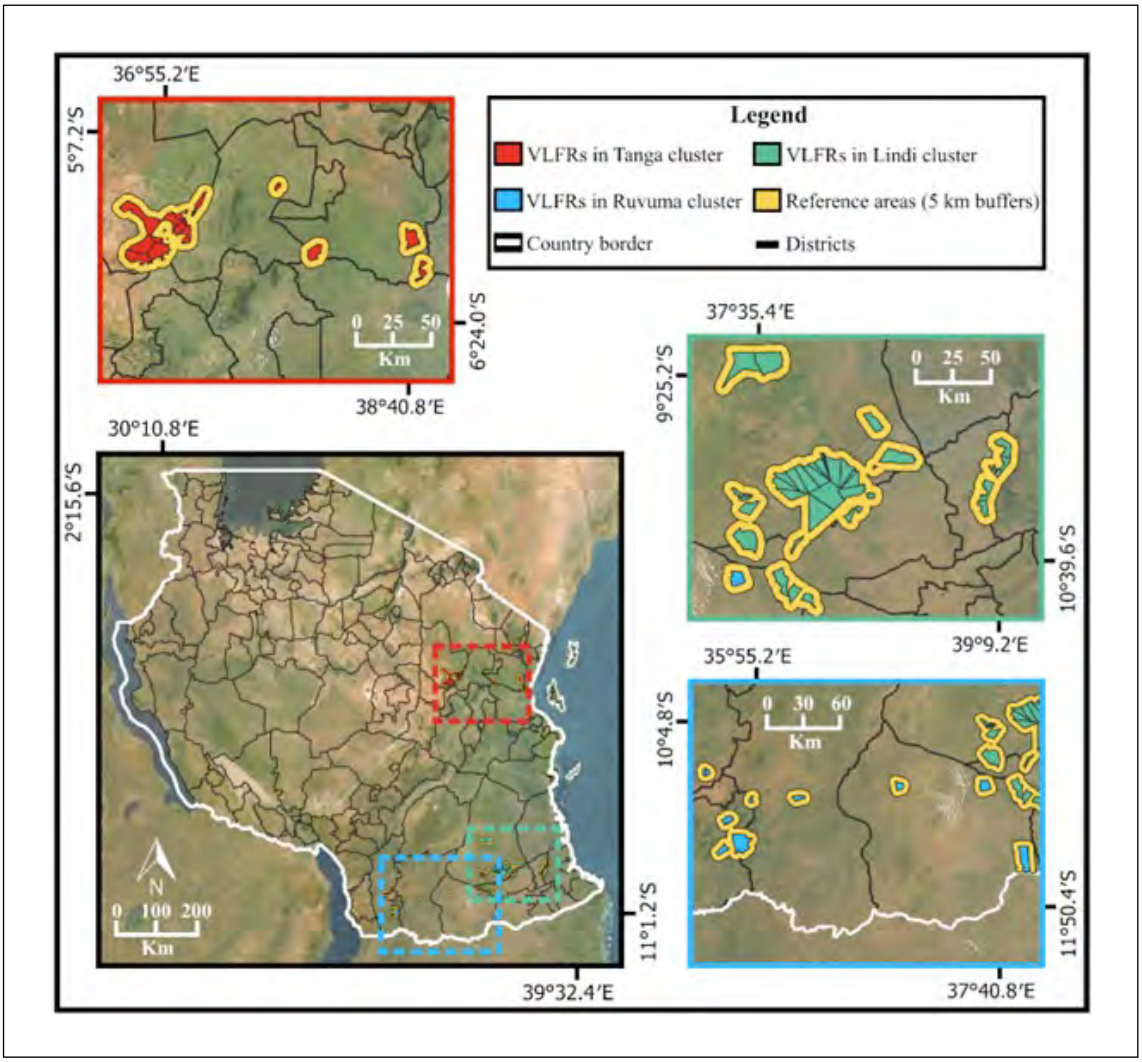
The geospatial expert developed an interactive web map to support the evaluation team. The map provided an intuitive and user-friendly interface that allowed the evaluation team to zoom in and out and explore the tree cover dynamics map generated for each village land forest reserve. By clicking on any village land forest reserve polygon, the team could access detailed information including the village land forest reserve's name, size, and the set of geostatistics estimated for each village land forest reserve and its corresponding reference area. This tool enabled the team to assimilate the insights from the analysis in a spatially explicit manner, easing the interpretation of the geospatial results.

Results

Village land forest reserves included in our assessment

Following the application of our multistep framework for cleaning and correcting the village land forest reserves spatial layers, a total of 67 village land forest reserves from 73 listed in FORVAC's list of supported villages were included in our geospatial analysis (Figure 17). Of them, 38 village land forest reserves were located in the Lindi cluster, spanning 260,678.26 ha, 10 were in Ruvuma, covering 57,604.84 ha, and 19 were situated in Tanga, summing 98,012.09 ha. The village land forest reserves varied widely in size, ranging from 60.13 ha (Chang'ombe, Suledo) to 22,081.53 ha (Aswamata (Suledo); Figure 18; Table 10). Together, the selected village land forest reserves cover a total area of 416,295.19 ha.

Figure 17 Geographic distribution of the village land forest reserves included in our analysis and their corresponding reference areas

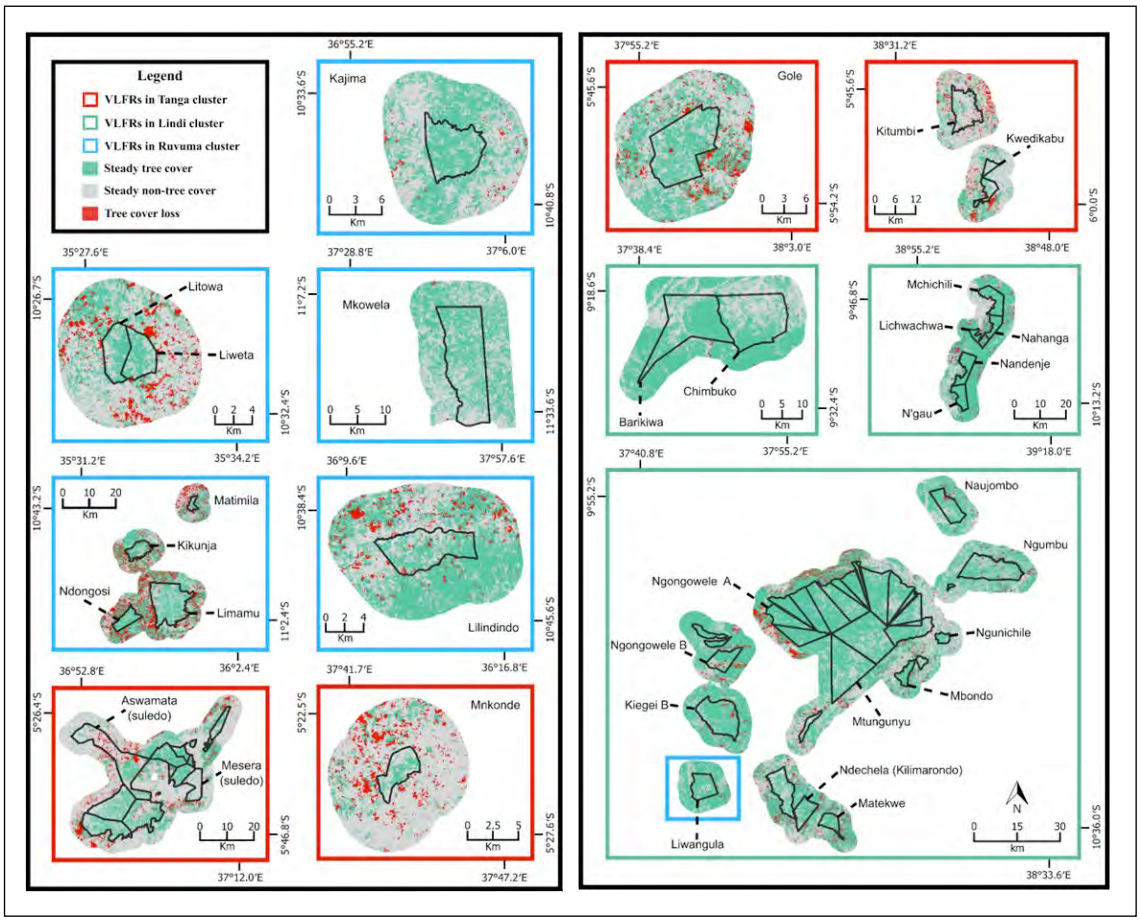


Source: Evaluation team

Tree cover dynamics within village land forest reserves

In 2017, tree cover within the village land forest reserves ranged from 16.83 ha in Chang'ombe (Suledo), the smallest, to 15,769.72 ha in the Nahoro, one to the largest reserves. These values represent 27.99% and 76.32% of their respective total areas (Figure 18; Table 10). The median tree-covered area across all village land forest reserves was 3,278.78 ha. In total, 286,810.49 ha were covered by trees in 2017, accounting for 68.89% of the total village land forest reserves area, which corresponded to 416,301.04 ha.

Figure 18 Tree cover dynamics 2017–2024 in the analysed village land forest reserves and their corresponding reference areas (5 km buffers)



Source: Evaluation team

Between 2017 and 2024, significant tree cover loss occurred primarily in the reference areas surrounding the village land forest reserves (Figure 18). In several instances, deforestation patches are visible immediately adjacent to the reserve boundaries but not within them, suggesting a barrier effect provided by these forest reserves. Sixteen village land forest reserves showed no tree cover loss during the study period (Figure 18 and Figure 19). Among the remaining 51 reserves, tree cover loss ranged from 0.07 ha in Ngongowele A to 931.84 ha in Aswamata (Suledo; Figure 18 and Figure 19; Table 10). The median area of tree cover loss across all reserves corresponded to 5.53 ha. In addition to Aswamata (Suledo), the reserve with the highest tree cover loss were: Limamu (234.94 ha), Olgira (Suledo; 159.73 ha), Kitumbi (154.68 ha), Kikunja (136.41 ha), and Ngongowele B (93.83 ha; Figure 18 and Figure 19; Table 10).

At the cluster level, Tanga experienced the highest total tree cover loss within its village land forest reserves, totalling 1,498.22 ha, followed by Lindi (531.48 ha) and Ruvuma (505.97 ha; Table 10). Notably, 25 of the 51 reserves that experienced deforestation lost less than 10 ha from their tree cover. The remaining 26 reserves, with substantially larger losses in multiple cases, represent outliers compared to the rest (Figure 19).

Between 2017 and 2024, the total deforested area across all village land forest reserves accounted for just 0.88% of their total tree cover in 2017 (Table 10). At the individual level, tree cover loss as a percentage of 2017 tree cover ranged from as little as 0.0013% in Ngongowele A to 17.64%

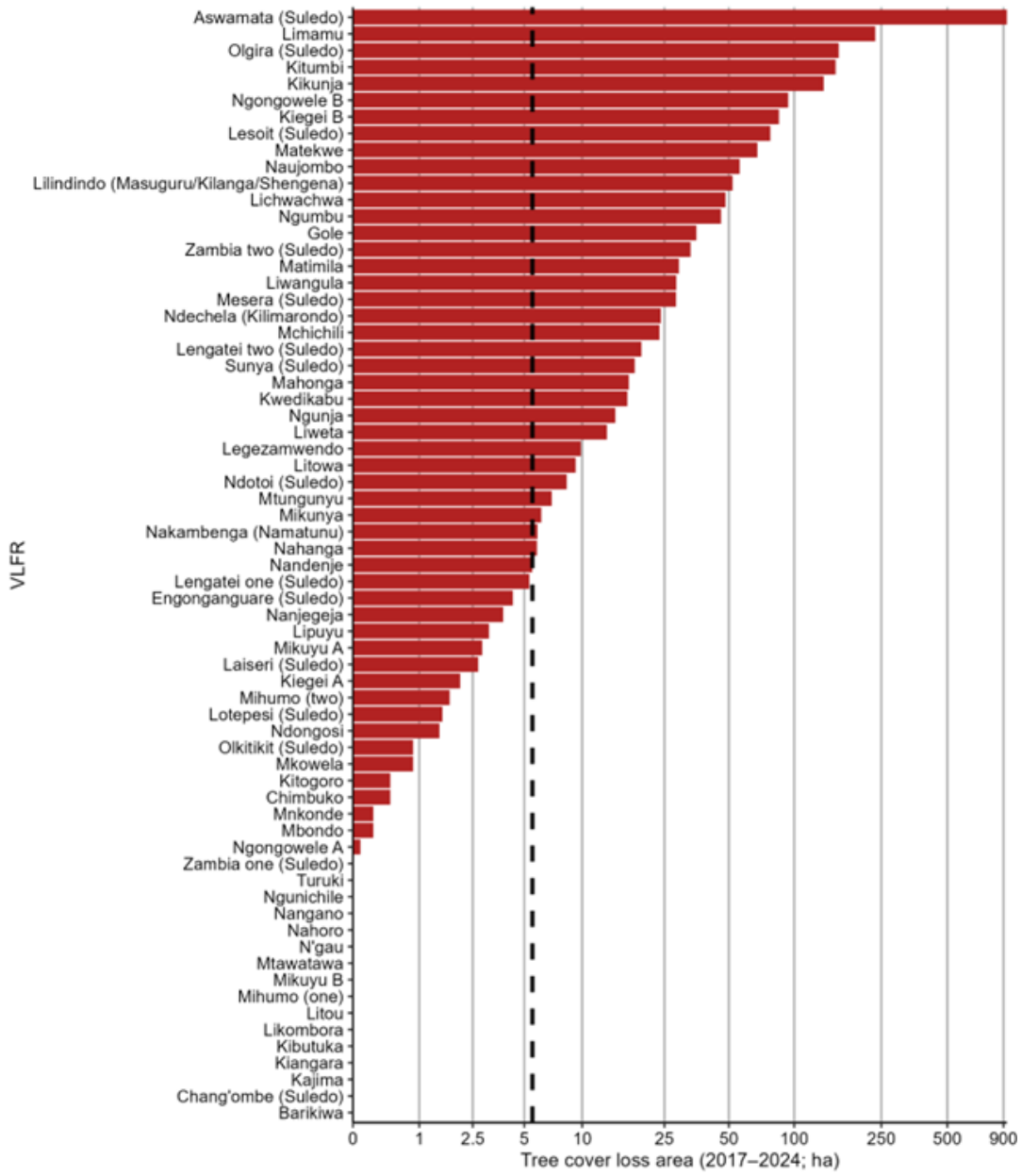
in Zambia Two (Suledo; Figure 20). The remaining reserves with the highest proportions of tree cover loss included Aswamata (Suledo; 11.42%), Laiseri (Suledo; 7.10%), Kitumbi (6.79%), Lengatei Two (Suledo; 5.72%), and Lesoit (Suledo; 5.51%). The median percentage of tree cover lost across all reserves was 0.20%. In total, 43 deforested reserves lost less than 3% of their 2017 tree cover, while the remaining 8 reserves with larger losses represent outliers in the sample (Figure 20; Table 10).

Tree cover loss compared to reference areas

The comparison of tree cover loss between the village land forest reserves and their reference areas reveals a strong contrast across these two spatial units (Figure 18 and Figure 21). In 2017, tree cover comprised about half of the area in all reference zones (54.06%), which was lower than the proportion observed in the reserves (68.89%). Overall, the reserves experienced significantly less deforestation from 2017 to 2024 (Figure 21), with the sole exception of Aswamata (Suledo), where the deforested area (931.84 ha) was nearly as large as that of its reference area (1,133.71 ha).

The difference in tree cover loss between the village land forest reserves and their reference areas ranged from 20.33 ha more deforested in the surroundings of Kibutuka to 3,677.68 ha around Limamu, with a median difference of 318.50 ha across all reserves (Figure 18 and Figure 21; Table 11). Following Limamu, the largest differences were observed in Ndongosi, which experienced 2,560.55 ha less deforestation compared to its reference area, followed by Ndotoi (Suledo; 1,889.95 ha), Ndotoi (Suledo; 1,253.65 ha), Gole (1,212.27 ha), and Ngongowele A (1,253.13 ha; Figure 18 and Figure 21; Table 11). The total deforested area across all reference areas amounts to 36,640.27 ha, accounting for 34,104.59 ha more than the combined deforestation in all reserves, which totalled 2,535.68 ha. Reserves with deforestation differences exceeding 1,253.13 ha compared to their reference areas were identified as outliers in our sample (Figure 21; Table 11).

Figure 19 Tree cover loss (ha) in each village land forest reserve

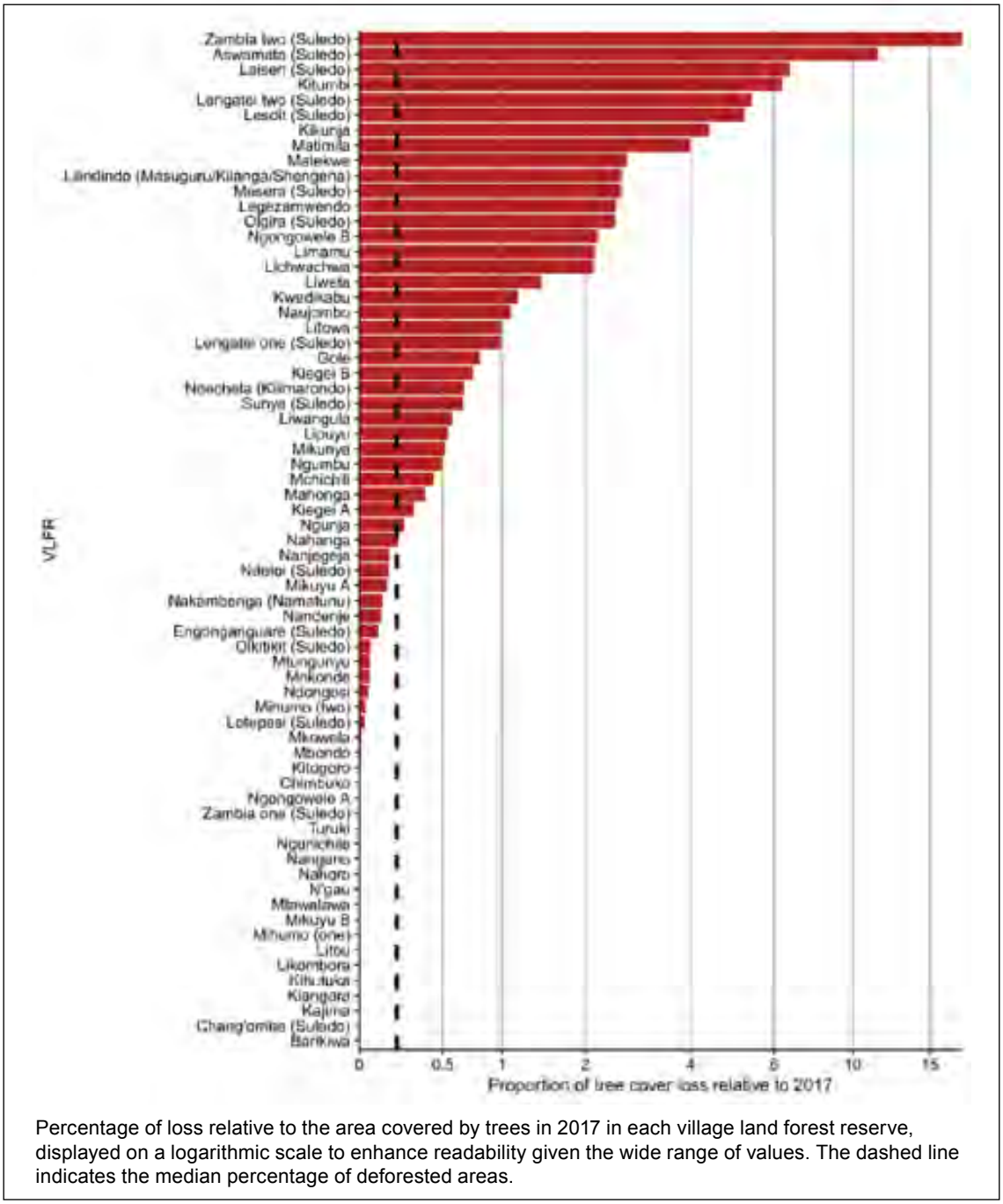


Tree cover loss (ha) in each village land forest reserve, displayed on a logarithmic scale to enhance readability given the wide range of values. The dashed line indicates the median deforested area

Source: Evaluation team

When comparing the proportion of tree cover loss relative to the total tree-covered area in 2017, most village land forest reserves show a smaller percentage of deforestation than their surrounding reference areas (Figure 18 and Figure 22; Table 11). Overall, reference areas lost 5.44% of their tree-covered area since 2017, while village land forest reserves experienced a much lower decrease of 0.88%, with median values of 4.45% and 0.20%, respectively (Table 11).

Figure 20 Percentage of loss relative to the area covered by trees in 2017 in each village land forest reserve



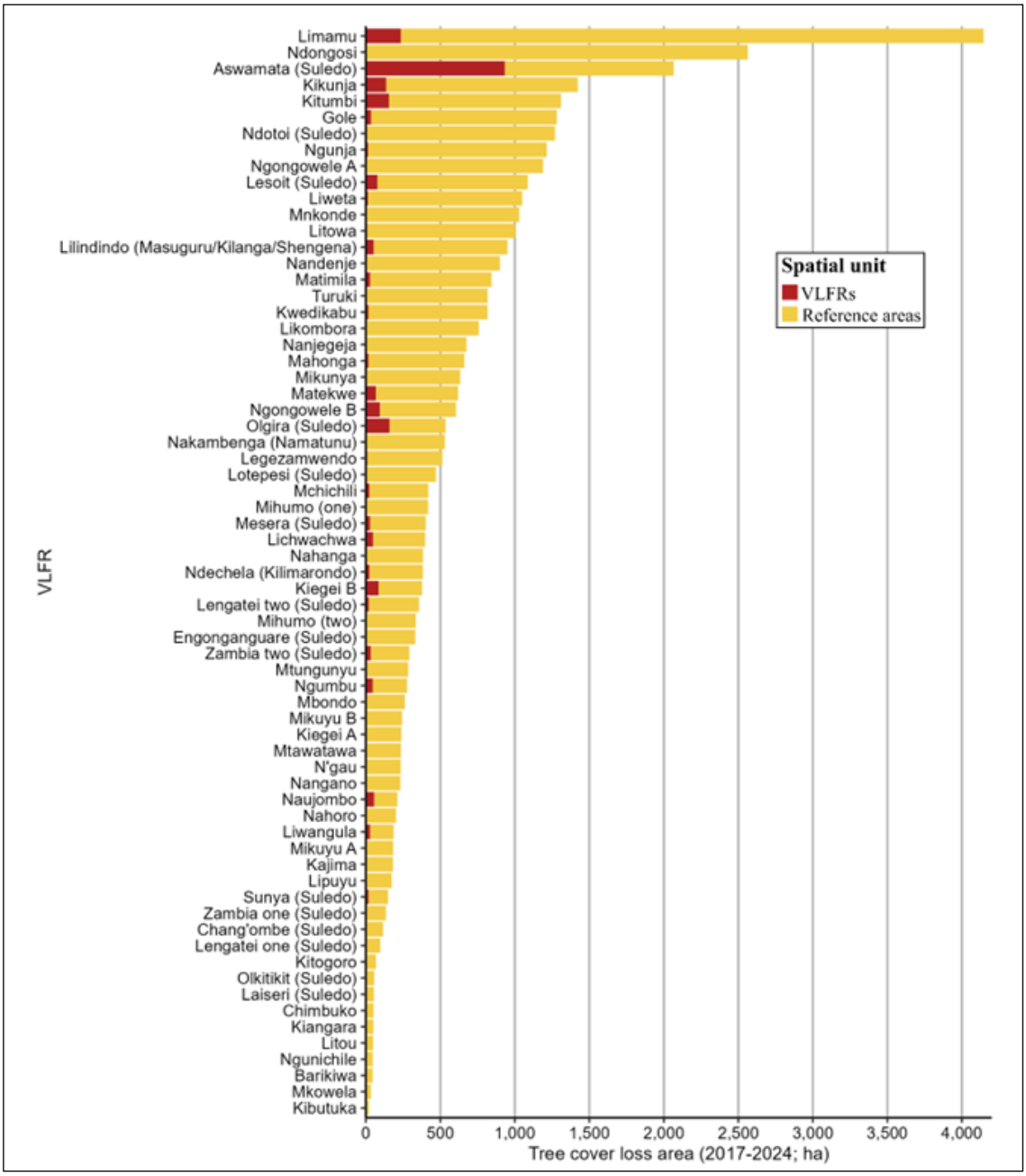
Percentage of loss relative to the area covered by trees in 2017 in each village land forest reserve, displayed on a logarithmic scale to enhance readability given the wide range of values. The dashed line indicates the median percentage of deforested areas.

Source: Evaluation team

The difference in proportional tree cover loss between the two spatial units ranges from -10.06%, where Zambia Two (Suledo) had a larger proportional decrease than its surrounding area, to 30.10%, representing a higher loss in the reference area of Mnkonde compared to its village land forest reserve boundary (Figure 22; Table 11). Beyond Mnkonde, the reference areas with the largest proportional tree cover declines compared to their corresponding reserves were Ndotoi (Suledo) with 24.16%, Lotepesi (Suledo) with 18.10%, Liweta with 17.92%, Ndongosi with 16.40%, and Litowa with 16.15%. Apart from Zambia Two (Suledo), Laiseri (Suledo), Aswamata (Suledo),

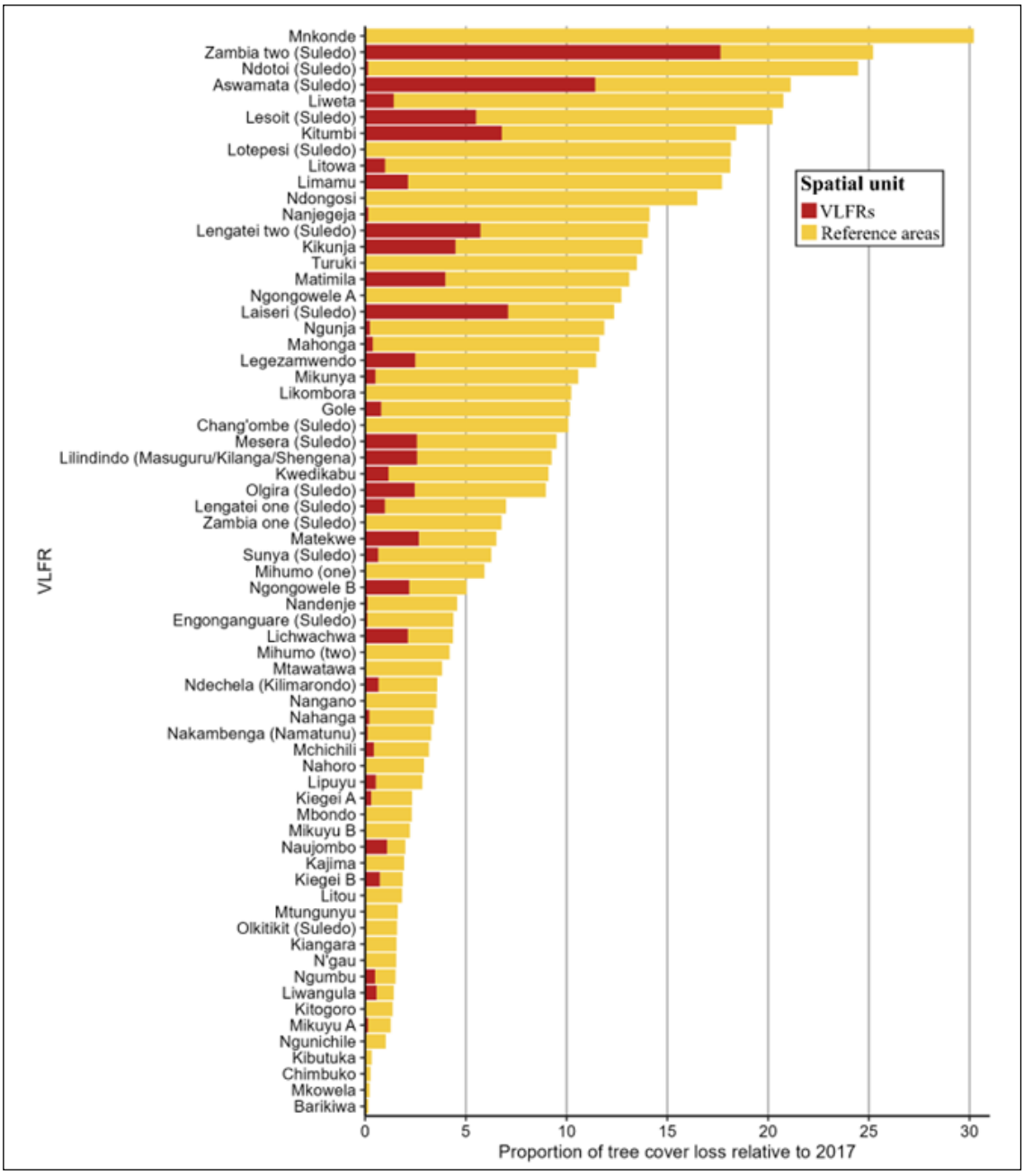
and Naujombo also experienced a larger proportional tree cover loss than their reference areas. Mnkonde and Ndotoi (Suledo) stand out as outliers in terms of the difference in tree cover loss relative to their reserves, while the remaining reserves exhibited difference values below 18.11% (Table 11).

Figure 21 Tree cover loss in each village land forest reserve and its reference area (ha)



Source: Evaluation team

Figure 22 Percentage of tree cover loss in each village land forest reserve and its reference area relative to their area covered by trees in 2017



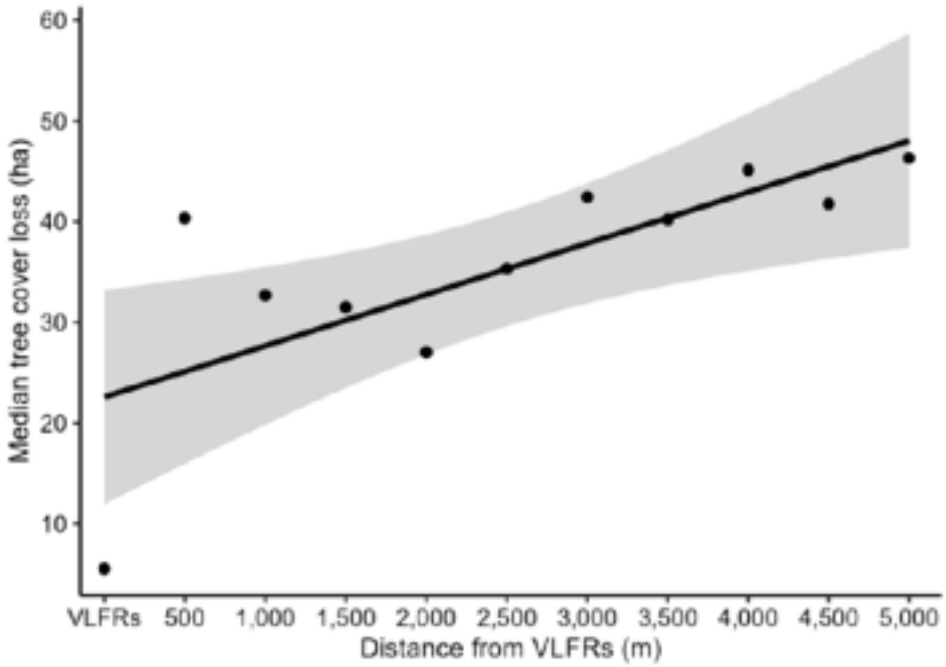
Source: Evaluation team

Relationship between tree cover loss and distance from village land forest reserves borders

The Spearman's rank correlation test revealed a statistically significant positive association between distance from village land forest reserves and tree cover loss ($\rho = 0.24$, $p < 0.001$). This suggests that tree cover loss tends to increase with greater distance from reserves boundaries, although the correlation is weak. While buffer distance alone does not fully explain deforestation patterns, it represents an important contributing factor to tree cover loss.

When examining median tree cover loss within reserves and at increasing distances from their borders, two distinct trends emerge. Inside the reserves, median tree cover loss is the lowest of the sample (5.53 ha). Moving outward, median tree cover loss sharply increases to 40.35 ha at 500 m but then gradually decreases to 27.01 ha at 2,000 m from the reserves boundaries. Beyond this distance, tree cover loss rises linearly, reaching 46.31 ha at 5,000 m (the largest median tree cover loss area of the sample; Figure 23). These patterns show that tree cover loss is concentrated near reserves borders but decreases at intermediate distances. The subsequent linear increase at greater distances may indicate broader landscape-level drivers of deforestation outside the immediate village land forest reserves influence.

Figure 23 Median tree cover loss (ha) within the village land forest reserves and across buffer zones at increasing distances from their borders



The black line represents a linear fit, with shaded grey areas indicating the 95% confidence intervals.

Source: Evaluation team

Limitations and considerations

This geospatial assessment provides valuable insights into the effectiveness of FORVAC-supported village land forest reserves in reducing deforestation, but it is subject to several methodological and data-related limitations that must be acknowledged. A key challenge was the inconsistency of the original reserve shapefiles. Many files contained missing or corrupted components, empty geometries, repeated polygons, topological errors, and naming discrepancies that complicated alignment with the official village land forest reserve list. Some polygons were either incomplete or missing and therefore excluded from the analysis. In other cases, shapefiles contained multiple non-adjacent polygons, which were retained, or contiguous segments, which were merged to represent unified reserves. While these corrections were guided by logical assumptions and cross-referenced with project documentation, they introduced some uncertainty regarding the accuracy and completeness of the final dataset. Ultimately, only 67 of the 73 reserves listed in FORVAC's final report could be confidently included, meaning our findings do not perfectly match the spatial extent reported by the project.

Outlook for future geospatial evaluations

Looking forward, this analysis exemplifies the potential of geospatial methods for project evaluation. Remote sensing offers powerful opportunities to track land use changes at high spatial and temporal detail, extending from historical baselines to future trend modelling. Yet, the quality of such assessments is only as strong as the base data. The discrepancies identified in this study illustrate the critical need for complete, standardised, and well-documented spatial datasets. Future projects would benefit from implementing clear metadata standards, file version control, consistent naming conventions, and quality assurance procedures to ensure spatial data is accurate, traceable, and suitable for long-term monitoring and evaluation. This would enable more transparent, reliable, and replicable geospatial assessments of conservation initiatives such as FORVAC.

Table 10 Total area, tree cover area in 2017, tree cover loss, and proportion of tree cover loss relative to 2017 in the analysed village land forest reserves

CLUSTER	VILLAGE LAND FOREST RESERVE	AREA (HA)	TREE COVER 2017 (HA)	TREE COVER LOSS (HA)	PROPORTION OF TREE COVER LOSS
Lindi	Barikiwa	19,025.48	14,419.53	0.00	0.00
Lindi	Chimbuko	18,914.70	10,324.54	0.48	0.00
Lindi	Kiangara	7,371.91	5,074.79	0.00	0.00
Lindi	Kibutuka	265.88	206.53	0.00	0.00
Lindi	Kiegei A	1,826.37	679.91	2.07	-0.30
Lindi	Kiegei B	13,855.11	11,560.17	85.16	-0.74
Lindi	Kitogoro	8,276.86	5,631.46	0.48	-0.01
Lindi	Legezamwendo	483.77	396.94	9.87	-2.49
Lindi	Lichwachwa	2,448.48	2,263.41	48.15	-2.13
Lindi	Likombora	10,842.52	9,340.81	0.00	0.00
Lindi	Lipuyu	1,082.02	582.50	3.14	-0.54
Lindi	Litou	1,809.42	1,218.99	0.00	0.00
Lindi	Mahonga	4,783.56	4,460.57	16.91	-0.38
Lindi	Matekwe	3,239.70	2,533.29	67.73	-2.67
Lindi	Mbondo	2,631.21	2,334.68	0.24	-0.01
Lindi	Mchichili	6,134.56	5,447.29	23.72	-0.44
Lindi	Mihumo (one)	8,693.65	8,045.25	0.00	0.00
Lindi	Mihumo (two)	5,398.63	5,248.05	1.75	-0.03
Lindi	Mikunya	1,369.38	1,195.76	6.17	-0.52
Lindi	Mikuyu A	2,187.80	1,998.95	2.87	-0.14
Lindi	Mikuyu B	1,379.22	1,345.86	0.00	0.00
Lindi	Mtawatawa	12,396.56	10,101.74	0.00	0.00
Lindi	Mtungunyu	19,002.84	13,550.13	7.00	-0.05
Lindi	Nahanga	3,065.08	2,806.80	5.85	-0.21
Lindi	Nahoro	20,663.40	15,769.73	0.00	0.00
Lindi	Nakambenga (Namatunu)	8,570.83	4,928.51	5.89	-0.12

CLUSTER	VILLAGE LAND FOREST RESERVE	AREA (HA)	TREE COVER 2017 (HA)	TREE COVER LOSS (HA)	PROPORTION OF TREE COVER LOSS
Lindi	Nandenje	5,078.50	4,998.62	5.53	-0.11
Lindi	Nangano	8,828.89	6,581.73	0.00	0.00
Lindi	Nanjegeja	2,638.76	2,405.88	3.82	-0.16
Lindi	Naujombo	6,738.54	5,146.61	56.15	-1.09
Lindi	Ndechela (Kilimarondo)	4,841.78	3,612.22	24.08	-0.67
Lindi	N'gau	4,053.96	4,018.11	0.00	0.00
Lindi	Ngongowele A	6,490.27	5,777.74	0.08	0.00
Lindi	Ngongowele B	5,472.20	4,284.65	93.83	-2.19
Lindi	Ngumbu	13,712.52	9,328.71	45.96	-0.49
Lindi	Ngunichile	1,469.05	1,134.75	0.00	0.00
Lindi	Ngunja	6,558.43	6,001.50	14.56	-0.24
Lindi	Turuki	9,076.47	7,242.50	0.00	0.00
Ruvuma	Kajima	3,495.69	2,561.63	0.00	0.00
Ruvuma	Kikunja	4,236.67	3,041.62	136.41	-4.48
Ruvuma	Lilindindo (Masuguru/ Kilanga/ Shengena)	3,338.87	2,015.90	52.01	-2.58
Ruvuma	Limamu	17,814.62	11,004.34	234.94	-2.13
Ruvuma	Litowa	1,422.48	934.79	9.27	-0.99
Ruvuma	Liwangula	6,292.61	5,004.11	28.45	-0.57
Ruvuma	Liweta	1,420.07	930.73	13.25	-1.42
Ruvuma	Matimila	1,200.96	735.46	29.29	-3.98
Ruvuma	Mkowela	14,215.72	8,235.07	0.88	-0.01
Ruvuma	Ndongosi	4,167.17	3,278.79	1.47	-0.04
Tanga	Aswamata (Suledo)	22,081.53	8,159.62	931.84	-11.42
Tanga	Chang'ombe (Suledo)	60.13	16.83	0.00	0.00
Tanga	Engonganguare (Suledo)	5,733.10	4,380.63	4.34	-0.10
Tanga	Gole	6,706.07	4,411.83	35.30	-0.80
Tanga	Kitumbi	7,881.64	2,278.50	154.68	-6.79
Tanga	Kwedikabu	3,467.19	1,429.22	16.63	-1.16
Tanga	Laiseri (Suledo)	191.61	38.12	2.71	-7.10
Tanga	Lengatei one (Suledo)	710.91	540.52	5.33	-0.99
Tanga	Lengatei two (Suledo)	397.86	339.36	19.42	-5.72
Tanga	Lesoit (Suledo)	2,976.83	1,409.76	77.64	-5.51
Tanga	Lotepesi (Suledo)	12,212.33	6,006.79	1.55	-0.03
Tanga	Mesera (Suledo)	5,567.73	1,103.08	28.37	-2.57

CLUSTER	VILLAGE LAND FOREST RESERVE	AREA (HA)	TREE COVER 2017 (HA)	TREE COVER LOSS (HA)	PROPORTION OF TREE COVER LOSS
Tanga	Mnkonde	1,077.56	463.83	0.24	-0.05
Tanga	Ndotoi (Suledo)	10,230.83	5,374.95	8.36	-0.16
Tanga	Olgira (Suledo)	11,862.69	6,483.08	159.73	-2.46
Tanga	Olkitikit (Suledo)	2,096.80	1,533.24	0.88	-0.06
Tanga	Sunya (Suledo)	4,047.58	2,754.51	18.07	-0.66
Tanga	Zambia one (Suledo)	438.34	157.10	0.00	0.00
Tanga	Zambia two (Suledo)	271.39	187.90	33.15	-17.64

Source: Evaluation team

Table 11 Tree cover loss areas and proportions relative to 2017, along with the absolute and proportional differences in tree cover loss between village land forest reserves and their reference areas

CLUSTER	VILLAGE LAND FOREST RESERVE	TREE COVER LOSS IN VILLAGE LAND FOREST RESERVES (HA)	TREE COVER LOSS IN REFERENCE AREAS (HA)	PROPORTION OF TREE COVER LOSS IN VILLAGE LAND FOREST RESERVES	PROPORTION OF TREE COVER LOSS IN REFERENCE AREAS	DIFFERENCE IN TREE COVER LOSS (REFERENCE AREA - VILLAGE LAND FOREST RESERVE; HA)	PROPORTIONAL DIFFERENCE IN TREE COVER LOSS (REFERENCE AREA - VILLAGE LAND FOREST RESERVE)
Lindi	Barikiwa	0.00	45.92	0.00	0.15	45.92	0.15
Lindi	Chimbuko	0.48	51.21	0.00	0.27	50.74	0.26
Lindi	Kiangara	0.00	50.38	0.00	1.56	50.38	1.56
Lindi	Kibutuka	0.00	20.33	0.00	0.33	20.33	0.33
Lindi	Kiegei A	2.07	236.57	0.30	2.03	234.50	1.72
Lindi	Kiegei B	85.16	292.24	0.74	1.13	207.09	0.39
Lindi	Kitogoro	0.48	67.69	0.01	1.36	67.21	1.35
Lindi	Legezamwendo	9.87	503.91	2.49	8.98	494.04	6.50
Lindi	Lichwachwa	48.15	350.02	2.13	2.23	301.87	0.10
Lindi	Likombora	0.00	757.87	0.00	10.23	757.87	10.23
Lindi	Lipuyu	3.14	169.88	0.54	2.30	166.73	1.76
Lindi	Litou	0.00	48.07	0.00	1.83	48.07	1.83
Lindi	Mahonga	16.91	643.74	0.38	11.25	626.83	10.87
Lindi	Matekwe	67.73	551.86	2.67	3.84	484.13	1.17
Lindi	Mbondo	0.24	262.12	0.01	2.30	261.88	2.29
Lindi	Mchichili	23.72	395.39	0.44	2.73	371.67	2.30
Lindi	Mihumo (one)	0.00	417.43	0.00	5.92	417.43	5.92
Lindi	Mihumo (two)	1.75	333.87	0.03	4.16	332.12	4.13
Lindi	Mikunya	6.17	626.63	0.52	10.06	620.46	9.55
Lindi	Mikuyu A	2.87	180.26	0.14	1.12	177.40	0.98
Lindi	Mikuyu B	0.00	242.86	0.00	2.22	242.86	2.22
Lindi	Mtawatawa	0.00	235.66	0.00	3.82	235.66	3.82
Lindi	Mtungunyu	7.00	277.32	0.05	1.57	270.32	1.52

CLUSTER	VILLAGE LAND FOREST RESERVE	TREE COVER LOSS IN VILLAGE LAND FOREST RESERVES (HA)	TREE COVER LOSS IN REFERENCE AREAS (HA)	PROPORTION OF TREE COVER LOSS IN VILLAGE LAND FOREST RESERVES	PROPORTION OF TREE COVER LOSS IN REFERENCE AREAS	DIFFERENCE IN TREE COVER LOSS (REFERENCE AREA - VILLAGE LAND FOREST RESERVE; HA)	PROPORTIONAL DIFFERENCE IN TREE COVER LOSS (REFERENCE AREA - VILLAGE LAND FOREST RESERVE)
Lindi	Nahanga	5.85	377.88	0.21	3.20	372.03	2.99
Lindi	Nahoro	0.00	203.15	0.00	2.92	203.15	2.92
Lindi	Nakambenga (Namatunu)	5.89	524.08	0.12	3.16	518.19	3.04
Lindi	Nandenje	5.53	894.52	0.11	4.46	888.99	4.35
Lindi	Nangano	0.00	231.48	0.00	3.55	231.48	3.55
Lindi	Nanjegeja	3.82	671.95	0.16	13.96	668.13	13.80
Lindi	Naujombo	56.15	155.59	1.09	0.90	99.44	-0.19
Lindi	Ndechela (Kilimarondo)	24.08	358.30	0.67	2.91	334.23	2.25
Lindi	N'gau	0.00	233.55	0.00	1.54	233.55	1.54
Lindi	Ngongowele A	0.08	1,189.59	0.00	12.72	1,189.51	12.72
Lindi	Ngongowele B	93.83	511.63	2.19	2.85	417.79	0.66
Lindi	Ngumbu	45.96	230.40	0.49	1.02	184.44	0.53
Lindi	Ngunichile	0.00	46.64	0.00	1.02	46.64	1.02
Lindi	Ngunja	14.56	1,199.58	0.24	11.63	1,185.01	11.39
Lindi	Turuki	0.00	817.16	0.00	13.49	817.16	13.49
Ruvuma	Kajima	0.00	181.70	0.00	1.94	181.70	1.94
Ruvuma	Kikunja	136.41	1,285.37	4.48	9.28	1,148.96	4.79
Ruvuma	Lilindindo (Masuguru/ Kilanga/Shengena)	52.01	898.86	2.58	6.68	846.85	4.10
Ruvuma	Limamu	234.94	3,910.83	2.13	15.57	3,675.89	13.44
Ruvuma	Litowa	9.27	993.68	0.99	17.13	984.41	16.14
Ruvuma	Liwangula	28.45	157.90	0.57	0.86	129.45	0.29
Ruvuma	Liweta	13.25	1,036.62	1.42	19.34	1,023.37	17.91
Ruvuma	Matimila	29.29	813.90	3.98	9.13	784.61	5.15

CLUSTER	VILLAGE LAND FOREST RESERVE	TREE COVER LOSS IN VILLAGE LAND FOREST RESERVES (HA)	TREE COVER LOSS IN REFERENCE AREAS (HA)	PROPORTION OF TREE COVER LOSS IN VILLAGE LAND FOREST RESERVES	PROPORTION OF TREE COVER LOSS IN REFERENCE AREAS	DIFFERENCE IN TREE COVER LOSS (REFERENCE AREA - VILLAGE LAND FOREST RESERVE; HA)	PROPORTIONAL DIFFERENCE IN TREE COVER LOSS (REFERENCE AREA - VILLAGE LAND FOREST RESERVE)
Ruvuma	Mkowela	0.88	34.10	0.01	0.21	33.23	0.20
Ruvuma	Ndongosi	1.47	2,562.03	0.04	16.44	2,560.55	16.40
Tanga	Aswamata (Suledo)	931.84	1,133.72	11.42	9.70	201.87	-1.72
Tanga	Chang'ombe (Suledo)	0.00	116.16	0.00	10.09	116.16	10.09
Tanga	Engonganguare (Suledo)	4.34	327.30	0.10	4.28	322.96	4.18
Tanga	Gole	35.30	1,246.33	0.80	9.37	1,211.04	8.57
Tanga	Kitumbi	154.68	1,155.13	6.79	11.62	1,000.45	4.84
Tanga	Kwedikabu	16.63	800.09	1.16	7.94	783.45	6.77
Tanga	Laiseri (Suledo)	2.71	51.73	7.10	5.26	49.03	-1.84
Tanga	Lengatei one (Suledo)	5.33	92.12	0.99	6.01	86.79	5.02
Tanga	Lengatei two (Suledo)	19.42	337.93	5.72	8.31	318.51	2.59
Tanga	Lesoit (Suledo)	77.64	1,009.24	5.51	14.71	931.61	9.20
Tanga	Lotepesi (Suledo)	1.55	468.89	0.03	18.13	467.33	18.10
Tanga	Mesera (Suledo)	28.37	373.62	2.57	6.93	345.25	4.36
Tanga	Mnkonde	0.24	1,029.02	0.05	30.16	1,028.78	30.11
Tanga	Ndotoi (Suledo)	8.36	1,261.49	0.16	24.31	1,253.14	24.16
Tanga	Olgira (Suledo)	159.73	375.73	2.46	6.51	216.00	4.05
Tanga	Olkitikit (Suledo)	0.88	55.11	0.06	1.52	54.24	1.47
Tanga	Sunya (Suledo)	18.07	131.04	0.66	5.60	112.97	4.95
Tanga	Zambia one (Suledo)	0.00	134.82	0.00	6.77	134.82	6.77
Tanga	Zambia two (Suledo)	33.15	259.10	17.64	7.58	225.95	-10.07

Source: Evaluation team

Annex 5: PFP geospatial analysis - methods and results

Objective

The objective of this geospatial analysis was to evaluate the effectiveness of plantation woodlots established through the Private Forest Programme (PFP) in Tanzania. Specifically, we aimed to determine whether plantation development has occurred within each designated woodlot area under the Tree-Growing Incentive Scheme from 2016, representing one year after the initial woodlot establishments, through to 2024, representing the most recent available data.

Datasets

For this assessment, we used GIS and remote sensing datasets from freely available sources. Spatial data delineating PFP plantation woodlots under Tree-Growing Incentive Scheme were obtained from the implementing team in Tanzania, comprising 8,894 polygons with metadata on woodlot and village identifiers, beneficiary gender, planting season, and tree genus (and in some cases species). To monitor woodlot development, we analysed 7,508 cloud-free Sentinel-2 images (10 m resolution) from ESA (2016–2024), processed in Google Earth Engine. Sentinel-2 was selected for its high spatial and temporal resolution suited to vegetation monitoring (Mas et al., 2016), with temporal coverage significantly improving after the 2017 launch of Sentinel-2B (Table 12).

Table 12 Number of Sentinel-2 scenes processed per year (2016–2024)

YEAR	NUMBER OF SCENES
2016	730
2017	635
2018	875
2019	879
2020	839
2021	945
2022	866
2023	860
2024	879
Total	**7,508**

Source: Evaluation team

Data preprocessing

The first step of our framework involved exploring, correcting, and cleaning the woodlot polygon datasets to ensure its suitability for subsequent analyses. During the data exploration, we identified and addressed several data quality issues, including overlapping polygons, topological errors, empty geometries, incorrect spatial locations, duplicated woodlot identifiers and plantation years, repeated polygons, and typographical errors or inconsistencies in attribute information. Table 13 provides a detailed overview of these issues and outlines the approach implemented to address each one.

Table 13 Issues identified in the woodlot data and how they were addressed

DATA ISSUE	DESCRIPTION	APPROACH TO ADDRESS IT
Overlapping polygons	A total of 1,298 woodlots, representing 14.43% of the dataset, were spatially overlapping with other woodlots. In some cases, the overlap covered more than 50% of the woodlot area, while in others, it was limited to smaller boundary sections. These overlaps could lead to overestimating the total planted area if they would have been quantified twice.	To avoid double counting the same area, we removed woodlot polygons that overlapped more than 10% of their surface with others. When choosing which polygons to keep, we prioritised retaining the larger of the overlapping woodlots.
Topological errors	A total of 143 woodlot polygons showed self-intersections. This is a topological issue where a polygon's boundary crosses over itself, causing it to split into separate parts. These errors can prevent accurate spatial analysis.	We manually corrected all self-intersecting polygons using QGIS, ensuring each polygon became a valid, continuous shape.
Empty geometries	One woodlot entry had attribute information in the table but no associated geometry, meaning it lacked a spatial polygon to represent it on the map.	Since no spatial data was available for this feature, we removed the record from the dataset.
Incorrect spatial locations	Three woodlot polygons were found in incorrect locations, positioned out of Tanzania, far from their expected geographic area. This error was likely caused by an incorrect coordinate reference system or projection being applied to the data during PFP.	These polygons were removed from the dataset because their correct geographic location could not be determined.
Duplicated woodlot identifiers and plantation years	Multiple woodlots shared the same identifier and plantation year on the attribute table. These cases fell into three categories: (1) highly overlapping polygons with identical attributes; (2) separate polygons in different locations but with the same attributes; (3) adjacent polygons with the same attributes.	We generated a unique identifier for each woodlot by combining the original identifier with its plantation year. For each specific case we: (1) removed the smallest of the two highly overlapping polygons with the same attributes; (2) added "2" at the end of the new identifier of one of them to distinguish them; (3) merged the two adjacent polygons into one.
Repeated polygons	Two polygons appeared twice in the dataset with different woodlot identifiers and unique identifiers but were actually the same polygon duplicated.	We removed one of the two duplicated polygons to prevent double counting.

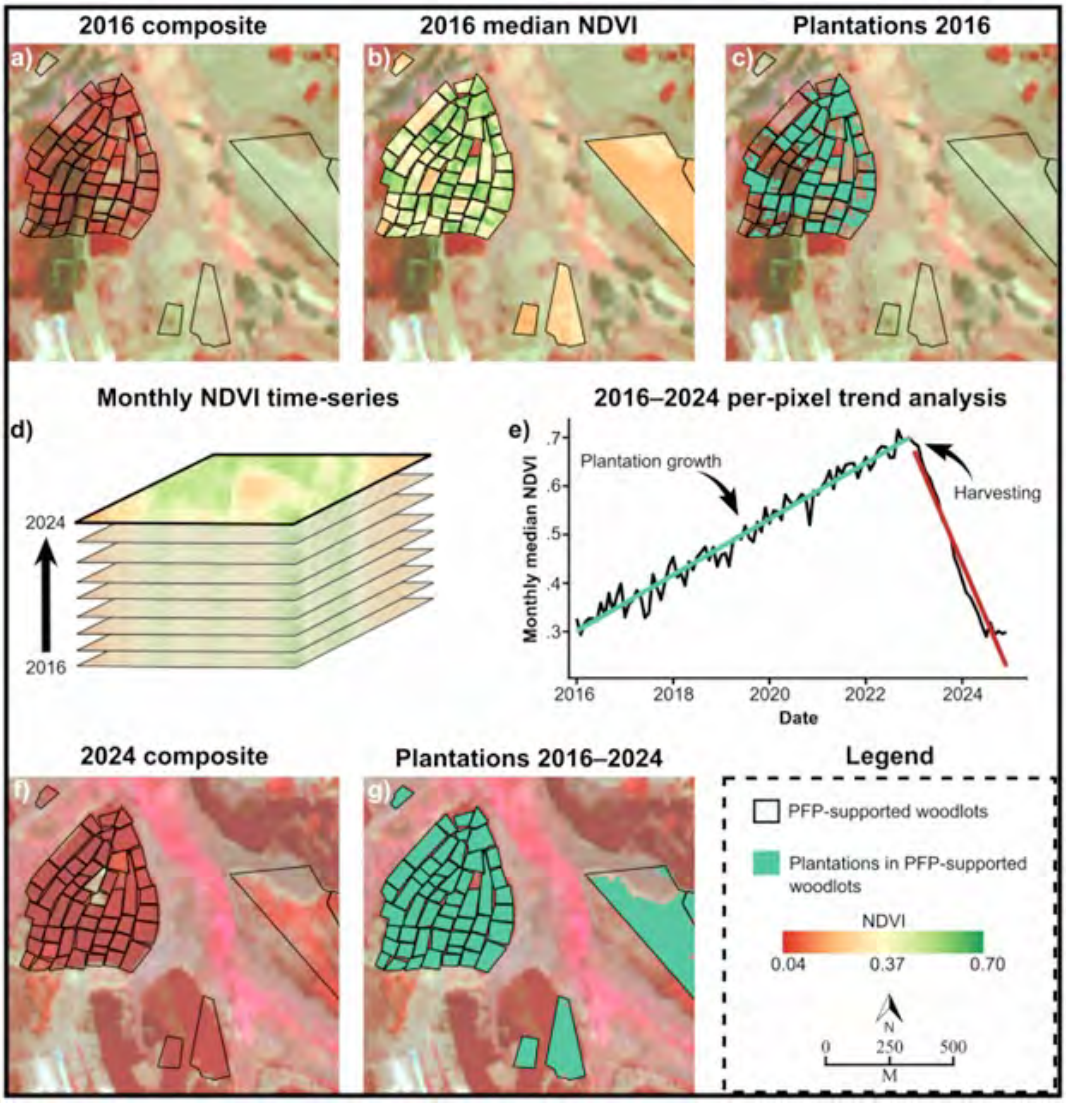
DATA ISSUE	DESCRIPTION	APPROACH TO ADDRESS IT
Typographical errors or inconsistencies in attribute information	Several attributes contained typos or inconsistent formatting, such as irregular use of uppercase and lowercase. These issues were found in fields like village names, gender of the beneficiary, tree species genus, and planting season.	We corrected all identified typos and standardised the formatting of text across all woodlot polygons to ensure consistency in the dataset.

Source: Evaluation team

Identification of plantations within woodlots

To assess plantation development in PFP woodlots, we generated annual cloud-free Sentinel-2 infrared composites from 2016 to 2024 at 10 m resolution using Google Earth Engine (Figure 24a) and supplemented these with very high-resolution Google Earth imagery for visual verification. Plantation presence was detected using the Normalized Difference Vegetation Index, which quantifies vegetation presence and greenness (Tucker, 1979; Yengoh et al., 2015; Huang et al., 2021). For the 2016 baseline, median annual Normalized Difference Vegetation Index values were computed per pixel (Figure 24b), and a threshold of 0.45 was applied to classify existing plantations established between 2014 and 2015 (Figure 24).

Figure 24 Steps conducted to identify plantations within PFP-supported woodlots from 2016 to 2024



a) 2016 Sentinel-2 infrared composite, b) 2016 median Normalized Difference Vegetation Index used to identify plantations at the start of the assessment period, c) plantations identified within PFP-supported woodlots in 2016, d) 2016–2024 monthly Normalized Difference Vegetation Index time-series, e) 2016–2024 piecewise trend analysis showing plantation growth and harvesting for one pixel, f) 2024 Sentinel-2 infrared composite, and g) plantations identified within PFP-supported woodlots between 2016 and 2024.

Source: Evaluation team

Since plantations such as eucalyptus are highly dynamic and can be harvested within 4–5 years, relying on static 2016 and 2024 comparisons could miss interim growth. To capture the full temporal plantation development, we produced monthly median Normalized Difference Vegetation Index composites (Figure 24d) and generated per-pixel time series from 2016 until 2024 using all available Sentinel-2 images (Table 12). Piecewise linear regressions were applied to each pixel's Normalized Difference Vegetation Index series (Figure 24e) to detect multiple trends, including positive slopes indicating plantation growth and negative slopes reflecting harvesting. Pixels with statistically significant positive trends ($p \leq 0.05$) and slopes ≥0.2 Normalized Difference Vegetation Index units were classified as new plantations, with validation through visual inspection of multi-temporal composites (Figure 24f).

Finally, newly detected plantation pixels were integrated with the 2016 baseline to produce a comprehensive spatial layer of plantation presence across 2016–2024 for all woodlots (Figure 24g). Normalized Difference Vegetation Index time-series processing was conducted in Google Earth Engine, and regression analyses were performed in R (R Core Team, 2024), ensuring robust detection of plantation establishment, growth, and harvesting dynamics.

Assessment of the effectiveness of plantation development within PFP-supported woodlots

Using the spatial layer representing plantations developed between 2016 and 2024, alongside the cleaned data representing the woodlots supported by PFP, we applied geospatial statistical methods to evaluate the effectiveness of plantation development. We began by calculating general summary statistics, including the total number of woodlots, the overall area designated as woodlots, the area where plantations had been established, and the proportion of woodlot area planted.

To generate more granular insights, we disaggregated these indicators by district, incorporating additional variables such as the number of associated villages and the gender of beneficiaries. We also examined woodlot characteristics by year of establishment to identify potential temporal trends. Further, we assessed plantation development by village, gender, and species genus, considering indicators such as the number of woodlots, total woodlot area, area planted, and the proportion of the woodlot area covered by plantations.

These metrics enabled us to frame a detailed spatial and temporal evaluation of plantation effectiveness across different indicators and spatial units within the PFP-supported areas in Tanzania. All statistical analyses were conducted using the environment for statistical computing R (R Core Team, 2024).

Interactive map as a knowledge-sharing tool

The geospatial expert developed an interactive web map to support the evaluation team. The map provided an intuitive and user-friendly interface that allowed the evaluation team to zoom in and out and explore the plantations map generated for each woodlot. By clicking on any woodlot polygon, the team could access detailed information including the region, district and village associated to it, establishment date, beneficiary gender, species genus, woodlot area, planted surface, and proportion planted. This tool enabled the team to assimilate the insights from the analysis in a spatially explicit manner, easing the interpretation of the geospatial results.

Results

PFP-supported woodlots included in our assessment

Following the application of our multistep framework for cleaning and correcting the PFP spatial layers, a total of 8,809 woodlot polygons were included in our geospatial analysis (Table 14; Figure 25). This corresponds to 85 fewer woodlots than the original dataset of 8,894 polygons

provided. The validated woodlots collectively span 8,371.62 ha and are associated to 65 villages in the districts of Kilolo, Ludewa, Makete, Mbinga, Mufindi, Njombe, Njombe Rural, Nyasa, and Songea (Figure 25; Table 13).

Of the assessed woodlots, 5,993 (68.03%) are registered under male beneficiaries and 2,492 (28.29%) under female beneficiaries. Including institutional beneficiaries and woodlots without a beneficiary name, the total number of individuals and institutions benefiting under the Tree-Growing Incentive Scheme amounts to 7,930. According to the filtered PFP data, the number of supported woodlots increased over time, with 631 woodlots established between 2014–2015 (7.16%), 861 between 2015–2016 (9.77%), 3,546 between 2016–2017 (40.25%), and 3,771 between 2017–2018 (42.80%), indicating a significant scale-up in later years of the program (Table 14).

Table 14 Summary of woodlots included in our assessment by district

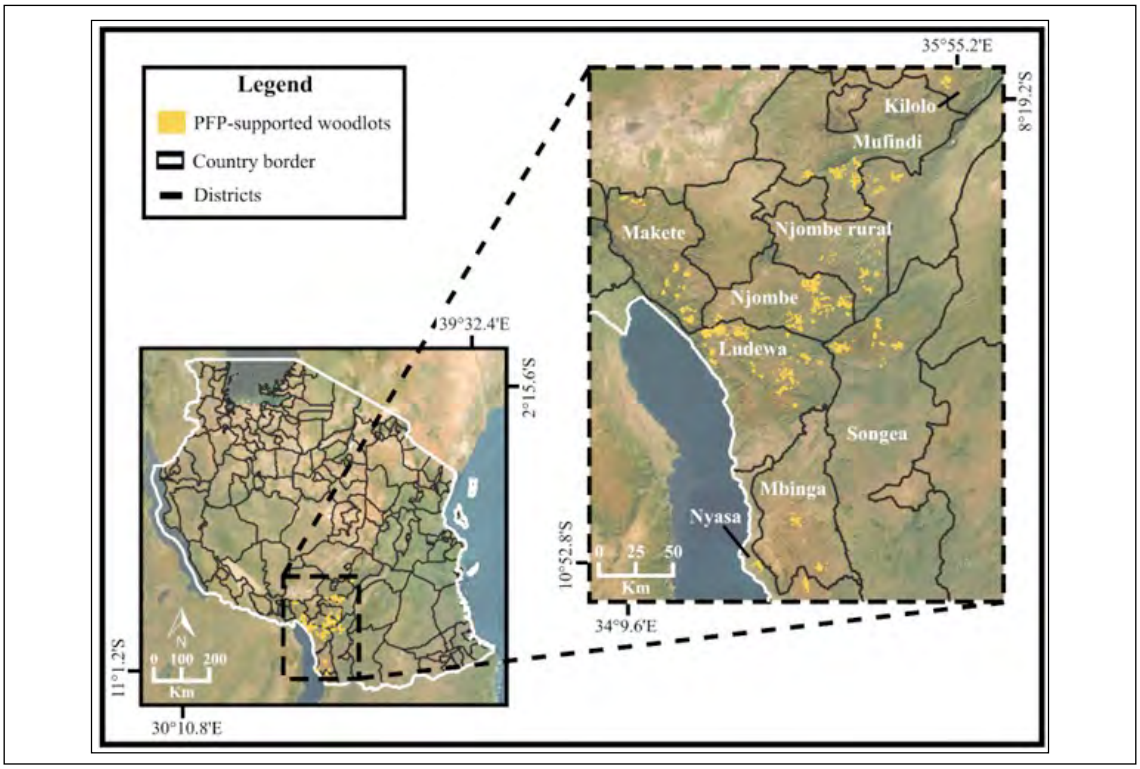
			BENEFICIARY GENDER*		
DISTRICT	NUMBER OF VILLAGES	NUMBER OF WOODLOTS	FEMALE	MALE	TOTAL WOODLOT AREA (HA)
Kilolo	1	234	78	142	258.47
Njombe Rural	6	307	82	217	338.03
Mbinga	6	785	203	566	381.77
Kilombero	3	192	78	106	438.45
Nyasa	8	935	290	640	528.06
Mufindi	7	620	169	435	663.97
Songea	6	906	260	624	719.47
Njombe	6	650	174	431	1,427.24
Makete	14	1,909	448	1,382	1,547.40
Ludewa	13	2,271	710	1,450	2,068.72
Total	**65**	**8,809**	**2,492**	**5,993**	**8,371.62**

Summary of woodlots included in our assessment aggregated by district, showing the number of villages with PFP-supported woodlots, the total number of woodlots, the number of woodlots registered under male and female beneficiaries, and the total woodlot area per district. The rows are ordered by total woodlot area.

*Woodlots with unspecified beneficiary gender are not included in the calculation.

Source: Evaluation team

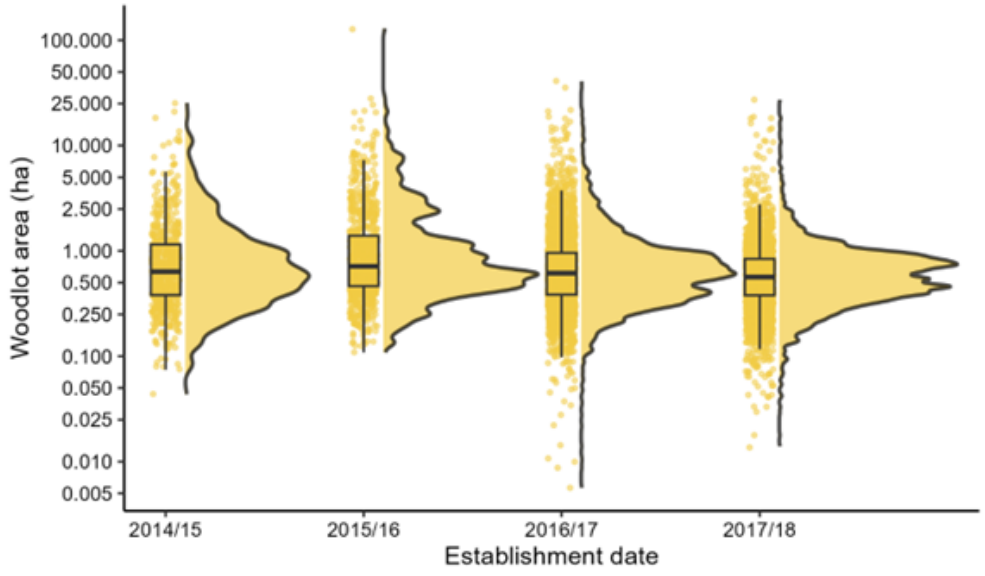
Figure 25 Geographic distribution of the PFP-supported woodlots included in our analysis



Source: Evaluation team

Overall, the size of established woodlots ranged from 0.005 ha to 129.48 ha, with the largest one, established during the 2015–2016 period, standing out as a significant outlier in the dataset (Figure 26). Across all establishment periods, the median woodlot size was approximately 0.75 ha. Notably, during the 2016–2017 and 2017–2018 periods, a larger number of smaller woodlots were established compared to earlier periods (Figure 26).

Figure 26 Distribution of woodlot sizes (ha) by establishment date



* Presented on a logarithmic scale to improve readability and effectively represent the wide variation in area values

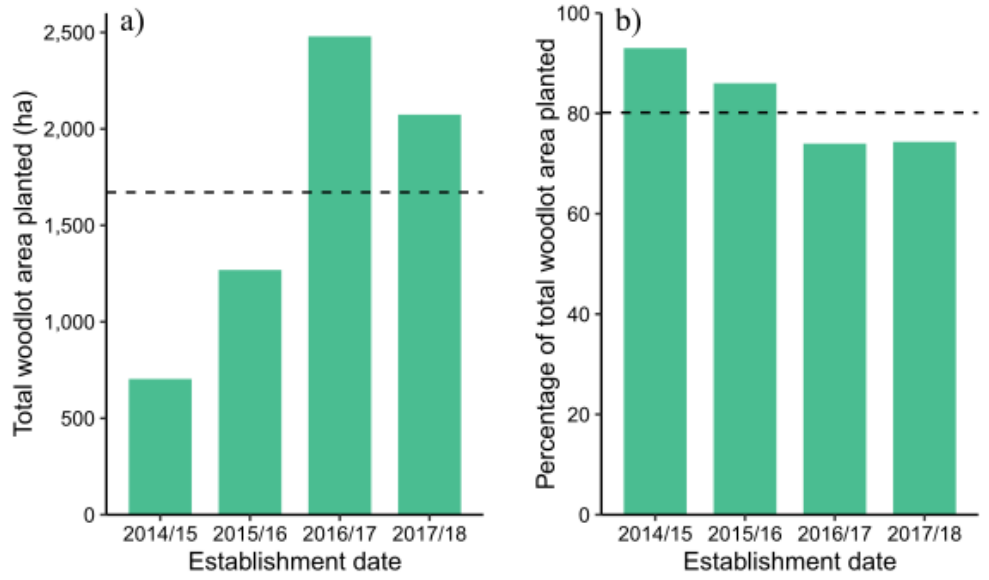
Source: Evaluation team

Plantations developed within PFP-supported woodlots between 2016 and 2024

Of the total 8,731.62 ha covered by woodlots established with PFP support between 2015 and 2018, approximately 6,525.38 ha, representing 77.94% of the total woodlot area, have been planted between 2016 and 2024. The total planted area increased over time as more woodlots were established (Table 14), rising from 703.76 ha among woodlots supported in 2014–2015 to a peak of 2,479.25 ha for those established in 2016–2017 (Figure 27). A decline followed in 2017–2018, with a lower number of established woodlots compared to the previous period, totalling 2,073.83 ha of planted area (Figure 27; Table 14).

However, when examining the proportion of planted areas relative to the total woodlot area by establishment period, an inverse pattern to the trend in total planted areas emerges (Figure 27; Table 14). Woodlots established between 2014 and 2015 exhibited the highest proportion of planted area, with 93.02% of their total area covered by plantations. This proportion declines in woodlots established in subsequent periods, dropping to 86.02% for those from 2015–2016 and further to 73.99% for the ones established in 2016–2017. In woodlots established in the 2017–2018 period, a slight increase was observed, with 74.34% of their total area planted (Figure 27; Table 14). Overall, this indicates that plantation development has been more effective in woodlots established in earlier periods compared to those established more recently.

Figure 27 Total woodlot area planted by establishment date



Total woodlot area planted (a) and percentage of the total woodlot area planted (b) by establishment date. The dashed line indicates the median value of each plot.

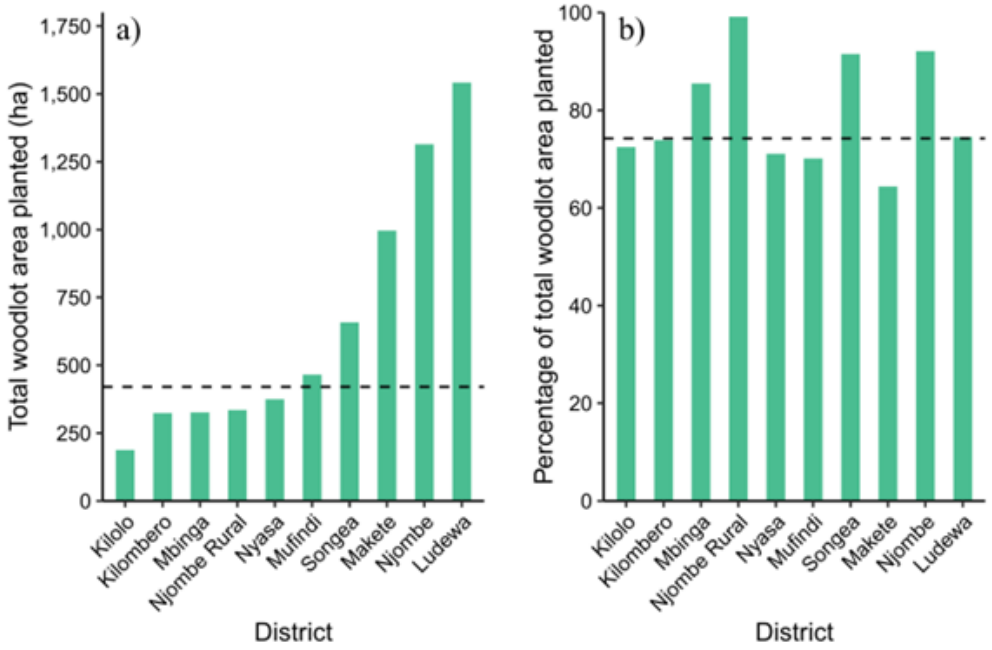
Source: Evaluation team

When aggregated by district, notable differences emerge between the total woodlot area and the proportion of that area that has been planted (Figure 28; Table 15). Districts such as Kilolo, Kilombero, Mbinga, Njombe Rural, and Nyasa exhibit small total planted areas, all falling below the median across districts. In contrast, Ludewa, Njombe, Makete, and Songea stand out with the largest planted areas within their respective woodlots. These results highlight that the extent of planting does not necessarily correspond to the total woodlot area. For instance, Kilombero, despite

having a larger total woodlot area compared to Mbinga and Njombe, shows a comparatively lower total planted area. Similarly, Njombe, with a smaller total woodlot area than Makete, surpasses it in terms of planted area (Figure 28; Table 15).

The percentage of total woodlot area that has been planted indicates that the effectiveness of plantation development varied considerably across districts. The highest planting effectiveness was observed in Njombe Rural, where 99.14% of the total woodlot area has been covered by plantations (Figure 28; Table 15). This district was followed by Njombe with 92.11%, Songea with 91.52%, and Mbinga with 85.47%, all showing high efficiency in developing plantations within PFP-supported woodlot areas. In contrast, woodlots in Makete showed plantations established on only 64.40% of their total area. Additionally, the districts of Ludewa, Kilombero, Kilolo, Nyasa, and Mufindi each recorded less than 75% of their woodlot area being planted during the assessment period (Figure 28; Table 15).

Figure 28 Total woodlot area planted by district



Total woodlot area planted (a) and percentage of the total woodlot area planted (b) by district. The districts in in both plots follow the order from a) for comparability. The dashed line indicates the median value of each plot.

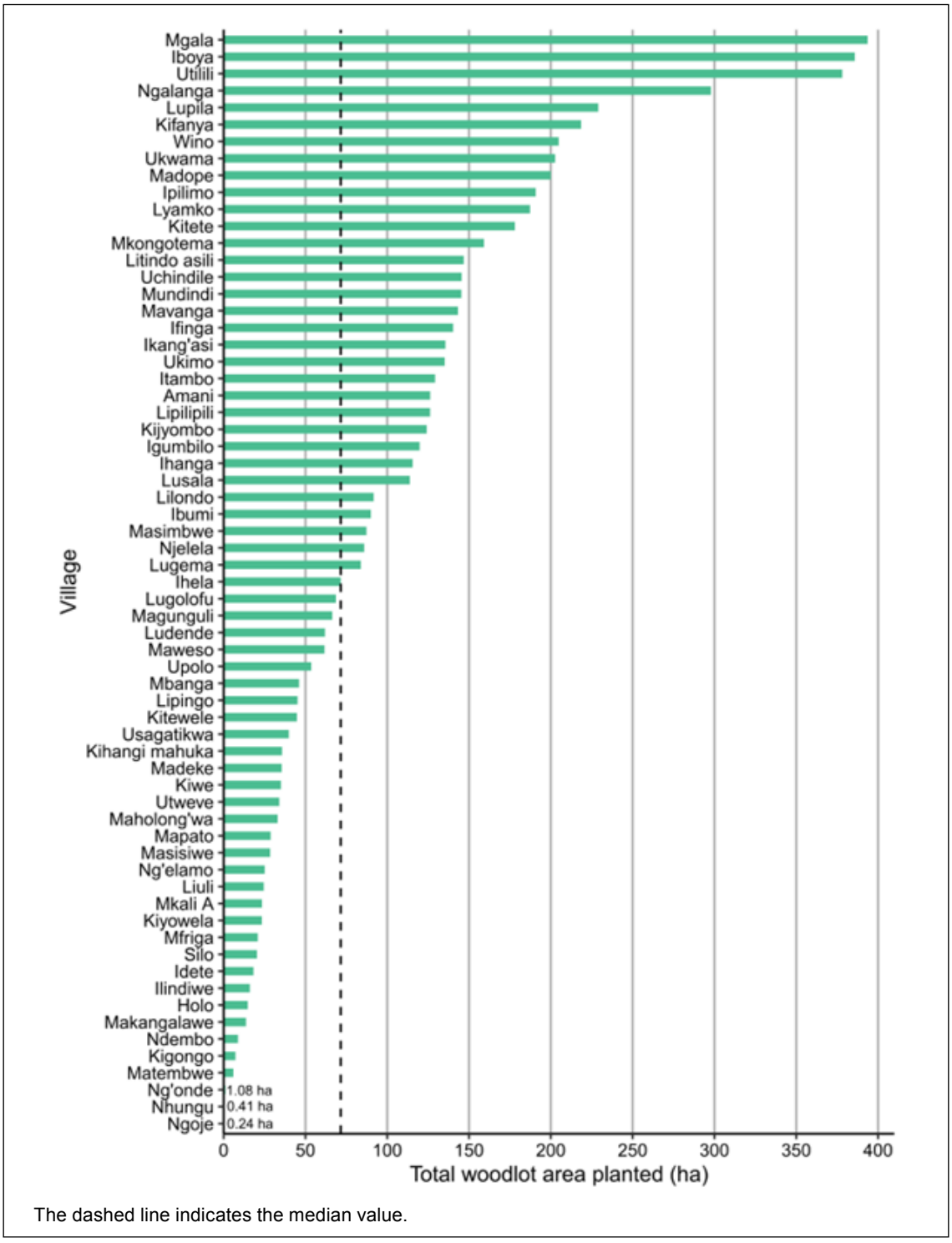
Source: Evaluation team

Villages associated with PFP-supported woodlots display a broad range of total planted areas, spanning from less than half a ha to nearly 400 ha (Figure 29; Table 17). At the lower end of the ranking are villages such as Ngoje (0.24 ha), Nhungu (0.41 ha), Ng'onde (1.08 ha), and Matembwe (5.91 ha), where small plantation development surfaces have been developed. Interestingly, some villages with smaller total woodlot areas exhibit larger plantation surface areas. For instance, Kigongo (13.14 ha), Ndembo (19.61 ha), and Ilindiwe (29.45 ha) show larger total woodlot areas, but exhibited smaller planted surfaces between 2016 and 2024. On the other end, the villages of Mgala (393.65 ha), Iboya (385.86 ha), Utilili (378.18 ha), and Ngalanga (297.88 ha) stand out for showing the largest total planted areas. These villages account for the largest woodlot

developments overall, both in terms of total area and planted extent between 2016 and 2024 (Figure 29; Table 17).

When evaluating the effectiveness of plantation development across villages measured as the percentage of woodlot area covered by plantations, the ranking of villages shifts significantly compared to the ranking based on total planted surface area (Figures 6 and 7). For instance, Ikang'asi, which ranks 19th in terms of total planted area, showed the highest plantation success, with 100% of its woodlot surface planted between 2016 and 2024 (Figure 30; Table 17). Similarly, Matembwe, despite having the fourth smallest total planted area (Figure 29), ranked second in terms of percentage, with 99.96% of its woodlot area covered by plantations. Itambo follows closely with 99.95% of its woodlot area planted, despite being ranked 21st in total woodlot area. These examples show that planting efficiency is not always directly associated with the overall woodlot area. In contrast, villages with the smallest total woodlot areas, such as Ngoje, Nhungu, and Ng'onde, not only had limited woodlot surfaces (Figure 29), but also showed the lowest proportions of area planted (Figure 30) reinforcing the correlation between absolute and relative plantation underdevelopment in these cases. Overall, only 12 villages, accounting for 18.46% of all, had less than 50% of their woodlot area covered by plantations. In contrast, 37 villages, representing 56.92% of the total, exhibited more than 80% of their woodlot area successfully planted.

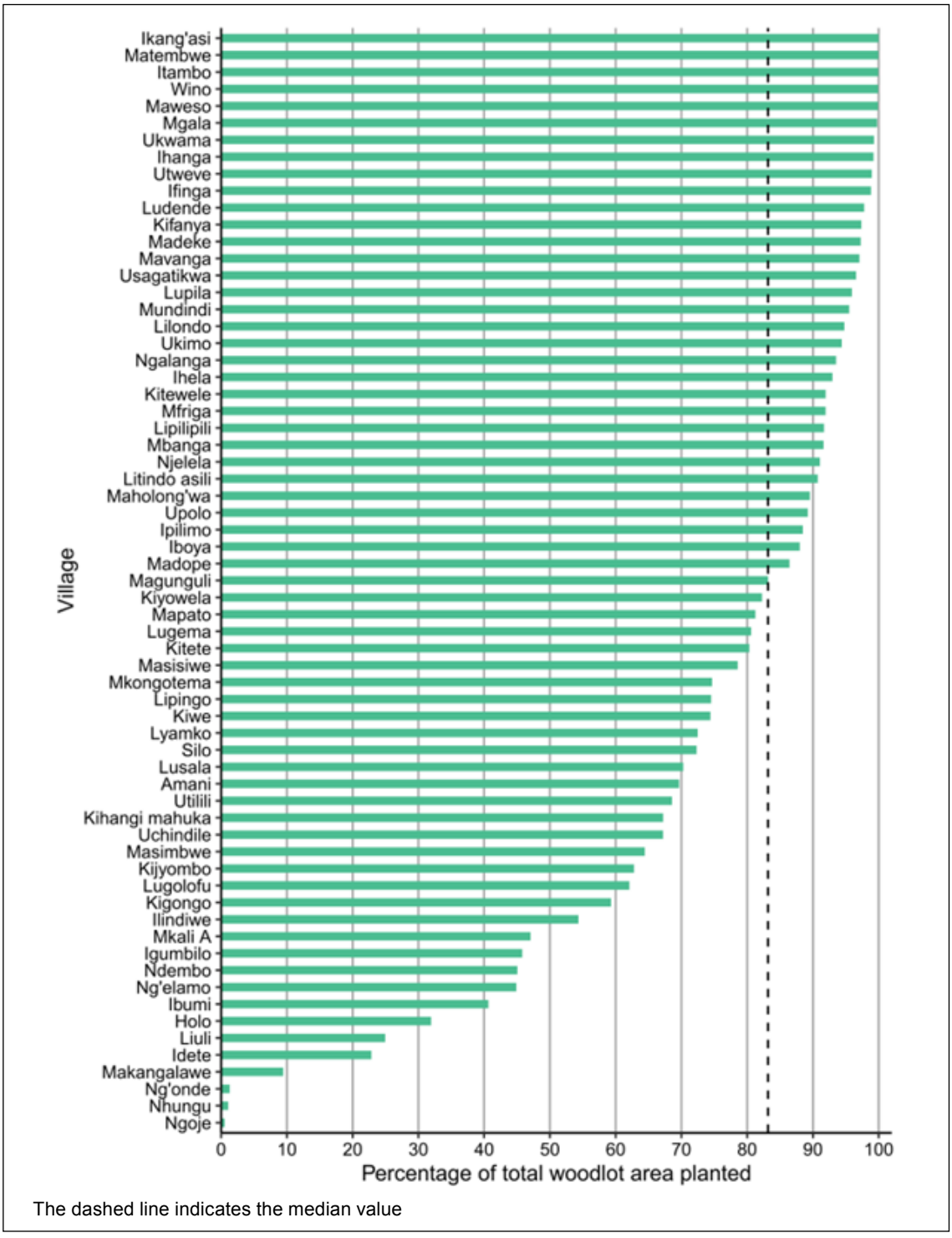
Figure 29 Total woodlot area planted by village



The dashed line indicates the median value.

Source: Evaluation team

Figure 30 Percentage of the total woodlot area planted by village



The dashed line indicates the median value

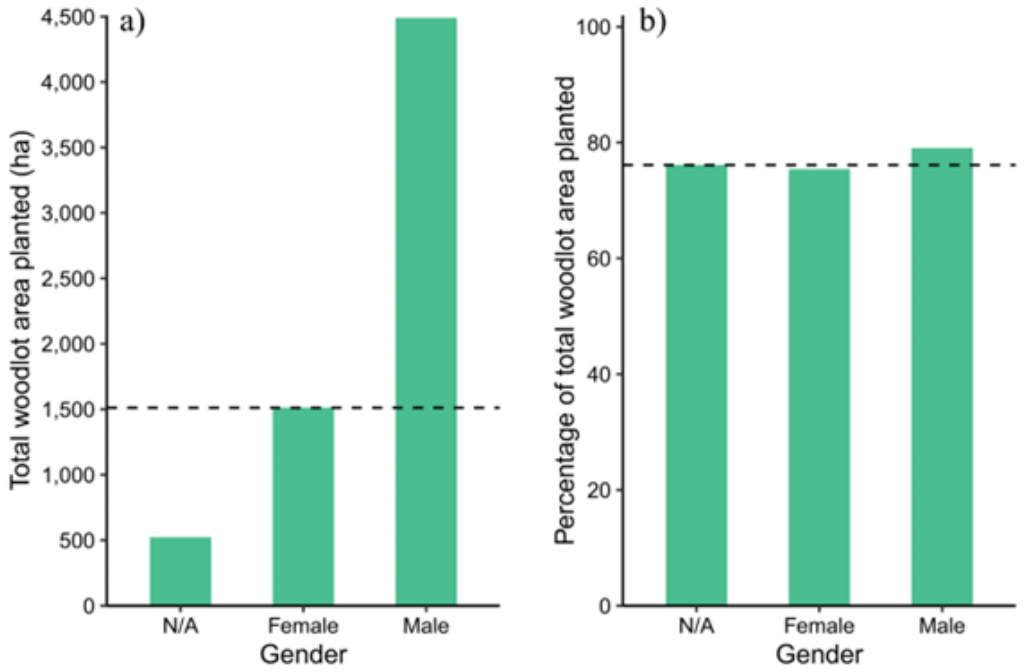
Source: Evaluation team

The comparison of the total planted area by beneficiary gender reveals distinct patterns in plantation development. The smallest planted area, totalling 522.67 ha, corresponds to woodlots for which gender information was either not provided, mostly consisting of institutional beneficiaries, or not available in PFP's spatial database (Figure 31; Table 18). Woodlots associated with female beneficiaries accounted for the second largest planted area with 1,511.60 ha, representing

33.65% of the area planted under male beneficiaries, which totalled 4,491.11 ha. The number of woodlots and the total woodlot area by gender follow the same pattern as the total planted area: the lowest values correspond to woodlots with non-available gender information, followed by those managed by female beneficiaries, while male beneficiaries account for the highest number and area of woodlots (Table 18).

However, when evaluating the efficiency of plantation development, measured as the proportion of the total woodlot area that has been planted, the differences are neglectable, and performance appears relatively balanced across gender categories (Figure 31; Table 18). Despite having the smallest total planted area, woodlots with missing gender data showed a plantation coverage of 76.14%. Female beneficiaries exhibited the lowest proportional plantation development with 75.41%, while male beneficiaries had the highest with 79.06%. This suggests that although the number of woodlots, total woodlot area, and total planted area differ significantly by gender, the relative success in planting within available woodlot areas remains consistent across groups (Figure 31; Table 18).

Figure 31 Total woodlot area planted by beneficiary gender



Total woodlot area planted (a) and percentage of the total woodlot area planted (b) by beneficiary gender. The category "N/A" corresponds to beneficiary institutions and woodlots without information on beneficiary gender or name. The categories in both plots follow the order from a) for comparability. The dashed line indicates the median value of each plot

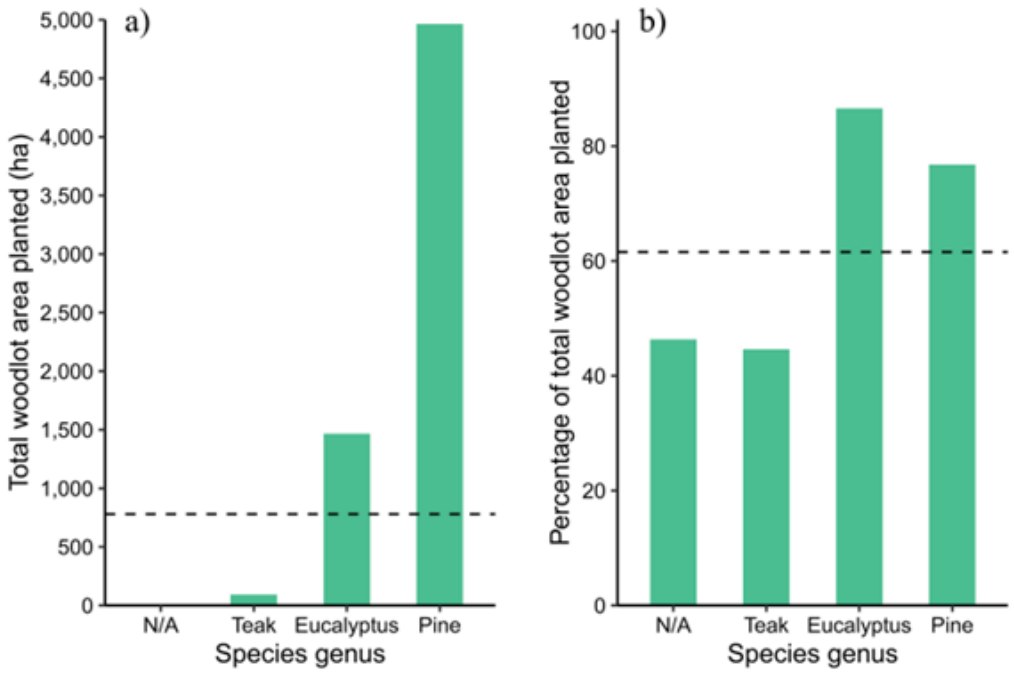
Source: Evaluation team

The analysis of species planted within PFP-supported woodlots reveals substantial variation across genera. Three woodlots lacking species genus information in the database cover a combined area of 4.57 ha, of which 2.11 ha have been planted between 2016 and 2024 (Table 19). Teak plantations are present in 342 woodlot polygons, with a total planted area of 93.05 ha. Eucalyptus, the second most widespread genus in terms of the number of woodlots (1,553 polygons), accounts for 1,466.28 ha of planted area. Pine species dominate in both extent and frequency, with 6,911

woodlot polygons and a total planted area of 4,963.94 ha, making them the most prominent genus across PFP-supported woodlots (Figure 32; Table 19).

The effectiveness of plantation development across species genera revealed two distinct patterns. Woodlots without species genus information and those where teaks were planted exhibited low planting effectiveness, with less than 50% of their total area planted between 2016 and 2024 (Figure 32; Table 19). This is particularly notable for teak, which accounted for a total woodlot area of 208.52 ha. In contrast, woodlots established for the growth of eucalyptus and pines demonstrated higher effectiveness, with 86.58% and 76.78% of their total areas, respectively, planted during the assessment period (Figure 32; Table 19).

Figure 32 Total woodlot area planted by species genus



Total woodlot area planted (a) and percentage of the total woodlot area planted (b) by planted species genus. The category "N/A" corresponds to woodlots without information on the planted species genus. The categories in in both plots follow the order from a) for comparability. The dashed line indicates the median value of each plot

Source: Evaluation team

Limitations and considerations

While this geospatial assessment provides valuable insights into the effectiveness of PFP-supported woodlots to promote plantation development, methodological and data-related limitations should be acknowledged. Data quality issues, including overlapping or missing polygons and gaps in metadata such as tree species and beneficiary gender, mean reported woodlot totals do not fully align with PFP records, yet standardisation allowed a consistent evaluation. Plantation identification relied on Normalized Difference Vegetation Index time-series, which may misclassify natural regrowth and could miss recently established plantations with immature canopy. Nevertheless, manual validation indicates that such cases are rare. Observed tree cover increases cannot be

attributed solely to PFP, as other planting or natural regrowth may contribute, and the analysis does not capture survival, density, or management quality. Female beneficiaries generally held fewer and smaller woodlots, highlighting potential inequities. Understanding the structural and cultural dynamics that influence such disparities requires complementary qualitative research and engagement with local stakeholders and cannot be directly explained by our geospatial data. The lack of complete species-level information in the woodlot metadata limits the ecological depth of this assessment. Notably, woodlots with teak showed lower planting effectiveness, which could reflect species-specific growth rates, site suitability, or management challenges not visible through remote sensing data.

Outlook for future geospatial evaluations

Our analysis demonstrates that geospatial approaches are effective for evaluating project impact across space and time. By processing 7,508 Sentinel-2 images, we tracked plantation development from 2016 to 2024 across 8,809 PFP-supported woodlots in Tanzania, highlighting the potential of free satellite data and cloud-based platforms for consistent, scalable, and cost-effective monitoring of landscape change. These tools are particularly valuable for forest-related projects, where physical outcomes occur over long periods and across dispersed locations. However, the accuracy of such evaluations depends heavily on the quality and completeness of spatial input data. The PFP woodlot dataset contained overlapping polygons, missing attributes, and inconsistent formatting, which posed challenges and may introduce bias. To enable reliable long-term monitoring, future programs should prioritise geospatial data management, including maintaining up-to-date spatial boundaries, consistent metadata standards, version tracking, and rigorous quality control. These practices would preserve the geographic footprint of interventions and support accurate assessment of project effectiveness over time.

Table 15 Summary of woodlots established by date

ESTABLISHMENT DATE	NUMBER OF WOODLOTS	TOTAL WOODLOT AREA (HA)	TOTAL WOODLOT AREA PLANTED (HA)	PERCENTAGE OF TOTAL WOODLOT AREA PLANTED
2014/15	631	756.54	703.76	93.02
2015/16	861	1,474.68	1,268.53	86.02
2016/17	3,546	3,350.8	2,479.25	73.99
2017/18	3,771	2,789.6	2,073.83	74.34

Source: Evaluation team

Table 16 Summary of woodlots by district

DISTRICT	NUMBER OF WOODLOTS	TOTAL WOODLOT AREA (HA)	TOTAL WOODLOT AREA PLANTED (HA)	PERCENTAGE OF TOTAL WOODLOT AREA PLANTED
Kilolo	234	258.47	187.32	72.47
Kilombero	192	438.46	323.94	73.88
Mbinga	785	381.78	326.31	85.47

DISTRICT	NUMBER OF WOODLOTS	TOTAL WOODLOT AREA (HA)	TOTAL WOODLOT AREA PLANTED (HA)	PERCENTAGE OF TOTAL WOODLOT AREA PLANTED
Njombe Rural	307	338.03	335.13	99.14
Nyasa	935	528.06	375.37	71.08
Mufindi	620	663.98	465.57	70.12
Songea	906	719.47	658.43	91.52
Makete	1,909	1,547.40	996.49	64.4
Njombe	650	1,427.24	1,314.6	92.11
Ludewa	2,271	2,068.73	1,542.21	74.55

Source: Evaluation team

Table 17 Summary of woodlots by village

VILLAGE	NUMBER OF WOODLOTS	TOTAL WOODLOT AREA (HA)	TOTAL WOODLOT AREA PLANTED (HA)	PERCENTAGE OF TOTAL WOODLOT AREA PLANTED
Ngoje	62	44.28	0.24	0.54
Nhungu	44	38.13	0.41	1.08
Ng'onde	187	83.58	1.09	1.30
Matembwe	11	5.91	5.91	99.96
Kigongo	41	12.13	7.19	59.30
Ndembo	50	19.61	8.83	45.05
Makangalawe	159	144.34	13.64	9.45
Holo	5	46.00	14.69	31.93
Ilindiwe	65	29.45	16.00	54.32
Idete	88	79.93	18.26	22.85
Silo	61	28.20	20.39	72.31
Mfriga	40	22.70	20.87	91.94
Kiyowela	18	28.35	23.32	82.25
Mkali A	61	49.74	23.40	47.04
Liuli	170	98.20	24.50	24.95
Ng'elamo	56	56.05	25.16	44.89
Masisiwe	69	36.21	28.45	78.56
Mapato	84	35.33	28.70	81.24
Maholong'wa	59	36.84	32.99	89.54
Utweve	94	34.38	34.02	98.97
Kiwe	120	47.12	35.06	74.40
Madeke	75	36.49	35.49	97.26
Kihangi mahuka	134	53.13	35.72	67.23

VILLAGE	NUMBER OF WOODLOTS	TOTAL WOODLOT AREA (HA)	TOTAL WOODLOT AREA PLANTED (HA)	PERCENTAGE OF TOTAL WOODLOT AREA PLANTED
Usagatikwa	64	41.22	39.80	96.57
Kitewele	103	48.72	44.79	91.94
Lipingo	111	60.59	45.16	74.53
Mbanga	97	50.31	46.10	91.63
Upolo	96	60.01	53.54	89.22
Maweso	189	61.72	61.65	99.88
Ludende	92	63.36	61.96	97.79
Magunguli	48	79.86	66.43	83.18
Lugolofu	152	110.6	68.68	62.10
Ihela	107	76.99	71.58	92.97
Lugema	55	104.10	83.91	80.61
Njelela	97	94.35	85.92	91.06
Masimbwe	61	135.57	87.34	64.43
Ibumi	340	221.17	89.90	40.65
Lilondo	97	96.81	91.74	94.77
Lusala	282	161.84	113.73	70.27
Ihanga	170	116.5	115.59	99.22
Igumbilo	141	261.71	119.84	45.79
Kijyombo	170	197.75	124.14	62.78
Lipilipili	274	137.64	126.21	91.70
Amani	129	181.28	126.27	69.65
Itambo	84	129.31	129.24	99.95
Ukimo	265	143.18	135.15	94.39
Ikang'asi	95	135.52	135.52	100.00
Ifinga	142	141.96	140.29	98.83
Mavanga	275	147.53	143.22	97.08
Mundindi	137	152.11	145.29	95.51
Uchindile	103	216.34	145.41	67.21
Litindo asili	276	161.77	146.78	90.73
Mkongotema	196	213.25	159.19	74.65
Kitete	87	221.57	177.99	80.33
Lyamko	234	258.47	187.32	72.47
Ipilimo	256	215.68	190.82	88.47
Madope	185	231.32	199.94	86.43
Ukwama	316	204.11	202.66	99.29
Wino	281	205.00	204.83	99.92
Kifanya	154	224.41	218.51	97.37
Lupila	261	238.77	229.04	95.93
Ngalanga	112	318.52	297.88	93.52

VILLAGE	NUMBER OF WOODLOTS	TOTAL WOODLOT AREA (HA)	TOTAL WOODLOT AREA PLANTED (HA)	PERCENTAGE OF TOTAL WOODLOT AREA PLANTED
Utilili	398	551.49	378.18	68.57
Iboya	219	438.54	385.86	87.99
Mgala	105	394.55	393.65	99.77

Source: Evaluation team

Table 18 Summary of woodlots by gender

GENDER	NUMBER OF WOODLOTS	TOTAL WOODLOT AREA (HA)	TOTAL WOODLOT AREA PLANTED (HA)	PERCENTAGE OF TOTAL WOODLOT AREA PLANTED
N/A*	324	686.47	522.67	76.14
Female	2,492	2,004.64	1,511.60	75.41
Male	5,993	5,680.52	4,491.11	79.06
*N/A corresponds to woodlots for which a beneficiary gender is not given as they are institutions or in some cases the beneficiary information was not available in PFP's spatial data.				

Source: Evaluation team

Table 19 Summary of woodlots by species genus

SPECIES GENUS	NUMBER OF WOODLOTS	TOTAL WOODLOT AREA (HA)	TOTAL WOODLOT AREA PLANTED (HA)	PERCENTAGE OF TOTAL WOODLOT AREA PLANTED
N/A*	3	4.57	2.12	46.34
teak	342	208.52	93.05	44.62
eucalyptus	1,553	1,693.47	1,466.28	86.58
pine	6,911	6,465.06	4,963.94	76.78
*N/A corresponds to woodlots for which a species genus information was not available in PFP's spatial data.				

Source: Evaluation team

Annex 6: Market Analysis of Forest Information Systems and Adjacent Sectors in Tanzania

This market analysis reviews the Forest Information Systems and Adjacent Sectors in Tanzania, links them to Finland's prior and current interventions in the country and maps demand to Finnish private-sector capabilities.

1. LOCAL CONTEXT AND BUSINESS ENVIRONMENT	
1.1 Description of the focus area	• Forest Information Systems, also called forest management information systems, are integrated digital platforms that gather, store, process, and analyse forest data. They enable sustainable forest management, support national reporting (such as Nationally Determined Contributions), facilitate timber traceability, and provide monitoring tools for biodiversity and carbon markets.
1.2 Status in Tanzania	• In Tanzania, digital forest information systems are emerging but remain fragmented across institutions. The Ministry of Natural Resources and Tourism, the Tanzania Forest Services, and the Vice President's Office – Division of Environment have piloted systems such as the Forest Resource Management Information System. National academic institutions like Sokoine University of Agriculture and the Tanzania Forestry Research Institute have advanced technical expertise, though with limited tools and financial resources. • The Tanzanian Forest sector is central to national development, contributing an estimated 3–4% of Gross Domestic Product and supporting livelihoods, biodiversity conservation, and climate commitments. However, pressures from deforestation, weak enforcement, and limited digital tools constrain sustainable management. • Finland's track record in promoting forest management information systems in its forestry interventions in Tanzania shows mixed results[27] but the current Forestry Land Use and Value Chain (FORLAND) programme, in collaboration with the Tanzania Tree Growers Associations Union, is expected to develop and implement a robust Forest Information System, with a platform that will provide information such as the number of tree growers, woodlots, stand age, silvicultural practices etc. for each tree grower/farmer and other stakeholder. The project also wishes to develop digital system for timber traceability (i.e. tracking on mature trees, proper drying, silvicultural, solar kilns, etc.) but feasibility of this plan depends on the investment costs, and maintenance and updating the system. For the natural forests, the project will look into digital information system platform that can work on all Village Land Use Plans to monitor land cover change, fire and other relevant aspects.

27 While FORVAC and PFP made no significant effort in contributing to promoting forest management information systems in Tanzania, apart from PFP putting in place a fire management system for digital monitoring of fire indexes, in 2016, the MFA supported the forest governance initiative, commonly known as Mamamisitu in Swahili, to pilot the Check point Information System, i.e. forest resources management information system. This was a tool to track movement of timber from the Mozambican border to Dar es Salaam Port with a purpose to monitor movement of timber consignments and reduce illegal trade. The information system was efficient and transferred data in real time to the Tanzania Forest Service (TFS), which, after the pilot, rolled-up forest resources management information system in the whole country. While MFA facilitated the NCMC and its partners to acquire data from FAO for the National Forest Resources Monitoring and Assessment (NAFORMA) phase one, and the Finnish Natural Resources Institute, Luke, participated in developing the NAFORMA II inventory methodology, the NAFORMA II resources inventory and assessment plan has not been funded yet.

1. LOCAL CONTEXT AND BUSINESS ENVIRONMENT	
1.3 Focus-area development needs and challenges	Key challenges include: • Policy gaps: The Forest Act (2002) does not mandate digital data collection or storage. • Limited funding: Investments in digital infrastructure (servers, drones, advanced software) are scarce. • Capacity constraints: Skilled staff in GIS, Remote Sensing, and AI are limited, especially at local government level. • Institutional fragmentation: Data is stored across agencies without harmonised platforms. • High costs: Tools such as drone registration and pilot training are expensive (USD 2,000–3,000 per pilot course).
1.4 General private-sector business environment	• Despite the challenges, the policy environment (e.g. ICT Policy 2016, National Environmental Policy 2021, Forest Implementation Strategy 2021–2031) provides an enabling framework for digitalisation, aligned with Tanzania Development Vision 2025 and the SDGs.

2. DEMAND WITHIN THE FOCUS AREA	
2.1 Typical client/customer segments	• Public institutions: Ministry of Natural Resources and Tourism, Tanzania Forest Service, Division of Environment, and local governments require real-time data for monitoring forest resources, reporting under UNFCCC, and enforcement of forest product movement. • Private companies: Plantation firms such as Green Resources Limited, Kilombero Valley Teak Company, and New Forest Company need digital tools for plantation management, traceability, and carbon certification. • CSOs and non-governmental organisations: Mpingo Conservation and Development Initiatives and WWF Tanzania use smartphone applications and online platforms for timber marketing and restoration monitoring. • International agencies: FAO, EU, and bilateral donors rely on digital data for national inventories and carbon trade mechanisms. • Local communities and cooperatives: Village land forest reserves and tree grower associations are increasingly engaging with smartphone-based mapping and monitoring.
2.2 Scale of demand and 5–10-year outlook	• Rising international requirements, such as the EU Deforestation Regulation, which mandates traceability of timber. • Expanding carbon market opportunities requiring robust monitoring, reporting and verification systems. • Increasing donor and government investment in climate-smart forestry, e.g. NAFORMA II (USD 5.4 million planned budget). • Private sector scaling of digital plantation management to reduce costs and losses. • Overall, the Tanzanian forest management information systems market is projected to expand from pilot-stage interventions to a national-scale market by 2030, with digital tools integrated into core forest governance.
2.3 Regional differences (if any)	• Demand for forest management information systems cuts across Tanzania's different regions.

3. COMPETITION/CURRENT OFFERING WITHIN THE FOCUS AREA

3.1 Key companies active in the sector	• Domestic actors: Techno Environment Ltd., Dronet Technologies, and Africa Insight Advisory are pioneering drone and GIS services. • International partners: Finnish companies Arbonaut, Trestima, and Origin have piloted forest management information systems and timber traceability solutions in Tanzania. • Private forestry firms: Green Resources Limited has adopted PULSE and Timbeter systems; Kilombero Valley Teak company employs drones and satellite imagery; New Forest Company uses smartphone-based data collection.
3.2 Estimated current market size reached by businesses	• The current market remains relatively small, valued mainly through donor-funded projects (USD 5–10 million annually) and private company adoption (USD 50,000–100,000 per system investment). However, the national potential is far larger, as scaling digital monitoring across 34 million has of forests would require sustained investments.

4. FINNISH COMPANIES' OFFER

Arbonaut (Finland)

- Core competencies/forest management information system roles:
  - Precision forestry/remote sensing/GIS system integration
  - Development of decision support and spatial analysis tools (e.g. ArboGIS, ProMS, fire risk, deforestation monitoring
  - Participation in REDD+/forest carbon baseline and MRV support in tropical countries
  - Capability to deliver full forest inventory, spatial baselines, and help with institutional capacity building and system integration
- Offer to Tanzania: Arbonaut could deliver inventory + baseline mapping (LiDAR, multispectral, GIS layers), spatial modules for forest management information systems, satellite/deforestation alerts integrated in forest management information system dashboards, and capacity training for local agencies. Their experience in tropical REDD+ settings is a good match.

AFRY/Simosol/MosaicMill (Finland/Sweden group)

- Core competencies/forest management information systems roles:
  - Simulation, optimisation & planning software (forest growth, harvest scheduling, scenario analysis) via Simosol (now part of AFRY)
  - Drone/satellite inventory analytics via MosaicMill (now under AFRY)
  - Integrated "Smart Forestry" offering: mapping, optimisation, monitoring, supply chain visibility, adaptive management under AFRY umbrella
  - Experience in delivering tactical planning to large public forest owner (e.g. Metsähallitus in Finland)
- Offer to Tanzania: AFRY (via Simosol/MosaicMill) could provide the simulation & optimisation engine for forest management information systems (strategic & tactical levels), inventory & remote sensing modules, cloud decision support dashboards, and consultancy/implementation with software engineering to integrate with national systems.

Trimble Forestry (via Finnish subsidiaries/operations)

- Core competencies/forest management information systems roles:
  - Enterprise forest management information systems/ERP for forest operations (track wood procurement, harvesting, transport, ticketing, logistics) (i.e. the *Connected Forest®* suite)
  - Strong track record in private-sector forestry systems, mill–forest chain integration
- Offer to Tanzania: Trimble Forestry could supply robust "backbone" forest management information systems modules for operational workflows (forest → mill), mobile field data collection, integration with spatial modules, and change-management templates for scaling from pilot to full deployment.

4. FINNISH COMPANIES' OFFER

Bitcomp/Sitowise (Finland)

- Core competencies/forest management information systems roles:
  - Forest data platforms, web & mobile services for forest owners/agents
  - Map services, APIs, spatial data portals, and integration layers
  - Experience supporting national forest data ecosystems in Finland (through Bitcomp, now under Sitowise)
- Offer to Tanzania: They could build the front end/portal/owner/stakeholder interface of forest management information systems, mobile applications for field staff, APIs for data exchange, spatial services, and help integrate with national GIS/cloud infrastructure.

CollectiveCrunch ("Linda Forest")

- Core competencies/forest management information systems roles:
  - AI/machine learning for forest inventory estimation, species classification, health/risk analytics from remote sensing
  - SaaS model to provide continuous updates and monitoring, complementing periodic field inventory
- Offer to Tanzania: They could act as a "refresh" layer in the forest management information systems: augmenting inventory estimates between ground campaigns, flagging anomalies (dieback, pest, disturbance), enabling more dynamic management and monitoring.

ICEYE

- Core competencies/forest management information systems roles:
  - Synthetic Aperture Radar (SAR) satellite services for all-weather, cloud-penetrating change detection
  - Near real-time alerts for deforestation, degradation, disturbance
- Offer to Tanzania: ICEYE can feed a continuous alerting subsystem into forest management information systems (e.g. deforestation alerts, storm damage, illegal logging detection) especially valuable in tropical, cloud-prone regions.

Kuva Space (including heritage Terramonitor)

- Core competencies/forest management information systems roles:
  - Optical/hyperspectral/multispectral change detection pipelines
  - Spatial analytics and historic change mapping (e.g. Terramonitor background)
  - Integration of satellite analytics into operational mapping workflows
- Offer to Tanzania: Kuva Space could supply the change-detection, regeneration monitoring, land-use change layer of forest management information systems, ensuring maps are refreshed, illegal conversion is caught, and integration with traceability or compliance modules.

Trestima

- Core competencies/forest management information systems roles:
  - A smartphone-photo–based forest inventory system. Crews take geo-tagged photos; Trestima's cloud extracts stand metrics (basal area, stem count, volume, height, species) and returns plots/stand summaries. It runs offline in the field and syncs to a web service.
- Offer to Tanzania: Equip TFS/provincial teams and plantation managers with Trestima for rapid stand updates, compartment datasets, and pre-harvest checks; pipe results to a central forest management information systems and to mobile map apps used by forest rangers

5. CONCLUSIONS:

The Tanzanian market for forest information systems is at an inflection point. Evidence from Finnish-supported initiatives shows that digitalisation can improve efficiency, transparency, and revenue collection in the forest sector. Demand is accelerating due to global compliance requirements (such as EU Deforestation Regulation), the carbon market, and Tanzania's own drive towards digital government systems.

For Finnish companies, opportunities lie in:

- Technology transfer: Providing advanced forest mensuration, traceability, and AI-driven tools.
- Partnerships with local ICT firms: Building capacity and ensuring sustainability of solutions.
- Carbon monitoring and monitoring, reporting and verification systems: Leveraging Finnish expertise in satellite data, remote sensing, and forest inventories.
- Training and capacity building: Working with universities and agencies to address human resource gaps.

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Peer-reviewed discussion of Trestima as a pre-harvest estimator: https://iforest.sisef.org/contents

Annex 7: Market Analysis of Forest Information Systems and Adjacent Sectors in Vietnam

This market analysis reviews the Forest Information Systems and Adjacent Sectors in Vietnam, links them to Finland's prior and current interventions in the country and maps demand to Finnish private-sector capabilities.

1. LOCAL CONTEXT AND BUSINESS ENVIRONMENT	
1.1 Description of the focus area	• Forest Information Systems, also called forest management information systems, are integrated digital platforms that gather, store, process, and analyse forest data. They enable sustainable forest management, support national reporting (such as Nationally Determined Contributions), facilitate timber traceability, and provide monitoring tools for biodiversity and carbon markets.
1.2 Status in Vietnam	• Vietnam has undergone a remarkable transformation in its forestry sector over the past two decades, evolving from a country with severe deforestation to one of the global leaders in forest cover restoration and wood product exports. By 2024, Vietnam's forest area reached 14.87 million ha, covering approximately 42% of its territory. Planted forests accounted for 4.7 million ha, while natural forests stood at just over 10 million ha. • Forestry is both an economic driver and an ecological cornerstone. The sector underpins rural livelihoods, biodiversity conservation, and Vietnam's commitments under the Paris Agreement. The wood industry alone generated exports valued at USD 17.3 billion in 2024, placing Vietnam among the top five exporters globally. In parallel, the Payment for Forest Environmental Services scheme generated USD 162 million in 2023, directly benefitting more than 240,000 households. • Vietnam pioneered FORMIS, a Finland-supported forest management information systems developed between 2009 and 2018. It remains operational, particularly through its Forest Resource Monitoring System, which standardises and digitises forest inventory and monitoring data. • However, FORMIS has become largely inward-facing, with restricted public access and limited interoperability with other national databases. Adjacent digital sectors – such as remote sensing, carbon accounting, fire monitoring, and legality verification – are increasingly recognised as growth areas. These systems are essential for Vietnam to implement international commitments, including Forest Law Enforcement, Governance and Trade licensing with the European Union, the United Nations Reducing Emissions from Deforestation and Forest Degradation programme (UN-REDD), and carbon markets.
	• The FORMIS initiative demonstrated how digital innovation can transform forest governance. Over 2,500 officials were trained, and real-time monitoring through GPS-enabled devices became standard practice in many provinces. Yet, FORMIS now faces obsolescence: technical maintenance is inconsistent, integration with Vietnam's broader digital transformation agenda is weak, and one quarter of provinces experience partial system breakdowns. • In contrast, new national initiatives in digital government, such as the 2020 National Digital Transformation Program, have created strong demand for modernised, interoperable systems. Within forestry, the state aims to develop a unified national forest database integrated with land-use and natural resources platforms.

1. LOCAL CONTEXT AND BUSINESS ENVIRONMENT	
1.3 Focus-area development needs and challenges	• Structural challenges: Vietnam's administrative reform in 2025 merged ten ministries into five and consolidated provinces and communes, requiring forest governance systems like (FORMIS to adapt rapidly to new institutional structures. • System Upgrade and Integration: FORMIS must be restructured to align with the 2025 administrative reform and linked to broader national data platforms. • Openness and Data Sharing: Current restrictions undermine transparency and community participation. Development partners advocate for open-data models. • Sustainability of Technology: Weak ICT capacity and insufficient budgets for system maintenance risk further decline. • Community Inclusion: Grassroots empowerment projects like ActionAid's PFG highlighted the benefits of local access to information, but restrictions on FORMIS data limit such impacts. • International Compliance: Meeting European Union timber legality standards and REDD+ requirements necessitates advanced traceability and carbon monitoring tools.
1.4 General private-sector business environment	• The governance framework has modernised significantly. The 2017 Forestry Law, effective since 2019, mandates forest inventories, monitoring, and database management. Complementary regulations, including Circular 33 (2018) and Circular 16 (2023), provide operational guidance. In 2024, the Prime Minister approved the National Forestry Plan (2021–2030, vision to 2050), which prioritises integrated forest information systems, digitalisation, and technology adoption. • Vietnam's private sector is dynamic, with large technology firms such as Viettel and FPT leading national digitalisation. The wood-processing industry is globally competitive, increasingly driven by sustainability certifications. Small and medium-sized enterprises (small-, and medium-sized enterprises) dominate rural forestry-related enterprises, but they face barriers to accessing finance, technology, and reliable data. • The government promotes public–private partnerships and foreign investment in environmental technologies. Donor programmes (World Bank, Asian Development Bank, European Union) have supported digital solutions in natural resource management, creating opportunities for niche expertise providers, including Finnish forestry ICT companies.

2. DEMAND WITHIN THE FOCUS AREA	
2.1 Typical client/customer segments	• Government Agencies: Ministry of Agriculture and Environment, Department of Forestry and Forest Protection. • International Donors and Programmes: World Bank's Forest Carbon Partnership Facility, UN-REDD, European Union Forest Law Enforcement, Governance and Trade. • Private Enterprises: Large timber exporters, certification bodies, eco-tourism operators. • Communities and Cooperatives: Particularly ethnic minorities engaged in Payment for Forest Environmental Services.

2. DEMAND WITHIN THE FOCUS AREA	
2.2 Scale of demand and 5–10-year outlook	• Carbon Monitoring and monitoring, reporting and verification systems: Scaling REDD+ and voluntary carbon markets. • Timber Traceability Tools: Critical for Forest Law Enforcement, Governance and Trade licensing expected by 2025. • Disaster Risk and Fire Monitoring: Growing relevance with climate change. • Interoperable Databases: Alignment with national digital platforms. • Demand is expected to grow significantly, with annual digital forestry investment needs estimated at USD 30–50 million, largely through donor support and public budgets.
2.3 Regional differences (if any)	• Demand for forest management information systems cuts across Vietnam's different regions.

3. COMPETITION/CURRENT OFFERING WITHIN THE FOCUS AREA	
3.1 Key companies active in the sector	• Domestic Leaders: Viettel, FPT (large-scale ICT system integrators). • International Donors: JICA (Japan International Cooperation Agency), KfW (Germany), FAO (United Nations Food and Agriculture Organisation). • Local Niche Firms: Green Field Consulting, Vietnam Forestry Association. • Finnish Presence: Simosol (now part of AFRY), collaborating with the Vietnam Forestry Association on digital marketplace solutions.
3.2 Estimated current market size reached by businesses	• The market for forest information systems in Vietnam is not yet fully monetised but can be valued indirectly through project budgets. Major donor and state investments in forestry digitalisation have averaged USD 20–30 million annually since 2018.

4. FINNISH COMPANIES' OFFER

Arbonaut (Finland)

- Core competencies/forest management information systems roles:
  - Precision forestry/remote sensing/GIS system integration
  - Development of decision support and spatial analysis tools (e.g. ArboGIS, ProMS, fire risk, deforestation monitoring
  - Participation in REDD+/forest carbon baseline and monitoring, reporting and verification support in tropical countries
  - Capability to deliver full forest inventory, spatial baselines, and help with institutional capacity building and system integration
- Offer to Vietnam: Arbonaut could deliver inventory + baseline mapping (LiDAR, multispectral, GIS layers), spatial modules for forest management information systems, satellite/deforestation alerts integrated in forest management information systems dashboards, and capacity training for local agencies. Their experience in tropical REDD+ settings is a good match.

AFRY/Simosol/MosaicMill (Finland/Sweden group)

- Core competencies/forest management information systems roles:
  - Simulation, optimisation and planning software (forest growth, harvest scheduling, scenario analysis) via Simosol (now part of AFRY)
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  - Integrated "Smart Forestry" offering: mapping, optimisation, monitoring, supply chain visibility, adaptive management under AFRY umbrella
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- Core competencies/forest management information systems roles:
  - Enterprise forest management information systems/ERP for forest operations (track wood procurement, harvesting, transport, ticketing, logistics) (i.e. the *Connected Forest®* suite)
  - Strong track record in private-sector forestry systems, mill–forest chain integration
- Offer to Vietnam: Trimble Forestry could supply robust "backbone" forest management information systems modules for operational workflows (forest → mill), mobile field data collection, integration with spatial modules, and change-management templates for scaling from pilot to full deployment.

Bitcomp/Sitowise (Finland)

- Core competencies/forest management information systems roles:
  - Forest data platforms, web and mobile services for forest owners/agents
  - Map services, APIs, spatial data portals, and integration layers
  - Experience supporting national forest data ecosystems in Finland (through Bitcomp, now under Sitowise)
- Offer to Vietnam: They could build the front end/portal/owner/stakeholder interface of forest management information systems, mobile applications for field staff, APIs for data exchange, spatial services, and help integrate with national GIS/cloud infrastructure.

CollectiveCrunch ("Linda Forest")

- Core competencies/forest management information systems roles:
  - AI/machine learning for forest inventory estimation, species classification, health/risk analytics from remote sensing
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- Offer to Vietnam: They could act as a "refresh" layer in the forest management information systems: augmenting inventory estimates between ground campaigns, flagging anomalies (dieback, pest, disturbance), enabling more dynamic management and monitoring.

4. FINNISH COMPANIES' OFFER

ICEYE

- Core competencies/forest management information systems roles:
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  - Near real-time alerts for deforestation, degradation, disturbance
- Offer to Vietnam: ICEYE can feed a continuous alerting subsystem into forest management information systems (e.g. deforestation alerts, storm damage, illegal logging detection) especially valuable in tropical, cloud-prone regions.

Kuva Space (including heritage Terramonitor)

- Core competencies/forest management information systems roles:
  - Optical/hyperspectral/multispectral change detection pipelines
  - Spatial analytics and historic change mapping (e.g. Terramonitor background)
  - Integration of satellite analytics into operational mapping workflows
- Offer to Vietnam: Kuva Space could supply the change-detection, regeneration monitoring, land-use change layer of forest management information systems, ensuring maps are refreshed, illegal conversion is caught, and integration with traceability or compliance modules.

Trestima

- Core competencies/forest management information systems roles:
  - A smartphone-photo–based forest inventory system. Crews take geo-tagged photos; Trestima's cloud extracts stand metrics (basal area, stem count, volume, height, species) and returns plots/stand summaries. It runs offline in the field and syncs to a web service.
- Offer to Vietnam: Support the Vietnam Meteorological and Hydrological Administration (VMHA) and the Ministry of Agriculture and Rural Development (MARD), together with forest companies, for dense stand sampling in difficult terrain; use it to keep forest inventories current between larger National Forest Inventory (NFI) cycles and for contractor Quality Control (QC).

5. CONCLUSIONS:

Vietnam's forestry sector is both a global leader in exports and an innovator in environmental finance through Payment for Forest Environmental Services. However, forest information systems remain underdeveloped compared to the country's broader digital transformation. The closure and stagnation of FORMIS underscore the urgent need for modernisation, integration, and open data approaches.

For Finnish forestry ICT companies, opportunities are substantial but must be pursued through carefully structured partnerships. Adaptation of proven technologies – forest carbon accounting, traceability, fire monitoring – offers the most viable entry points. Subcontracting to large Vietnamese ICT firms or donor-funded projects is the most realistic pathway in the near term.

Leveraging Finnish private sector instruments such as Finnpartnership and Finnfund, and aligning with international donor programmes, can mitigate risks and create footholds. The combination of Vietnam's growing forest product exports, evolving carbon market engagement, and strong digitalisation agenda make it a strategic market for Finnish expertise in sustainable and digital forestry solutions.

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Annex 8: Comparable actions by like-minded peer countries

The objectives of comparing practices among like-minded peer countries

The objective of the peer review is to identify prerequisites and successful engagement strategies and tactics used by such country/countries. The aim is only to compare the main points of what peers are doing in selected themes with the equivalent practices by MFA in those same themes, with a view of identifying strategies and tactics which MFA might adopt to improve its own policy delivery. Like-minded peer countries are taken to include Nordic countries (e.g. Denmark, Sweden) and other smaller European countries (e.g. Ireland, the Netherlands, Switzerland). These share Finland's commitment to Gender Equity and Social Inclusion, the human rights-based approach and environmental sustainability, and are also known to be active in thematic areas that overlap with one or more sub-sectors of this evaluation. In the Forests, Ecosystems and Biodiversity sub-sector, the desk studies identified such overlaps with Denmark and Switzerland.

The strategic impact sought by interventions in the Forests, Ecosystems and Biodiversity sub-sector can be summarised as being to achieve Forests, Ecosystems and Biodiversity-related SDGs and Multilateral Environmental Agreement goals so that sustainably managed forests and other ecosystems continue to store carbon, protect biodiversity and provide other goods and services that support employment, income and added value. The theory of change figure in section 2 provides the framework for analysis.

Denmark as a Like-minded peer country in the Forests, Ecosystems and Biodiversity sub-sector

The target system: Indigenous peoples and tropical forests

The 1980s saw rapid growth in global awareness of tropical deforestation and associated loss of biodiversity and forest-dependent human ways of living including traditional knowledge and languages possessed by peoples indigenous to forested areas. This change in public opinion helped to shape the priorities of the ODA and charity sectors, and many new opportunities were created in the field of community-based resource management in the tropics. It was later realised that the rapid destruction of tropical forests had become a major contributor to greenhouse gas emissions and global heating. This was addressed by UNFCCC from the 1997 meeting in Kyoto onwards, culminating in the 2009 meeting in Bali which clarified what the international community should to do about this additional threat to life on Earth.

The example chosen here is work funded by Ministry of Foreign Affairs of Denmark on reducing tropical deforestation by collaborating with forest-dwelling and forest-dependent indigenous peoples and local communities in multiple tropical countries, but with enhanced tenure security and land rights in Bolivia as a focus (details in Chapter 6 of Caldecott, 2021; Appendix Q of Caldecott *et al*., 2021). This was done directly by the development cooperation branch of MFA Denmark (Danida), through projects such as a sequence in 1998–2018 to protect indigenous land rights in Bolivia. It was also done indirectly through MFA Denmark framework support (initially via Danida and later the Danish Civil Society Fund; CISU' to Verdens Skove ('Forests of the World'), an non-governmental organisation based in Copenhagen but active with forest-dwelling and forest-dependent indigenous peoples and local communities in multiple tropical countries, including Bolivia from 2008.

All such work was in line with Denmark's 2004 *Strategy for Danish Support to Indigenous Peoples*, the objective of which was "to strengthen the right of indigenous peoples to control their own development paths and to determine matters regarding their own economic, social, political and cultural situation." It continues in the context of Denmark's 2025 *Strategy for Development Cooperation* (MFA Denmark 2025), in which indigenous peoples' rights are clearly prioritised, with a commitment to Free, Prior and Informed Consent as a fundamental principle in all engagements. The Strategy also states that green initiatives must be more integrated across climate, water, environment, and nature, and closely aligned with other development goals such as health, food security, and job creation. Forest initiatives are given as a good example, as forests absorb a third of global carbon emissions, protect biodiversity, and regulate water cycles.

Theory of change and overview of the like-minded peer country intervention

The Finnish theory of change and the results of the Danish policy and the selected intervention closely match each other. The long-range results anticipated from enhanced land tenure, environmental education, participatory development planning and support for community-based resource management and the micro-, small- and medium-sized enterprises s enabled by this strategy include Environmental, Social, Economic and Cooperative results, in the sense that many indigenous peoples share the same priorities, and are networked with and learn from one another. These would logically result from all the **medium-range results**, which comprise stronger knowledge, practices and institutions for ecosystem management, sustainable use of renewable natural resources by community-owned enterprises, and equitable benefit sharing.

These would logically flow from all the **short-range results** that the interventions themselves introduced, which comprise: Assessment/mapping of renewable natural resources, Sustainable ecosystem use - in partnership with national authorities in the sense that clear roles, rights and responsibilities are central to successful partnerships, micro-, small- and medium-sized businesses based on diverse ecosystem goods and services, Participatory management of ecosystems, Public institutions benefit from compliance with national policy and enhanced ecological integrity, and Participatory learning and sharing on renewable natural resource management. Hence there is a robust logical pathway from the interventions to their ultimate outcomes, consistent with Danish and Bolivian policy and founded on respectful and supportive relationships with indigenous peoples in line with their primary desire and need for secure land tenure.

Evidence for how this worked out in practice comes from the following highlights of Danida's and Verdens Skove' work with indigenous peoples in Latin America.

- **On indigenous territories and avoided deforestation**. The parts of the Bolivian Amazon where indigenous territories received community land titles with Danida's and Verdens Skove's help are often now green islands in a sea of new soya plantations. This, supported by other evidence from Perú and Brazil, strongly suggests that indigenous territories are the only effective governance mechanism able to withstand deforestation under modern conditions in the Amazon. Emissions avoided by Danish-funded land titling here equate to about 4 Gt of carbon in biomass and 80 Mt of carbon absorbed annually.
- **On indigenous territories and co-benefits.** Actions that benefit indigenous peoples are likely to have a disproportionate effect on relieving poverty, since they comprise 6% of the world's population but 15% of the world's poorest people. Also, secure indigenous territories are at least as effective as national parks at protecting biodiversity and natural forests. Interviewees made the point that biodiversity, forests, indigenous interests, poverty and climate change mitigation are inseparable, and that global mitigation targets cannot be met without halting tropical deforestation.
- **On promoting indigenous territorial security**. Opportunities have grown with ubiquitous smartphones and the availability of satellite-assisted georeferencing, surveillance and carbon density mapping to support community planning and monitoring. The combination of highly motivated and networked indigenous communities, new technology, modest financial support per unit area, and technical cooperation with non-governmental organisations and universities to document impact and support informed dialogue can be very cost-effective in resisting deforestation pressures.
- **On climate change mitigation as a co-benefit of protecting indigenous land rights, forest biodiversity and livelihoods.** It is known that mature tropical forests contain large amounts of carbon (usually in the 100-1,000 tC/ha range), that they absorb several tC/ha/year during regrowth after disturbance, and that avoiding deforestation can be a very cost-effective way to prevent the release of greenhouse gases at scale, often with immediate effect, and with abundant co-benefits. Thus, the evidence suggests that the long-term indigenous partnerships through which Verdens Skove works, and its community-based conservation, education and empowerment projects in tropical forest areas are strong sources of mitigation effectiveness.

Switzerland as a like-minded peer country in the Forests, Ecosystems and Biodiversity sub-sector

The target system: peoples and ecosystems in various contexts

A comprehensive evaluation of Climate Change Adaptation and Climate Change Mitigation projects by the Swiss Agency for Development and Cooperation highlighted four interventions that stood out for their high **transformative potential** (Caldecott and Olding, 2022). This pilot criterion required each target system to be considered as a whole and involved judging whether the project was likely to result in system-wide changes in its strength (for Climate Change Adaptation) or greenhouse gas emissions (for Climate Change Mitigation). It therefore indicates the extent and direction of travel of a target system in the direction of the **complete system change** that is often called for if the multiple crises of nature, climate, pollution, poverty and inequality is to be addressed successfully.

Three of these projects (**Biocultura** in Bolivia, **Green Gold** in Mongolia, and the **Agro-biodiversity Initiative in Lao PDR**) were seen as having the purpose and effect of empowering local communities over land use. This translates in practical terms as being to use whatever techniques are appropriate in the local context: (a) to encourage them (e.g. through environmental education) and (b) enable them (e.g. through organising, training, learning, networking and tenure security) to (c) make and put into effect their own informed decisions about the use of land and renewable natural resources in their own homeland ecosystems. A fourth project (**SASA** and associated initiatives in Southern Africa), focused on promoting agroecological farming through farmer-managed seed systems, farm input subsidy programmes and networks to build capacity, awareness and confidence in agroecological farming. This kind of farming was considered resilient to environmental changes and shocks, and thus to have significant transformative potential for Climate Change Adaptation.

Theory of change and overview of the Like-minded peer countries intervention.

The essence of all four of these projects was to empower local actors over the biodiversity, ecosystems and knowledge required for their own livelihoods. Similar to the Danish example, these interventions funded by the Swiss Agency for Development and Cooperation have largely had a similar approach to Forests, Ecosystems and Biodiversity support that aligns well with the Finnish approach laid out in the theory of change in chapter 2. Annexes 1-4 summarise the four interventions, which are condensed as follows.

- **Biocultura in Bolivia**. This helped strengthen laws, accountable governance and planning at all levels, in favour of adaptation and mitigation by excluding open-access regimes of exploitation and encouraging more accountable decision-making, especially in the vulnerable Andean region. It is recognised as having shaped key parts of the Bolivian government's policy position on climate change, which has since become influential across the Americas. Promoting ecosystem protection in line with local interests implies net carbon capture that was recognised in high transformative potential for Climate Change Mitigation.
- **Green Gold in Mongolia**. This consolidated two long-running multi-phase Swiss Agency for Development and Cooperation projects on animal health and pasture health and governance. It enabled pastoralists to manage and monitor their own herds and rangelands and become stronger in protecting and advancing their own collective interests in ways that are strongly adaptive to changing biophysical circumstances, and hence with significant transformative potential for Climate Change Adaptation. Promoting pasture ecosystem protection and restoration in line with local interests implies net carbon capture that was recognised in high transformative potential for Climate Change Mitigation.
- **The Agro-biodiversity Initiative in Lao PDR**. This explored livelihood options using the rich resources of agrobiodiversity, non-timber forest products and traditional knowledge of the Lao uplands, while engaging local people in clarifying tenure and planning the use of their village lands and forests in ways recognised by the state. It stabilised **shifting cultivation systems and was quickly upscaled to exert a wide influence.**

- **Strengthening Agrobiodiversity in Southern Africa (SASA)**. Implemented by the African Centre for Biodiversity, this promoted policies favouring small farmers. Such policies ensure their representation, and open policy spaces for seed diversity and agroecology through farmer-managed seed systems, farm input subsidy programmes and networks across the Southern African Development Community region to build capacity, awareness and confidence in agroecological farming, which being robust to environmental change and shock have significant transformative potential for Climate Change Adaptation. Promoting agroecological farming implies scalable carbon capture that was recognised in significant transformative potential for Climate Change Mitigation.

MFA Finland actions

Key MFA Finland partners that offer unique perspectives and complementary actions in the Forests, Ecosystems and Biodiversity space include WWF Finland and Siemenpuu Foundation from Finland and IUCN.

Since the early 2000s, the **conservation programmes of WWF Finland** have been conducted to support the objectives of the conservation programme of WWF International. The partner programmes receiving funding from WWF Finland multi-year programme are located under WWF's international conservation programmes and managed by local WWF offices. The first multiyear programme (2014–2017) was built around the themes of biodiversity, people, good governance and ecological footprint. It provided support to the Coastal East Africa Initiative in Tanzania and Mozambique as well as Living Himalayas Initiative in Bhutan, Nepal and India that were part of the WWF Global Initiatives. In addition, MFA funds were used to support WWF country programmes in Indonesia, Nepal and Bhutan.

By improving the wellbeing of people and increasing sustainable livelihood opportunities, the aim of the 2018–2021 programme was long-term sustainability and reduction of unsustainable use of natural resources. The programme efforts also contributed to WWF's overall mandate of improved conservation of biodiversity and balanced future for the nature and people. The programme contributed to the achievement of the sustainable development goals and WWF's global goals to secure biodiversity and to halt the increase of our ecological footprint. Community forestry was an overarching topic common to all partners of the programme.

The goal of the current WWF Finland Programme for 2022–2025 is to improve the protection and management of 9 WWF priority landscapes in Asia, Africa, and Latin America,[28] specifically to improve the biodiversity of these landscapes and to secure safe habitats for threatened species and valuable ecosystem services and well-being for people. The landscapes are WWF network priority areas which have been identified to need urgent conservation to preserve unique ecosystems, biodiversity, and endangered species; many of them are in the global deforestation fronts which face high rates of forest and biodiversity loss.

Siemenpuu Foundation was established in 1998. Siemenpuu first received MFA funding in 2001. (Chapman and Saarilehto 2017). Since 2015/16, MFA has supported Siemenpuu through its

28 Kenya, Northern Highlands Landscape (Madagascar), Water Towers Landscape (Tanzania), Greater Virunga Landscape (Uganda), Muller Schwaner and Arabela Landscape & West Papua Landscape (Indonesia), Central Annamites Landscape (Laos), Ayerwady Landscape (Myanmar), Terai Arc Landscape & Mountain Landscape (Nepal), and Itenez Landscape (Bolivia).

programme-based support instrument. The Foundation channels support through grant schemes to small, local projects of Non-Governmental Organisations, Community-based organisations and Organisations of Disabled Persons in developing countries.

During the 2018—2021 programme period, the main funding themes were: i) A Just Transition to Ecological Democracy, ii) Forests and Coastal Ecosystems, iii) Biocultural Rights of Indigenous Forest Communities, iv) Rural Women and Food Sovereignty, and v) Climate and Energy Justice. Focus countries were Brazil, Indonesia, India, Mali, Myanmar and Nepal. The supported projects developed sustainable livelihoods of local rural communities, for example, by diversifying the value and marketing chains of small-scale forest products and food production, and by supporting the organisation of communities into savings and small loan groups and cooperatives.

The current programme of Siemenpuu Foundation (2022–2025) aims to improve rural communities' equal opportunities to develop sustainable livelihoods and participate in the decision-making regarding their environment. Focus countries are Kenya, Liberia, Mali, Mozambique and Myanmar. The programme supports strengthening the diverse and multi-voiced civil society, which strives for environmental justice, particularly by advancing collaboration and networking. In all projects, biodiversity and climate sustainability are strengthened. Supported projects are designed and implemented by local CSOs in target countries.

In the Nature 2030 Programme (IUCN 2021), the vision of **IUCN** is "A just world that values and conserves nature" and the mission is "Influence, encourage and assist societies to conserve the integrity and diversity of nature and ensure that any use of natural resources is equitable and ecologically sustainable." The Nature 2030 Programme contributes to the Sustainable Development Goals with focus on SDG 13 Climate Action and SDG 15 Life on Land and to the 2030 targets of the Kunming-Montreal Global Biodiversity Framework. The Programme defines five broad areas where IUCN is working to deliver tangible positive impacts:

- People: Biodiversity is nurtured in harmony with human well-being, based on the principles of equity, equality and justice.
- Land: Intact landscapes are protected while sustainable use balances the needs of people and nature on production and urban land.
- Water: Freshwater systems support and sustain biodiversity and human needs.
- Oceans: Stronger legal frameworks and investment in biodiversity restoration ensure a healthy ocean supporting nature and people.
- Climate: Global temperature rise is limited to 1.5°C through ambitious mitigation measures, alongside effective adaptation

To deliver its programme as mandated by its Members, the IUCN manages a wide portfolio of conservation projects aimed at mitigating environmental challenges of habitat loss, restoring ecosystems and improving people's well-being sustainably. IUCN is a GEF Agency and an Accredited Partner to Green Climate Fund. MFA has been a long-term partner of the IUCN Programmes since 2001 and in 2010 Finland became IUCN's Framework Partner. (MFA 2010, MFA and IUCN 2021).

According to an external evaluation of the 2021–2024 work programme (Aleph Strategies Limited 2024), the Nature 2030 is strongly aligned with the global nature conservation and development priorities, for example between Nature 2030 Programme and the Global Biodiversity Framework.

Biodiversity conservation remains at the core of IUCN's agenda, cross cutting all work streams of action, knowledge and policy. Nature 2030 explicitly makes provision for deeper alignment with Global Biodiversity Framework in the next Programme cycle of 2024–2028 and situates the vision of the Global Biodiversity Framework of living in harmony with nature by 2050 at the centre of the Programme. Much of IUCN's work is aligned with the Global Biodiversity Framework, for instance, IUCN's World Commission on Protected Areas develops knowledge-based policy, advice and guidance on the full range of issues related to protected areas.

Each of these programmes comply the long-, medium- and short-range results expected of the Forests, Ecosystems and Biodiversity Theory of Change. All these programmes contribute to almost all results. Perhaps the only exception is the programme of Siemenpuu Foundation that is specifically targeting public institutions.

Comparison of MFA Denmark, Switzerland and MFA Finland actions

The key take home message of the review is that both the Danish and Swiss cases provide positive examples of functional approaches that are delivering results at short-, medium, and long-term. But MFA Finland and its partners compare well – they deliver results much in the same way the peers do. The common strengths are as follows:

1. It is important to keep enhanced tenure security and land rights as a focus when working towards reducing tropical deforestation by collaborating with forest-dwelling and forest-dependent indigenous peoples and local communities in multiple tropical countries. The Danish and Swiss cases also have the link to the effectiveness of village land forest reserves in Tanzania - and the general point (that not all ODA agencies appreciate, unfortunately) that tenure security for indigenous peoples and local communities is the first and most important thing that needs to be done when trying to conserve ecosystems for SMSE, human rights, biodiversity, climate or catchment purposes. Finland's partners apply similar practices and principles in their work.
2. All seven cases demonstrate that biodiversity, forests, indigenous interests, poverty and climate change mitigation are inseparable, and that global mitigation targets cannot be met without halting tropical deforestation. The programmes of WWF Finland and Siemenpuu Foundation address both people and biodiversity: WWF acknowledges that improving the wellbeing of people and increasing their options for sustainable livelihoods is needed for reduction of unsustainable use of natural resources and conservation of biodiversity. Siemenpuu's programme has shown that local entrepreneurship supports biodiversity protection, climate resilience and the rights of local communities to natural resources and land management. IUCN manages a wide portfolio of conservation projects aimed at mitigating environmental challenges of habitat loss, restoring ecosystems and improving people's well-being sustainably.
3. These cases also reflect examples of long-term partnerships which are considered a pre-condition for sustainable results. MFA Denmark supported a sequence of projects in Bolivia in 1998–2018. The duration of Swiss Agency for Development and Cooperation's Green Gold Projects in Mongolia were operational from 2004 to 2017. The duration of the

Agro-biodiversity Initiative in Lao PDR was ten years. Similarly, partnerships MFA has with Finnish CSOs also go back many years with WWF Finland receiving project support already in 1980s and Siemenpuu Foundation from 2001 onwards.

4. The case in Bolivia is an example of MFA Denmark framework support to Danish CSOs. This example is quite similar to the programme-based support instrument that MFA uses to channel funds to larger CSOs in Finland. MFA Finland started the instrument initially in 2003 (Virtanen et al 2008).

Annex 9: List of institutions consulted

ORGANISATION/UNIT	NUMBER OF INFORMANTS
Cowater International Finland Ltd	2
Embassy of Finland, Dar es Salaam	2
Embassy of Finland, Hanoi	2
FAO, Global Forest Resource Assessment	1
Finnfund	1
Finnpartnership	1
Food and Forest Development Finland	1
FORVAC technical assistance team	2
Independent experts	2
Indufor Ltd	1
IUCN, Economy and Finance Team	1
IUCN, Institutional Performance Management and Evaluation Unit	1
IUCN, Strategic Partnerships Unit	1
MFA – Department for Asia and Oceania	1
MFA - Department for Development Policy/Climate and Environmental Diplomacy Unit	4
MFA – Department for International Trade	1
Ministry of Agriculture and Forestry, Natural Resources Department	1
Ministry of the Environment	2
Siemenpuu Foundation	1
UNEP, Ecosystems Division	1
UNEP, Resource Mobilisation	1
WWF Finland	2
Private sector companies[29]	
Dronet Technologies (Tanzania)	1
Green Field Company (Vietnam)	1
Green Resources Limited (Tanzania)	1
Kilombero Valley Teak Company (Tanzania)	1
New Forest Company (Tanzania)	1

29 Kenya, Northern Highlands Landscape (Madagascar), Water Towers Landscape (Tanzania), Greater Virunga Landscape (Uganda), Muller Schwaner and Arabela Landscape & West Papua Landscape (Indonesia), Central Annamites Landscape (Laos), Ayerwady Landscape (Myanmar), Terai Arc Landscape & Mountain Landscape (Nepal), and Itenez Landscape (Bolivia).

ORGANISATION/UNIT	NUMBER OF INFORMANTS
Techno Environment Co Ltd (Tanzania)	1
In-country consultations, Tanzania	
Embassy of Finland, Dar es Salaam	1
FAO Tanzania	1
Forest and Beekeeping Division (FBD) of the Ministry of Natural Resources and Tourism	1
FORLAND	1
Ministry of Industry and Trade and Investment	1
Mpingo conservation Development Initiatives (MCDI)	1
National Carbon Monitoring Centre	1
President's Office Regional Administration and Local Government (PO RALG), Economic and Productive Sector	1
Sokoine University of Agriculture, Department of Ecosystems and Conservation	1
Tanzania Forest Service (TFS)	1
Tanzania Forestry Research Institute (TAFORI)	2
Vice President's Office – Division of Environment	1
WWF Tanzania	1
In-country consultations, Vietnam	
FORMIS technical assistance team	2
ActionAid Vietnam	2
Department of Forestry and Forest Protection	1
Department of Forestry and Forest Protection, Division of Communications and Database	1
Department of Forestry and Forest Protection, Division of Forest Use and Trade of Forest Products	1
Department of Forestry and Forest Protection, Division of Science, Technology and International Cooperation	1
Embassy of Finland, Hanoi	2
Forest Inventory and Planning Institute	1
Handicraft and Wood Industry Association of Ho Chi Minh City (HAWA)	2
Ministry of Agriculture and Rural Development (MARD)	1
United Nations Development Programme (UNDP)	1

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