

# FTA Revised Phase II Full Proposal: Performance Indicator Matrix (PIM) Tables

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**Table A- CRP Level: Contribution to 2022 CGIAR Targets**

CGIAR Target	Target contribution	Unit of target	Amount Needed (\$)	W1+W2 (%)	W3 (%)	Bilateral (%)	Other (%)	Synergies with other CRP's/ Platforms (click Ctrl for multiple selection)
100 million more farm households have adopted improved varieties, breeds or trees, and / or improved management practices	31.2	million farm households	75,800,000	15	0	85	0	DCLAS, Genebanks, Livestock, Maize, PIM, Rice, Wheat
30 million people, of which 50% are women, assisted to exit poverty	19.1	million people	69,700,000	15	0	85	0	DCLAS, Livestock, Maize, PIM, Rice, RTB, Wheat
Improve the rate of yield increase for major food staples from current <1% to 1.2-1.5% per year	0.1845	%	16,200,000	15	0	85	0	DCLAS, Livestock, Maize, Rice, RTB, Wheat
30 million more people, of which 50% are women, meeting minimum dietary energy requirements	17.2	million people	109,100,000	15	0	85	0	A4NH, DCLAS, Livestock, Maize, PIM, Rice, RTB, Wheat
5% increase in water and nutrient (inorganic, biological) use efficiency in agro-ecosystems, including through recycling and reuse	0.225	%	14,100,000	15	0	85	0	DCLAS, Maize, Rice, RTB, WLE, Wheat
Reduce agriculturally-related greenhouse gas emissions by 0.2 Gt CO <sub>2</sub> -e yr <sup>-1</sup> (5%) compared with business-as-usual scenario in 2022	0.2	Gt CO <sub>2</sub> e/yr	78,800,000	15	0	85	0	CCAFS, PIM, WLE
55 million hectares (ha) degraded land area restored	30	millions of ha	39,400,000	15	0	85	0	DCLAS, PIM, WLE

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CGIAR Target	Target contribution	Unit of target	Amount Needed (\$)	W1+W2 (%)	W3 (%)	Bilateral (%)	Other (%)	Synergies with other CRP's/ Platforms (click Ctrl for multiple selection)
2.5 million ha of forest saved from deforestation	2.5	millions of ha	30,300,000	10	0	90	0	CCAFS
		Total	433,400,000					

## Quantitative contribution to countries

**CGIAR Target:** 100 million more farm households have adopted improved varieties, breeds or trees, and / or improved management practices

CGIAR Target countries	Other Country	Target contribution in country
Ethiopia	–	3.3
Kenya	–	1.5
Uganda	–	0.5
Zambia	–	1.3
OTHER	Côte d'Ivoire	0.8
Rwanda	–	0.3
Mali	–	0.7
Cameroon	–	1.2
DRC	–	1.2
Burkina Faso	–	0.5
Ghana	–	0.5
Mozambique	–	0.8
Tanzania	–	1
OTHER	Indonesia	5.2
Vietnam	–	1.5
OTHER	Lao People's Democratic Republic	0.5
India	–	4.3

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Nepal	–	0.2
OTHER	Brazil	1.5
OTHER	Peru	2
OTHER	Guatemala	0.4
Nicaragua	–	0.4
OTHER	Honduras	0.2
REST OF THE WORLD	–	1.4

**CGIAR Target:** 30 million people, of which 50% are women, assisted to exit poverty

CGIAR Target countries	Other Country	Target contribution in country
Ethiopia	–	1.2
Kenya	–	0.6
Uganda	–	0.2
Zambia	–	0.5
OTHER	Côte d'Ivoire	0.3
Rwanda	–	0.2
Mali	–	0.7
Cameroon	–	1.2
DRC	–	1.2
Burkina Faso	–	0.3
Ghana	–	0.1
Mozambique	–	0.8
Tanzania	–	1
OTHER	Indonesia	4
Vietnam	–	0.6
OTHER	Lao People's Democratic Republic	0.2
India	–	1.3
Nepal	–	0.1
OTHER	Brazil	1.3
OTHER	Peru	2

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OTHER	Guatemala	0.4
Nicaragua	—	0.4
OTHER	Honduras	0.2
REST OF THE WORLD	—	0.3

**CGIAR Target:** Improve the rate of yield increase for major food staples from current <1% to 1.2-1.5% per year

CGIAR Target countries	Other Country	Target contribution in country
Ethiopia	—	0.036
Kenya	—	0.018
Uganda	—	0.007
Mali	—	0.013
Burkina Faso	—	0.009
Tanzania	—	0.018
Vietnam	—	0.011
India	—	0.036
REST OF THE WORLD	—	0.036

**CGIAR Target:** 30 million more people, of which 50% are women, meeting minimum dietary energy requirements

CGIAR Target countries	Other Country	Target contribution in country
Ethiopia	–	1.2
Kenya	–	0.6
Uganda	–	0.2
Zambia	–	0.5
OTHER	Côte d'Ivoire	0.3
Rwanda	–	0.2
Mali	–	0.2
Cameroon	–	1.2
DRC	–	1.2
Burkina Faso	–	0.3
Ghana	–	0.1
Mozambique	–	0.8
Tanzania	–	1
OTHER	Indonesia	4
India	–	1.3
Nepal	–	0.1
OTHER	Peru	2
OTHER	Guatemala	0.4
Nicaragua	–	0.4
OTHER	Honduras	0.2
REST OF THE WORLD	–	0.3

**CGIAR Target:** 5% increase in water and nutrient (inorganic, biological) use efficiency in agro-ecosystems, including through recycling and reuse

CGIAR Target countries	Other Country	Target contribution in country
Ethiopia	—	0.055
Kenya	—	0.037
Uganda	—	0.007
OTHER	Côte d'Ivoire	0.011
Rwanda	—	0.007
Mali	—	0.013
Burkina Faso	—	0.009
Tanzania	—	0.018
OTHER	Indonesia	0.006
Vietnam	—	0.011
India	—	0.037
OTHER	Brazil	0.004
OTHER	Peru	0.009

**CGIAR Target:** Reduce agriculturally-related greenhouse gas emissions by 0.2 Gt CO<sub>2</sub>-e yr<sup>-1</sup> (5%) compared with business-as-usual scenario in 2022

CGIAR Target countries	Other Country	Target contribution in country
Cameroon	—	0.01
DRC	—	0.02
OTHER	Indonesia	0.08
Vietnam	—	0.02
OTHER	Brazil	0.03
OTHER	Peru	0.04

**CGIAR Target:** 55 million hectares (ha) degraded land area restored

CGIAR Target countries	Other Country	Target contribution in country
Ethiopia	—	3
Kenya	—	2
Uganda	—	0.5
Zambia	—	2
Rwanda	—	0.5
Mali	—	0.3
Cameroon	—	0.5
DRC	—	1
Burkina Faso	—	0.5
Ghana	—	0.2
Mozambique	—	0.5
Tanzania	—	0.2
OTHER	Indonesia	8
OTHER	China	0.4
India	—	3
OTHER	Brazil	2
OTHER	Peru	1
OTHER	Guatemala	0.5
Nicaragua	—	0.5
OTHER	Honduras	0.5
OTHER	Colombia	0.3
OTHER	Costa Rica	0.3
OTHER	Liberia	0.3
OTHER	Mexico	2

**CGIAR Target:** 2.5 million ha of forest saved from deforestation

CGIAR Target countries	Other Country	Target contribution in country
Cameroon	—	0.3
DRC	—	0.3
OTHER	Indonesia	0.7
OTHER	Brazil	0.7
OTHER	Peru	0.5

## FP1-Tree Genetic Resources for production and resilience

**PIM Table B: Flagship level: outcomes by windows of funding**

2022 outcome description	Amount needed (\$)	W1+W2 (%)	W3 (%)	Bilateral (%)	Other (%)	W1+W2 (Amount)	W3 (Amount)	Bilateral (Amount)	Other (Amount)
Managers and policy makers adopt effective monitoring methods, tools and practices to mitigate threats to valuable tree genetic resources, and implement suitable safeguarding strategies in line with international initiatives, such as the Global Plan of Action for Forest Genetic Resources and the Global Strategy on Conservation and Use of Cacao Genetic Resources	25,933,333	16	0	84	0	4,149,333	0	21,784,000	0
Agricultural and horticultural research partners adopt cost-effective domestication approaches for priority tree species, based on impacts and maximizing efficiency, and considering trade-offs involved in intensification	25,933,333	16	0	84	0	4,149,333	0	21,784,000	0
National governments, extension services and private partners adopt cost-effective and equitable tree planting material delivery pipelines, with appropriate decision-support tools, to supply high quality site-appropriate tree planting material to smallholders and other growers	25,933,334	16	0	84	0	4,149,333	0	21,784,001	0
	77,800,000					12,448,000	0	65,352,000	0

**PIM Table C: Flagship level: investments by sub-IDO's**

Sub-IDO	Amount needed (\$)	W1+W2 (%)	W3 (%)	Bilateral (%)	Other (%)	W1+W2 (Amount)	W3 (Amount)	Bilateral (Amount)	Other (Amount)
Increased conservation and use of genetic resources	7,770,000	16	0	84	0	1,243,200	0	6,526,800	0
Enhanced conservation of habitats and resources	4,620,000	16	0	84	0	739,200	0	3,880,800	0
Enrichment of plant and animal biodiversity for multiple goods and services	3,159,000	16	0	84	0	505,440	0	2,653,560	0
Enhanced genetic gains	7,669,000	16	0	84	0	1,227,040	0	6,441,960	0
Increased access to diverse nutrient-rich foods	3,159,000	16	0	84	0	505,440	0	2,653,560	0
More productive and equitable management of natural resources	2,369,000	16	0	84	0	379,040	0	1,989,960	0
Enhanced adaptive capacity to climate risks	2,370,000	16	0	84	0	379,200	0	1,990,800	0
More efficient use of inputs	7,670,000	16	0	84	0	1,227,200	0	6,442,800	0
Increased access to productive assets, incl. natural resources	3,950,000	16	0	84	0	632,000	0	3,318,000	0
Increased genetic diversity of agricultural and associated landscapes	3,950,000	16	0	84	0	632,000	0	3,318,000	0
Improved forecasting of impacts of climate change and targeted technology development	3,890,000	16	0	84	0	622,400	0	3,267,600	0
Enhanced capacity to deal with climatic risks and extremes	3,890,000	16	0	84	0	622,400	0	3,267,600	0

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Sub-IDO	Amount needed (\$)	W1+W2 (%)	W3 (%)	Bilateral (%)	Other (%)	W1+W2 (Amount)	W3 (Amount)	Bilateral (Amount)	Other (Amount)
Technologies that reduce women's labor and energy expenditure developed and disseminated	3,889,000	16	0	84	0	622,240	0	3,266,760	0
Improved capacity of women and young people to participate in decision-making	3,889,000	16	0	84	0	622,240	0	3,266,760	0
Increased capacity of beneficiaries to adopt research outputs	3,889,000	16	0	84	0	622,240	0	3,266,760	0
Conducive agricultural policy environment	3,889,000	16	0	84	0	622,240	0	3,266,760	0
Enhanced institutional capacity of partner research organizations	3,889,000	16	0	84	0	622,240	0	3,266,760	0
Increased capacity for innovation in partner development organizations and in poor and vulnerable communities	3,889,000	16	0	84	0	622,240	0	3,266,760	0
	77,800,000					12,448,000	0	65,352,000	0

**PIM Table D: Flagship level: annual milestones table**

Year	Milestone description	Means of verifying	For which outcomes
2021	1.1.1. Effective and affordable methods and decision-support tools, including status and threat assessment maps and appropriate option value methods for the prioritization of safeguarding actions, which consider TGR availability and the value of genetic diversity for products and ecosystem services	Progress reports and other wise implied by nature of milestone	FP1. Cluster 1. Managers and policy makers adopt effective monitoring methods, tools and practices to mitigate threats to valuable tree genetic resources, and implement suitable safeguarding strategies in line with international initiatives, such as the Global Plan of Action for Forest Genetic Resources and the Global Strategy on Conservation and Use of Cacao Genetic Resources
2019	1.1.2. nationally and regionally endorsed actions plans and networks for TGR safeguarding	Progress reports and other wise implied by nature of milestone	FP1. Cluster 1. Managers and policy makers adopt effective monitoring methods, tools and practices to mitigate threats to valuable tree genetic resources, and implement suitable safeguarding strategies in line with international initiatives, such as the Global Plan of Action for Forest Genetic Resources and the Global Strategy on Conservation and Use of Cacao Genetic Resources
2020	1.1.3. user-friendly characterization methods and indicators with practical guidelines for their application in monitoring the status and trends of TGR and associated threats, with case study applications	Progress reports and other wise implied by nature of milestone	FP1. Cluster 1. Managers and policy makers adopt effective monitoring methods, tools and practices to mitigate threats to valuable tree genetic resources, and implement suitable safeguarding strategies in line with international initiatives, such as the Global Plan of Action for Forest Genetic Resources and the Global Strategy on Conservation and Use of Cacao Genetic Resources

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Year	Milestone description	Means of verifying	For which outcomes
2017	1.1.4. a. case studies on the utility/limitations of access and benefit sharing (ABS) in supporting the characterization of TGR and in safeguarding activities and	Progress reports and other wise implied by nature of milestone	FP1. Cluster 1. Managers and policy makers adopt effective monitoring methods, tools and practices to mitigate threats to valuable tree genetic resources, and implement suitable safeguarding strategies in line with international initiatives, such as the Global Plan of Action for Forest Genetic Resources and the Global Strategy on Conservation and Use of Cacao Genetic Resources
2022	1.1.4. b. case studies on the utility/limitations of access and benefit sharing (ABS) in supporting the characterization of TGR and in safeguarding activities and	Progress reports and other wise implied by nature of milestone	FP1. Cluster 1. Managers and policy makers adopt effective monitoring methods, tools and practices to mitigate threats to valuable tree genetic resources, and implement suitable safeguarding strategies in line with international initiatives, such as the Global Plan of Action for Forest Genetic Resources and the Global Strategy on Conservation and Use of Cacao Genetic Resources
2017	1.1.5. a. policy briefs, reward systems, strategies and guidelines for appropriate targeting and safeguarding of TGR in various political, socioeconomic and environmental contexts, at different scales, and based on the biology of the species concerned.	Progress reports and other wise implied by nature of milestone	FP1. Cluster 1. Managers and policy makers adopt effective monitoring methods, tools and practices to mitigate threats to valuable tree genetic resources, and implement suitable safeguarding strategies in line with international initiatives, such as the Global Plan of Action for Forest Genetic Resources and the Global Strategy on Conservation and Use of Cacao Genetic Resources

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Year	Milestone description	Means of verifying	For which outcomes
2022	1.1.5.b. policy briefs, reward systems, strategies and guidelines for appropriate targeting and safeguarding of TGR in various political, socioeconomic and environmental contexts, at different scales, and based on the biology of the species concerned.	Progress reports and other wise implied by nature of milestone	FP1. Cluster 1. Managers and policy makers adopt effective monitoring methods, tools and practices to mitigate threats to valuable tree genetic resources, and implement suitable safeguarding strategies in line with international initiatives, such as the Global Plan of Action for Forest Genetic Resources and the Global Strategy on Conservation and Use of Cacao Genetic Resources
2018	1.2.1. Dynamic (producer- and consumer-sensitive) lists of priority tree species for domestication, with key traits for production, including those that support positive agroecosystem interactions, identified	Progress reports and other wise implied by nature of milestone	FP1. Cluster 2. Agricultural and horticultural research partners adopt cost-effective domestication approaches for priority tree species, based on impacts and maximising efficiency, and considering tradoffs involved in intensification
2019	1.2.2. gender-responsive guidelines, and decision-support and practical tools, for tree domestication	Progress reports and other wise implied by nature of milestone	FP1. Cluster 2. Agricultural and horticultural research partners adopt cost-effective domestication approaches for priority tree species, based on impacts and maximising efficiency, and considering tradoffs involved in intensification
2017	1.2.3. public-“private consortia engaged in tree domestication	Progress reports and other wise implied by nature of milestone	FP1. Cluster 2. Agricultural and horticultural research partners adopt cost-effective domestication approaches for priority tree species, based on impacts and maximising efficiency, and considering tradoffs involved in intensification

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Year	Milestone description	Means of verifying	For which outcomes
2022	1.2.4. improved 'varieties' of priority tree foods and for other tree products, with value visible for growers in comparative demonstration plots/trials	Progress reports and other wise implied by nature of milestone	FP1. Cluster 2. Agricultural and horticultural research partners adopt cost-effective domestication approaches for priority tree species, based on impacts and maximising efficiency, and considering tradoffs involved in intensification
2017	1.2.5. genetic resources mobilized through the genotyping of appropriately assembled germplasm collections, combined with public databases	Progress reports and other wise implied by nature of milestone	FP1. Cluster 2. Agricultural and horticultural research partners adopt cost-effective domestication approaches for priority tree species, based on impacts and maximising efficiency, and considering tradoffs involved in intensification
2020	1.2.6. appropriate ABS models for farmer-developed tree varieties	Progress reports and other wise implied by nature of milestone	FP1. Cluster 2. Agricultural and horticultural research partners adopt cost-effective domestication approaches for priority tree species, based on impacts and maximising efficiency, and considering tradoffs involved in intensification
2017	1.3.1. Delivery pipeline models for tree-planting material that support different users (including for landscape restoration)	Progress reports and other wise implied by nature of milestone	FP1. Cluster 3. National governments, extension services and private partners adopt cost-effective and equitable tree planting material delivery pipelines, with appropriate decision-support tools, to supply high quality site-appropriate tree planting material to smallholders and other growers

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Year	Milestone description	Means of verifying	For which outcomes
2019	1.3.2. Community-based and entrepreneurial production and delivery enterprises e.g. seed orchards, rural resources centers, private tree nurseries, etc.	Progress reports and other wise implied by nature of milestone	FP1. Cluster 3. National governments, extension services and private partners adopt cost-effective and equitable tree planting material delivery pipelines, with appropriate decision-support tools, to supply high quality site-appropriate tree planting material to smallholders and other growers
2018	1.3.3. Quality standards developed and promoted to actors in the germplasm production and delivery sector	Progress reports and other wise implied by nature of milestone	FP1. Cluster 3. National governments, extension services and private partners adopt cost-effective and equitable tree planting material delivery pipelines, with appropriate decision-support tools, to supply high quality site-appropriate tree planting material to smallholders and other growers
2020	1.3.4. Measures to ensure that appropriate quality standards are mainstreamed by policy makers, extension services and the private sector	Progress reports and other wise implied by nature of milestone	FP1. Cluster 3. National governments, extension services and private partners adopt cost-effective and equitable tree planting material delivery pipelines, with appropriate decision-support tools, to supply high quality site-appropriate tree planting material to smallholders and other growers
2021	1.3.5. User-friendly decision-support tools to inform planting choices where relevant in conjunction with market information services	Progress reports and other wise implied by nature of milestone	FP1. Cluster 3. National governments, extension services and private partners adopt cost-effective and equitable tree planting material delivery pipelines, with appropriate decision-support tools, to supply high quality site-appropriate tree planting material to smallholders and other growers

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Year	Milestone description	Means of verifying	For which outcomes
2018	1.3.6. Indicators to monitor delivery pathways (relate to models)	Progress reports and other wise implied by nature of milestone	FP1. Cluster 3. National governments, extension services and private partners adopt cost-effective and equitable tree planting material delivery pipelines, with appropriate decision-support tools, to supply high quality site-appropriate tree planting material to smallholders and other growers
2020	1.3.7. Indicators to monitor performance and viability (survival) (relate to standards) of planting	Progress reports and other wise implied by nature of milestone	FP1. Cluster 3. National governments, extension services and private partners adopt cost-effective and equitable tree planting material delivery pipelines, with appropriate decision-support tools, to supply high quality site-appropriate tree planting material to smallholders and other growers
2022	1.3.8. Indicators to evaluate quality and the needs for management (including enrichment) of natural regeneration (Formulation, testing and use of indicators)	Progress reports and other wise implied by nature of milestone	FP1. Cluster 3. National governments, extension services and private partners adopt cost-effective and equitable tree planting material delivery pipelines, with appropriate decision-support tools, to supply high quality site-appropriate tree planting material to smallholders and other growers

## FP2-Enhancing trees and forest contribution to smallholder livelihoods

**PIM Table B: Flagship level: outcomes by windows of funding**

2022 outcome description	Amount needed (\$)	W1+W2 (%)	W3 (%)	Bilateral (%)	Other (%)	W1+W2 (Amount)	W3 (Amount)	Bilateral (Amount)	Other (Amount)
Improved food security and livelihood opportunities for 100 million people in smallholder households and more productive and equitable management of natural resources over an area of at least 50 million ha. This outcome integrates some outputs from other research clusters through their scaling.	27,200,000	12	0	88	0	3,264,000	0	23,936,000	0
Improved livelihood opportunities involving timber, fruit and NTFPs contributing a 25% increase in income for over 5 million people and more equitable management of natural resources including a 25% increase in women's participation in decisions involving tree and forest management and utilization and improvement in substantive representation of women in community forest management institutions	16,300,000	12	0	88	0	1,956,000	0	14,344,000	0
Diversified tree-crop production systems covering 5 million ha and improving diets and livelihood opportunities for 20 million people in smallholder producer households	21,800,000	12	0	88	0	2,616,000	0	19,184,000	0

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2022 outcome description	Amount needed (\$)	W1+W2 (%)	W3 (%)	Bilateral (%)	Other (%)	W1+W2 (Amount)	W3 (Amount)	Bilateral (Amount)	Other (Amount)
Increased access to diverse, nutrient rich food for 20 million people through closing yield gaps by trees in agricultural systems improving and maintaining soil health as well as intensifying system interactions (fodder and firewood) and directly contributing to production, reducing and reversing land degradation and increasing the resilience of smallholder livelihoods	27,200,000	12	0	88	0	3,264,000	0	23,936,000	0
Closing yield gaps through improved pasture management and animal husbandry on over 15 million ha and 1 million animals and contributes to reducing and reversing land degradation on over 5 million ha	16,300,000	12	0	88	0	1,956,000	0	14,344,000	0
	108,800,000					13,056,000	0	95,744,000	0

**PIM Table C: Flagship level: investments by sub-IDO's**

Sub-IDO	Amount needed (\$)	W1+W2 (%)	W3 (%)	Bilateral (%)	Other (%)	W1+W2 (Amount)	W3 (Amount)	Bilateral (Amount)	Other (Amount)
Increased livelihood opportunities	16,300,000	12	0	88	0	1,956,000	0	14,344,000	0
Increased value capture by producers	7,600,000	12	0	88	0	912,000	0	6,688,000	0
Increased access to diverse nutrient-rich foods	10,900,000	12	0	88	0	1,308,000	0	9,592,000	0
Land, water and forest degradation minimized and reversed	10,900,000	12	0	88	0	1,308,000	0	9,592,000	0
More productive and equitable management of natural resources	10,900,000	12	0	88	0	1,308,000	0	9,592,000	0
Agricultural systems diversified and intensified in ways that protect soils and water	13,100,000	12	0	88	0	1,572,000	0	11,528,000	0
Increased resilience of agro-ecosystems and communities, especially those including smallholders	6,500,000	12	0	88	0	780,000	0	5,720,000	0
Gender-equitable control of productive assets and resources	10,900,000	12	0	88	0	1,308,000	0	9,592,000	0
Conducive agricultural policy environment	10,900,000	12	0	88	0	1,308,000	0	9,592,000	0
Increased capacity for innovation in partner research organizations	5,400,000	12	0	88	0	648,000	0	4,752,000	0
Increased capacity for innovation in partner development organizations and in poor and vulnerable communities	5,400,000	12	0	88	0	648,000	0	4,752,000	0
	108,800,000					13,056,000	0	95,744,000	0

**PIM Table D: Flagship level: annual milestones table**

Year	Milestone description	Means of verifying	For which outcomes
2017	Comparative analysis of local knowledge, gender roles and policy options across at least three countries and regions	Journal articles, comparative datasets and knowledge bases mounted on dataverse	Outcome 2.1 improved food security and livelihood opportunities for 100 million people in smallholder households and more productive and equitable management of natural resources over an area of at least 50 million ha. This outcome integrates some outputs from other research clusters through their scaling.
2018	Livelihood system models and predictions of impact from better use of tree resources for at least five countries in Africa, Asia and Latin America	Journal articles, model library for each country and region mounted on community of practice platforms	Outcome 2.1 improved food security and livelihood opportunities for 100 million people in smallholder households and more productive and equitable management of natural resources over an area of at least 50 million ha. This outcome integrates some outputs from other research clusters through their scaling.
2019	Negotiation support tools influencing the management of ecosystem service provision bridging field and farm level land use decisions with local landscape impacts in at least three African countries	Journal articles, documentation of negotiation support activity and outcomes on community of practice platforms	Outcome 2.1 improved food security and livelihood opportunities for 100 million people in smallholder households and more productive and equitable management of natural resources over an area of at least 50 million ha. This outcome integrates some outputs from other research clusters through their scaling.
2020	Impact analyses of the establishment of co-learning communities of practice in terms of effecting sustainable intensification for at least three countries in Africa, Asia and Latin America	Journal articles, working paper comprising the impact analyses and lessons learnt from them	Outcome 2.1 improved food security and livelihood opportunities for 100 million people in smallholder households and more productive and equitable management of natural resources over an area of at least 50 million ha. This outcome integrates some outputs from other research clusters through their scaling.

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Year	Milestone description	Means of verifying	For which outcomes
2021	Generalized understanding of how contextual variables affect suitability of tree-based options to improve smallholder livelihoods across large scaling domains in Africa, Asia and Latin America	Journal articles	Outcome 2.1 improved food security and livelihood opportunities for 100 million people in smallholder households and more productive and equitable management of natural resources over an area of at least 50 million ha. This outcome integrates some outputs from other research clusters through their scaling.
2022	Self-sustaining communities of practice operating co-learning approaches in development work across large scaling domains in 12 countries, delivering livelihood improvements	Community of practice platforms including dashboard indicators of livelihood outcomes	Outcome 2.1 improved food security and livelihood opportunities for 100 million people in smallholder households and more productive and equitable management of natural resources over an area of at least 50 million ha. This outcome integrates some outputs from other research clusters through their scaling.
2017	Analysis of barriers to people benefiting from tree resources across at least six countries and three regions	Journal articles	Outcome 2.2 improved livelihood opportunities involving timber, fruit and NTFPs contributing a 25% increase in income for over 5 million people and more equitable management of natural resources including a 25% increase in women's participation in decisions involving tree and forest management and utilization and improvement in substantive representation of women in community forest management institutions
2018	Impacts of forest policy on socially and economically differentiated groups of actors collated across at least six countries and three regions	Working paper and journal articles comparative database on dataverse.	Outcome 2.2 improved livelihood opportunities involving timber, fruit and NTFPs contributing a 25% increase in income for over 5 million people and more equitable management of natural resources including a 25% increase in women's participation in decisions involving tree and forest management and utilization and improvement in substantive representation of women in community forest management institutions

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Year	Milestone description	Means of verifying	For which outcomes
2019	Comparative analysis of different approaches to establishing value chain innovation platforms for at least two countries in Africa	Working paper and journal articles comparative database on dataverse.	Outcome 2.2 improved livelihood opportunities involving timber, fruit and NTFPs contributing a 25% increase in income for over 5 million people and more equitable management of natural resources including a 25% increase in women's participation in decisions involving tree and forest management and utilization and improvement in substantive representation of women in community forest management institutions
2020	Quantification of tree and forest contributions to livelihood improvement across at least six countries and three regions	Six datasets on dataverse	Outcome 2.2 improved livelihood opportunities involving timber, fruit and NTFPs contributing a 25% increase in income for over 5 million people and more equitable management of natural resources including a 25% increase in women's participation in decisions involving tree and forest management and utilization and improvement in substantive representation of women in community forest management institutions
2021	Analysis of institutional arrangements for financing sustainable intensification and marketing products with specific reference to opportunities for women and young people	Journal articles and working papers	Outcome 2.2 improved livelihood opportunities involving timber, fruit and NTFPs contributing a 25% increase in income for over 5 million people and more equitable management of natural resources including a 25% increase in women's participation in decisions involving tree and forest management and utilization and improvement in substantive representation of women in community forest management institutions

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Year	Milestone description	Means of verifying	For which outcomes
2022	Value adding options promoted and taken up for timber, fruit and other NTFPs within communities of practice customising options to ecological conditions and livelihood circumstances in at least nine countries in three regions	Documented uptake of value adding options in nine community of practice platforms	Outcome 2.2 improved livelihood opportunities involving timber, fruit and NTFPs contributing a 25% increase in income for over 5 million people and more equitable management of natural resources including a 25% increase in women's participation in decisions involving tree and forest management and utilization and improvement in substantive representation of women in community forest management institutions
2017	Options by context matrices for diversified cocoa and oilpalm production practices in Peru and Brazil	Matrices mounted on dataverse, journal articles.	Outcome 2.3 diversified tree-crop production systems covering 5 million ha and improving diets and livelihood opportunities for 20 million people in smallholder producer households
2018	Options for managing intensive rubber production systems in environmentally sustainable ways in China	Journal articles	Outcome 2.3 diversified tree-crop production systems covering 5 million ha and improving diets and livelihood opportunities for 20 million people in smallholder producer households
2019	Options for closing coffee yield gaps across different contexts in East Africa and Indonesia	Journal articles	Outcome 2.3 diversified tree-crop production systems covering 5 million ha and improving diets and livelihood opportunities for 20 million people in smallholder producer households
2020	A global system for recommending fertilizer application for cocoa in relation to site types and management regimes	System mounted on accessible website	Outcome 2.3 diversified tree-crop production systems covering 5 million ha and improving diets and livelihood opportunities for 20 million people in smallholder producer households
2021	Diversified coffee production practices that confer adaptability to climate change in key coffee growing regions (Africa, Asia and Latin America)	Journal articles. Disaggregated trends in coffee production in relation to climate (USDA Global Agricultural Information Network).	Outcome 2.3 diversified tree-crop production systems covering 5 million ha and improving diets and livelihood opportunities for 20 million people in smallholder producer households

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Year	Milestone description	Means of verifying	For which outcomes
2022	Tree-crop commodity system intervention options promoted and taken up within communities of practice customising options to ecological conditions and livelihood circumstances of smallholders in at least five countries in three regions.	Documented uptake of system intervention options in five community of practice platforms	Outcome 2.3 diversified tree-crop production systems covering 5 million ha and improving diets and livelihood opportunities for 20 million people in smallholder producer households
2017	Globally calibrated tree-crop interaction models that can reliably predict impacts of tree cover change on yields of at least three staple crops	Journal articles	Outcome 2.4 increased access to diverse, nutrient rich food for 20 million people through closing yield gaps by trees in agricultural systems improving and maintaining soil health as well as intensifying system interactions (fodder and firewood) and directly contributing to production, reducing and reversing land degradation and increasing the resilience of smallholder livelihoods
2018	Governance models required to reconcile free grazing of animals with tree regeneration across sub-saharan Africa evaluated	Working paper, journal articles	Outcome 2.4 increased access to diverse, nutrient rich food for 20 million people through closing yield gaps by trees in agricultural systems improving and maintaining soil health as well as intensifying system interactions (fodder and firewood) and directly contributing to production, reducing and reversing land degradation and increasing the resilience of smallholder livelihoods
2019	Simulation models of impacts of trees on system intensification of smallholder production systems	Simile models mounted and running on accesible website, input datasets and output prediction mounted on dataverse	Outcome 2.4 increased access to diverse, nutrient rich food for 20 million people through closing yield gaps by trees in agricultural systems improving and maintaining soil health as well as intensifying system interactions (fodder and firewood) and directly contributing to production, reducing and reversing land degradation and increasing the resilience of smallholder livelihoods

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Year	Milestone description	Means of verifying	For which outcomes
2020	Tree-species specific effects on functional profiles of soil micro-organisms	Journal articles, datasets on dataverse	Outcome 2.4 increased access to diverse, nutrient rich food for 20 million people through closing yield gaps by trees in agricultural systems improving and maintaining soil health as well as intensifying system interactions (fodder and firewood) and directly contributing to production, reducing and reversing land degradation and increasing the resilience of smallholder livelihoods
2021	A system for determining threshold levels of tree density and diversity required to maintain long term soil health	System mounted on accesible website	Outcome 2.4 increased access to diverse, nutrient rich food for 20 million people through closing yield gaps by trees in agricultural systems improving and maintaining soil health as well as intensifying system interactions (fodder and firewood) and directly contributing to production, reducing and reversing land degradation and increasing the resilience of smallholder livelihoods
2022	Options for integrating trees in crop fields and farming landscapes promoted and taken up within communities of practice customising options to ecological conditions and livelihood circumstances of smallholders in at least ten countries in three regions.	Documented uptake of options for integrating trees in ten community of practice platforms	Outcome 2.4 increased access to diverse, nutrient rich food for 20 million people through closing yield gaps by trees in agricultural systems improving and maintaining soil health as well as intensifying system interactions (fodder and firewood) and directly contributing to production, reducing and reversing land degradation and increasing the resilience of smallholder livelihoods
2017	Global systematic review of relationships between tree cover and pasture and animal productivity	Review record on CEE (Collaboration for Environment Evidence) internet library.	Outcome 2.5 closing yield gaps through improved pasture management and animal husbandry on over 15 million ha and 1 million animals and contributes to reducing and reversing land degradation on over 5 million ha

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Year	Milestone description	Means of verifying	For which outcomes
2018	Synthesis of productivity and other ecosystem service benefits of trees on pastures and current approaches to their valuation and payments for them	Journal articles	Outcome 2.5 closing yield gaps through improved pasture management and animal husbandry on over 15 million ha and 1 million animals and contributes to reducing and reversing land degradation on over 5 million ha
2019	Tools for selecting tree species for pastures across different contexts	Tools mounted on accessible website and their use documented on community of practice platforms	Outcome 2.5 closing yield gaps through improved pasture management and animal husbandry on over 15 million ha and 1 million animals and contributes to reducing and reversing land degradation on over 5 million ha
2020	Quantitative synthesis of the role of trees in reducing heat stress in cattle and contributing to animal productivity and welfare	Journal article. Dataset on dataverse	Outcome 2.5 closing yield gaps through improved pasture management and animal husbandry on over 15 million ha and 1 million animals and contributes to reducing and reversing land degradation on over 5 million ha
2021	Governance models required to enable sustainable silvopastoral management evaluated in relation to context	Working paper	Outcome 2.5 closing yield gaps through improved pasture management and animal husbandry on over 15 million ha and 1 million animals and contributes to reducing and reversing land degradation on over 5 million ha
2022	Silvopastoral system improvement options promoted and taken up within communities of practice customising options to ecological conditions and livelihood circumstances across Central America and the Sahel.	Documented uptake of silvopastoral improvement options in community of practice platforms in Central America and the Sahel	Outcome 2.5 closing yield gaps through improved pasture management and animal husbandry on over 15 million ha and 1 million animals and contributes to reducing and reversing land degradation on over 5 million ha

## FP3-Sustainable global value chains and investments

**PIM Table B: Flagship level: outcomes by windows of funding**

2022 outcome description	Amount needed (\$)	W1+W2 (%)	W3 (%)	Bilateral (%)	Other (%)	W1+W2 (Amount)	W3 (Amount)	Bilateral (Amount)	Other (Amount)
Public and private actors adopt effective governance arrangements, mechanisms and tools for ensuring sustainable, inclusive, equitable commodity supply in at least three countries	33,000,000	15	0	85	0	4,950,000	0	28,050,000	0
Five business platforms and 20 businesses and service providers develop and implement business models that are more inclusive, economically viable and environmentally sustainable	26,000,000	15	0	85	0	3,900,000	0	22,100,000	0
At least 30% of financial service providers lending to timber, tree and agricultural crops adopt ESG criteria, and increase in 25% the lending to models that integrate smallholders and SMEs	24,000,000	15	0	85	0	3,600,000	0	20,400,000	0
	83,000,000					12,450,000	0	70,550,000	0

**PIM Table C: Flagship level: investments by sub-IDO's**

Sub-IDO	Amount needed (\$)	W1+W2 (%)	W3 (%)	Bilateral (%)	Other (%)	W1+W2 (Amount)	W3 (Amount)	Bilateral (Amount)	Other (Amount)
Improved access to financial and other services	15,500,000	15	0	85	0	2,325,000	0	13,175,000	0
Reduced market barriers	9,400,000	15	0	85	0	1,410,000	0	7,990,000	0
Diversified enterprise opportunities	10,400,000	15	0	85	0	1,560,000	0	8,840,000	0
Increased value capture by producers	13,500,000	15	0	85	0	2,025,000	0	11,475,000	0
Land, water and forest degradation minimized and reversed	19,900,000	15	0	85	0	2,985,000	0	16,915,000	0
Gender-equitable control of productive assets and resources	4,200,000	15	0	85	0	630,000	0	3,570,000	0
Increased capacity for innovation in partner development organizations and in poor and vulnerable communities	10,100,000	15	0	85	0	1,515,000	0	8,585,000	0
	83,000,000					12,450,000	0	70,550,000	0

**PIM Table D: Flagship level: annual milestones table**

Year	Milestone description	Means of verifying	For which outcomes
2017	Key stakeholders are engaged in an impact assessment of voluntary standard systems and private commitments to sustainability for select commodities in at least three major producer countries	Minutes from meetings with stakeholders / published analytical framework for the assessment of voluntary system standards / blog on the the potential and opportunities of voluntary system standards	Public and private actors adopt effective governance arrangements, mechanisms and tools for ensuring sustainable and inclusive commodity supply in at least 3 major producer countries
2018	Completed a comparative assessment of the implementation gaps, challenges and opportunities in sustainable value chain governance with analysis social, economic and environmental impacts (based on key select indicators) in at least three major producer countries	Paper assessing implementation gaps / challenges and opportunities in value chaing governance in at least three producer countries / blogs with analysis of implementation challenges, risks and opportunities of private commitments to sustainability / minutes from meetings with key state agencies in select countries, and representatives from private sector and business platforms	Public and private actors adopt effective governance arrangements, mechanisms and tools for ensuring sustainable and inclusive commodity supply in at least 3 major producer countries
2019	Completed guidelines on innovative solutions for addressing implementation gaps to improving sustainability and social outcomes through changes in incentive structures, supply chain management, and business processes	Published guidelines / paper on innovative solutions for supporting policy and business practices changes in support to sustainability, blogs, minutes from meetings with key state agencies and business platforms / reports from national and global roundtables and certification processes	Public and private actors adopt effective governance arrangements, mechanisms and tools for ensuring sustainable and inclusive commodity supply in at least 3 major producer countries

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2020	Key sustainability initiatives at the international and national level informed by tools and guidelines to adjust interventions at the value chain and jurisdictional level across at least five select commodities in three countries	Policy briefs with recommendations from research findings / blogs and other media material / progress reports of sustainability initiatives / company and NGOs websites assessing companies' performance	Public and private actors adopt effective governance arrangements, mechanisms and tools for ensuring sustainable and inclusive commodity supply in at least 3 major producer countries
2021	Available a decision support tool based on a comparative analysis of select cases of costs, benefits and trade-offs of improved natural forest management practices vis-À-vis planted forests and tree crops, and strengthened capacities for co-developing the most appropriate practices and models	Published article with analysis of costs benefits and trade-offs of improved natural forest management / published articles on costs and benefits of different practices of planted forests and tree crops / blogs summarizing main research findings / minutes from meetings with state agencies and rural producer association	Public and private actors adopt effective governance arrangements, mechanisms and tools for ensuring sustainable and inclusive commodity supply in at least 3 major producer countries
2022	Completed guidelines and tools on the most promising public-private institutional arrangements, for achieving sustainability that combine state and privately-driven interventions with governments, private sector associations and business platforms informed in at least 3 major producer countries	Published articles with analysis of promising public-private institutional arrangements / infobrief with a summary of research findings / blogs and other media material / progress reports of sustainability initiatives / company and NGOs websites assessing companies' performance	Public and private actors adopt effective governance arrangements, mechanisms and tools for ensuring sustainable and inclusive commodity supply in at least 3 major producer countries

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2017	Data collection and analysis of costs and performance of business models across at least four sectors involving major high-value tree crops, and disseminated outcomes in five business platforms with key recommendations for improving practices	Paper on the socio-environmental performance of business models across three select high-value tree crop sectors / infobrief and blog with a summary of main reserach findings / meeting with representatives of private sector associations / presentations in conferences and business platforms	5 business platforms and 20 businesses and service providers develop and implement business models that are more inclusive, economically viable and environmentally sustainable
2018	Key stakeholders in the private sector are informed about the socio-environmental performance of value chain and business models across at least three business platforms and 10 businesses and service providers	Datasets with available data on case studies / produced blogs and media material for dissemination of major outcomes / mintues from meetings with working groups at business platforms and select businesses	5 business platforms and 20 businesses and service providers develop and implement business models that are more inclusive, economically viable and environmentally sustainable
2019	Completed guidelines for overcoming institutional and operational barriers and obstacles faced by businesses in integrating smallholders into their operations and respective value chains in at least four high-value tree crops	Paper assessing institutional and operational barriers and obstacles faced by businesses in integrating smallholders / infobrief with main research findings / blog and other media material / minutes from meetings with business platforms, businesses and state agencies supporting smallhodlers and SMEs	5 business platforms and 20 businesses and service providers develop and implement business models that are more inclusive, economically viable and environmentally sustainable
2020	Finalized a typology of business models for timber and tree crop commodities, based on their economic, environmental, social performance and related trade-offs, looking across situations in four high-value tree crops	Paper with a typology of business models for timber and tree crop commodities / infobrief with main reserach lessons / blogs and other media material	5 business platforms and 20 businesses and service providers develop and implement business models that are more inclusive, economically viable and environmentally sustainable

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2021	3 business platforms and 10 businesses informed on best practice guidelines, tools and metrics for the design, implementation and assessment of business models that are more socially inclusive, economically viable, environmentally sustainable and have the potential to produce greater impact at scale	Policy papers with main recommendations on practices, guidelines, tools and metrics for the design of business models / minutes from meetings with business platforms / minutes from meetings with businesses / annual reports from select business platforms and select businesses informed by our research / reports from NGOs / webpages from platforms and businesses	5 business platforms and 20 businesses and service providers develop and implement business models that are more inclusive, economically viable and environmentally sustainable
2022	5 business platforms and 20 businesses informed on best practice guidelines, tools and metrics for the design, implementation and assessment of business models that are more socially inclusive, economically viable, environmentally sustainable and have the potential to produce greater impact at scale	Policy papers with main recommendations on practices, guidelines, tools and metrics for the design of business models / minutes from meetings with business platforms / minutes from meetings with businesses / annual reports from select business platforms and select businesses informed by our research / reports from NGOs / webpages from platforms and businesses	5 business platforms and 20 businesses and service providers develop and implement business models that are more inclusive, economically viable and environmentally sustainable
2017	Completed analysis of innovative financial mechanisms in support to expanding access to finance to smallholders and SMEs in timber and tree-crop value chains	Paper comparing potential of innovative financial mechanisms to support smallholders and SMEs / infobrief and blog with summary of main research findings / minutes and proceeding of participation in specialized conferences	At least 30% of financial service providers lending to timber, tree and agricultural crops adopt ESG criteria, and increase in 25% the lending to models that integrate smallholders and SMEs
2018	Finalized a review of the scope and implementation mechanisms of ESG integration strategies for different types of FSPs products and services with recommendations for improving design into critical areas	Paper with analysis of ESG integration strategies by financial service providers / infobrief and blogs summarizing main research findings / reports of financial service providers / minutes from meetings in specialized finance platforms	At least 30% of financial service providers lending to timber, tree and agricultural crops adopt ESG criteria, and increase in 25% the lending to models that integrate smallholders and SMEs

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2019	Completed analysis of the potential to more explicitly integrate ESG finance to smallholders and SMEs finance with cases and recommendations for moving forward in at least three countries with emphasis in timber and tree-crop sectors	Policy papers with recommendations on linking ESG finance to smallholder and SMEs finance / minutes from attendance to specialized fora and conferences / minutes from participation in key responsible finance platforms / websites of financial institutions and NGOs assessing progress	At least 30% of financial service providers lending to timber, tree and agricultural crops adopt ESG criteria, and increase in 25% the lending to models that integrate smallholders and SMEs
2020	Available metrics and tools that enable FSPs to better evaluate the social and environmental performance of their financial portfolios	Policy papers with metrics and tools for better evaluating performance of financial service providers' portfolios / minutes from attendance to specialized fora and conferences / minutes from participation in key responsible finance platforms / websites of financial institutions	At least 30% of financial service providers lending to timber, tree and agricultural crops adopt ESG criteria, and increase in 25% the lending to models that integrate smallholders and SMEs
2021	Assessment of financial mechanisms providing improved access of finance to smallholders and SMEs with evaluation of their livelihoods and land use impacts	Policy papers with recommendations on financial schemes improving smallholder and SMEs access to finance / minutes from attendance to specialized fora and conferences / minutes from participation in key responsible finance platforms / websites of financial institutions	At least 30% of financial service providers lending to timber, tree and agricultural crops adopt ESG criteria, and increase in 25% the lending to models that integrate smallholders and SMEs
2022	Financial service providers informed on options to improve design of their products and services in support to smallholder and SMEs with improved impacts in enhancing livelihoods while supporting adoption of sustainability practices	Progress reports of responsible finance / websites of financial institutions / reports from NGOs assessing progress / minutes from meetings with financial service providers / recommendations from specialized conferences	At least 30% of financial service providers lending to timber, tree and agricultural crops adopt ESG criteria, and increase in 25% the lending to models that integrate smallholders and SMEs

## FP4-Landscape Dynamics, productivity and resilience

**PIM Table B: Flagship level: outcomes by windows of funding**

2022 outcome description	Amount needed (\$)	W1+W2 (%)	W3 (%)	Bilateral (%)	Other (%)	W1+W2 (Amount)	W3 (Amount)	Bilateral (Amount)	Other (Amount)
(Sub)national governance systems in at least 10 countries use contextualized theories of change to guide transitions to integral achievement of sustainable development goals through restoration, conservation and management of landscape multi-functionality, using similarity domains based on patterns and intensities of forest and tree cover change in space and time in sentinel landscapes understood on the basis of 'drivers' that operate at larger scales.	23,100,000	11	0	89	0	2,541,000	0	20,559,000	0
(Sub)national governance systems in landscapes covering 100 M ha and inhabited by 70 M people use quantified and valued functions of FT&A for biodiversity, full hydrological cycle and ecosystem services analyzed across knowledge domains and available for policy-level synthesis and planning.	34,700,000	11	0	89	0	3,817,000	0	30,883,000	0

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2022 outcome description	Amount needed (\$)	W1+W2 (%)	W3 (%)	Bilateral (%)	Other (%)	W1+W2 (Amount)	W3 (Amount)	Bilateral (Amount)	Other (Amount)
Diverse diets from tree cover in mosaic landscapes recognized and enhanced as contributions to balanced diets through increase of availability, and access to, nutrient-rich wild and cultivated food products from these landscapes (10 sentinel landscapes 10 M people)	23,100,000	11	0	89	0	2,541,000	0	20,559,000	0
Adaptive landscape institutions empowered and supported on 6 M ha inhabited by 4 M people to manage changing landscape mosaics towards more balanced and adaptive multifunctionality and successful 'forest landscape restoration' through 'action research' and inclusive, participatory learning. This is aligned with efforts in PIM.5.2 -æ6 million hectares of shared landscapes under more productive and equitable management.	34,700,000	11	0	89	0	3,817,000	0	30,883,000	0
	115,600,000					12,716,000	0	102,884,000	0

**PIM Table C: Flagship level: investments by sub-IDO's**

Sub-IDO	Amount needed (\$)	W1+W2 (%)	W3 (%)	Bilateral (%)	Other (%)	W1+W2 (Amount)	W3 (Amount)	Bilateral (Amount)	Other (Amount)
Increased livelihood opportunities	14,450,000	11	0	89	0	1,589,500	0	12,860,500	0
Increased access to productive assets, incl. natural resources	11,560,000	11	0	89	0	1,271,600	0	10,288,400	0
Gender-equitable control of productive assets and resources	6,936,000	11	0	89	0	762,960	0	6,173,040	0
Increased access to diverse nutrient-rich foods	11,560,000	11	0	89	0	1,271,600	0	10,288,400	0
Enhanced institutional capacity of partner research organizations	10,404,000	11	0	89	0	1,144,440	0	9,259,560	0
Land, water and forest degradation minimized and reversed	28,900,000	11	0	89	0	3,179,000	0	25,721,000	0
Improved capacity of women and young people to participate in decision-making	12,716,000	11	0	89	0	1,398,760	0	11,317,240	0
Increased resilience of agro-ecosystems and communities, especially those including smallholders	15,606,000	11	0	89	0	1,716,660	0	13,889,340	0
Improved water quality	3,468,000	11	0	89	0	381,480	0	3,086,520	0
	115,600,000					12,716,000	0	102,884,000	0

**PIM Table D: Flagship level: annual milestones table**

Year	Milestone description	Means of verifying	For which outcomes
2017	<p>Identified similarities at tier 1 and 2 level connected to 10 tier-3 sentinel landscape data sets , used as basis for planned impact studies of interventions across all FTA FP's, and linked with the SDG perfor-mance planning and monitoring in at least 10 countries. Decision support tools for selection of approaches (natural regeneration or planting), species and seed sources for sustainable restoration of forests adopted within three countries to meet their Bonn Challenge pledges.</p>	<p>1) Website availability of spatially explicit open-access data sets on conditions and trends of forest and tree cover change linked to liveli-hood opportunities 2) Development plans of local governments and sup-porting agencies tht utilize FTA results 3) Process studies docu-menting and critically analyzing degrees of participation (incl. gender and youth representatives) in planning processes</p>	<p>Outcome 4.1 (Sub)national governance systems in at least 10 countries use contextualized theories of change to guide transitions to integral achievement of sustainable development goals through restoration, conservation and management of landscape multi-functionality, using similarity domains based on patterns and intensities of forest and tree cover change in space and time in sentinel landscapes understood on the basis of 'drivers' that operate at larger scales.</p>
2018	<p>Adjustments to portfolio of sentinel landscapes for round-2 characterization based on explicit account of represen-tativeness for wider domains, track record of connecting results to local development planning (local governments and external supporting agencies) and interventions balancing livelihood opportunities and reversal of land degradation and deforestation. Decision support tools for prioritizing sites and defining objectives for restoration of forests, at the landscape and local scale, tested and adopted in three priority countries.</p>	<p>1) Website availability of spatially explicit open-access data sets on conditions and trends of forest and tree cover change linked to liveli-hood opportunities 2) Development plans of local governments and sup-porting agencies tht utilize FTA results 3) Process studies docu-menting and critically analyzing degrees of participation (incl. gender and youth representatives) in planning processes</p>	<p>Outcome 4.1 (Sub)national governance systems in at least 10 countries use contextualized theories of change to guide transitions to integral achievement of sustainable development goals through restoration, conservation and management of landscape multi-functionality, using similarity domains based on patterns and intensities of forest and tree cover change in space and time in sentinel landscapes understood on the basis of 'drivers' that operate at larger scales.</p>

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2019	Second round surveys of conditions and trends in at least 10 sentinel landscapes, tailoring surveys to the integral SDG portfolio and its internal tradeoffs, with strong roles for local partners	1) Website availability of spatially explicit open-access data sets on conditions and trends of forest and tree cover change linked to livelihood opportunities 2) Development plans of local governments and supporting agencies that utilize FTA results 3) Process studies documenting and critically analyzing degrees of participation (incl. gender and youth representatives) in planning processes	Outcome 4.1 (Sub)national governance systems in at least 10 countries use contextualized theories of change to guide transitions to integral achievement of sustainable development goals through restoration, conservation and management of landscape multi-functionality, using similarity domains based on patterns and intensities of forest and tree cover change in space and time in sentinel landscapes understood on the basis of 'drivers' that operate at larger scales.
2020	Second round surveys of conditions and trends in sentinel landscapes completed, changes documented, interpreted, and linked to national SDG reporting systems.	1) Website availability of spatially explicit open-access data sets on conditions and trends of forest and tree cover change linked to livelihood opportunities 2) Development plans of local governments and supporting agencies that utilize FTA results 3) Process studies documenting and critically analyzing degrees of participation (incl. gender and youth representatives) in planning processes	Outcome 4.1 (Sub)national governance systems in at least 10 countries use contextualized theories of change to guide transitions to integral achievement of sustainable development goals through restoration, conservation and management of landscape multi-functionality, using similarity domains based on patterns and intensities of forest and tree cover change in space and time in sentinel landscapes understood on the basis of 'drivers' that operate at larger scales.

2021	Scenario studies and participatory development planning results for at least 10 sentinel land-scapes that make use of rounds 1 + 2 results, aligned with national goals and international commitments (incl. Aichi targets of CBD, UNCCD and UNFCCC modalities)	1) Website availability of spatially explicit open-access data sets on conditions and trends of forest and tree cover change linked to livelihood opportunities 2) Development plans of local governments and supporting agencies that utilize FTA results 3) Process studies documenting and critically analyzing degrees of participation (incl. gender and youth representatives) in planning processes	Outcome 4.1 (Sub)national governance systems in at least 10 countries use contextualized theories of change to guide transitions to integral achievement of sustainable development goals through restoration, conservation and management of landscape multi-functionality, using similarity domains based on patterns and intensities of forest and tree cover change in space and time in sentinel landscapes understood on the basis of 'drivers' that operate at larger scales.
2022	Use of FTA research results in evaluation of SDG performance and adjustments to the goals and means of implementation. Countries in Africa, Latin America and Asia, guided by FTA-informed practices and policies, successfully establish on degraded land millions of ha of self-sustaining forest that benefit local communities.	1) Website availability of spatially explicit open-access data sets on conditions and trends of forest and tree cover change linked to livelihood opportunities 2) Development plans of local governments and supporting agencies that utilize FTA results 3) Process studies documenting and critically analyzing degrees of participation (incl. gender and youth representatives) in planning processes	Outcome 4.1 (Sub)national governance systems in at least 10 countries use contextualized theories of change to guide transitions to integral achievement of sustainable development goals through restoration, conservation and management of landscape multi-functionality, using similarity domains based on patterns and intensities of forest and tree cover change in space and time in sentinel landscapes understood on the basis of 'drivers' that operate at larger scales.
2017	Assessment of effects of tree cover change on rainfall patterns and variability at continental scales, combining global circulation models with qualified tree cover data, quantified water balance data, dendrochronological evidence of past change and vulnerability of livelihoods	1) Website availability of studies, process-level and spatially calibrated heuristic models on FT&A ecosystem services at multiple scales 2) Reference to FTA results in global synthesis documents such as IPBES and IPCC	Outcome 4.2 (Sub)national governance systems in landscapes covering 100 M ha and inhabited by 70 M people use quantified and valued functions of FT&A for biodiversity, full hydrological cycle and ecosystem services analyzed across knowledge domains and available for policy-level synthesis and planning.

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2018	Synthesis of options for achieving Aichi targets of biodiversity conservation through managed transition zones around protected areas, landscape connectivity and ecological corridors and development zoning utilizing full spectrum of FT&A land use systems	1) Website availability of studies, process-level and spatially calibrated heuristic models on FT&A ecosystem services at multiple scales 2) Reference to FTA results in global synthesis documents such as IPBES and IPCC	Outcome 4.2 (Sub)national governance systems in landscapes covering 100 M ha and inhabited by 70 M people use quantified and valued functions of FT&A for biodiversity, full hydrological cycle and ecosystem services analyzed across knowledge domains and available for policy-level synthesis and planning.
2019	Valuation studies that relate human and social capital benefits across scales to changes in forest and tree cover as indicators of ecosystem services in local context, as contributions to national and international debate (incl. IPBES)	1) Website availability of studies, process-level and spatially calibrated heuristic models on FT&A ecosystem services at multiple scales 2) Reference to FTA results in global synthesis documents such as IPBES and IPCC	Outcome 4.2 (Sub)national governance systems in landscapes covering 100 M ha and inhabited by 70 M people use quantified and valued functions of FT&A for biodiversity, full hydrological cycle and ecosystem services analyzed across knowledge domains and available for policy-level synthesis and planning.
2020	Reevaluation of cobenefit relations among global conventions (CBD, UNCCD, UNFCCC) at landscape scale, utilized in international discourse	1) Website availability of studies, process-level and spatially calibrated heuristic models on FT&A ecosystem services at multiple scales 2) Reference to FTA results in global synthesis documents such as IPBES and IPCC	Outcome 4.2 (Sub)national governance systems in landscapes covering 100 M ha and inhabited by 70 M people use quantified and valued functions of FT&A for biodiversity, full hydrological cycle and ecosystem services analyzed across knowledge domains and available for policy-level synthesis and planning.
2021	Impact study of shifts in gender-equitable control of productive FT&A assets and resources. Policy options to favor sustainable restoration of tree-based ecosystems adopted by at least 3 countries that have made pledges to meet international agreements	1) Website availability of studies, process-level and spatially calibrated heuristic models on FT&A ecosystem services at multiple scales 2) Reference to FTA results in global synthesis documents such as IPBES and IPCC	Outcome 4.2 (Sub)national governance systems in landscapes covering 100 M ha and inhabited by 70 M people use quantified and valued functions of FT&A for biodiversity, full hydrological cycle and ecosystem services analyzed across knowledge domains and available for policy-level synthesis and planning.

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2022	Re-assessment of new evidence of effects of tree cover change on rainfall patterns and variability at continental scales, combining global circulation models with qualified tree cover data, quantified water balance data and dendrochronological evidence	1) Website availability of studies, process-level and spatially calibrated heuristic models on FT&A ecosystem services at multiple scales 2) Reference to FTA results in global synthesis documents such as IPBES and IPCC	Outcome 4.2 (Sub)national governance systems in landscapes covering 100 M ha and inhabited by 70 M people use quantified and valued functions of FT&A for biodiversity, full hydrological cycle and ecosystem services analyzed across knowledge domains and available for policy-level synthesis and planning.
2017	Stock taking of statistical data sets that link dietary diversity to species-level and genetic diversity of agricultural and associated landscapes and process-level models that interpret this in terms of availability, access and behavioural patterns, setting priorities for further work by FTA and partners	1) National SDG statistics at subnational scale for countries targeted by FTA, with explicit comparators/counterfactuals 2) Website availability of reports, typologies, databases and diagnostic tools, and documented evidence of their use 3) Recognition in high-level policy documents of the relevance of landscape diversity for balanced nutrition (against a baseline of virtual zero before 2015)	Outcome 4.3 Diverse diets from tree cover in mosaic landscapes recognized and enhanced as contributions to balanced diets through Increase of availability, and access to, nutrient-rich wild and cultivated food products from these landscapes (10 sentinel landscapes 10 M people)
2018	Analysis of priorities and options for developing capacities of value chain actors (including input suppliers, producers, processors, retailers and traders) on production, post-harvet handling, processing, marketing and consumption of nutrient-rich foods derived at landscape scale	1) National SDG statistics at subnational scale for countries targeted by FTA, with explicit comparators/counterfactuals 2) Website availability of reports, typologies, databases and diagnostic tools, and documented evidence of their use 3) Recognition in high-level policy documents of the relevance of landscape diversity for balanced nutrition (against a baseline of virtual zero before 2015)	Outcome 4.3 Diverse diets from tree cover in mosaic landscapes recognized and enhanced as contributions to balanced diets through Increase of availability, and access to, nutrient-rich wild and cultivated food products from these landscapes (10 sentinel landscapes 10 M people)

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2019	In at least 5 landscapes: Increased on-farm production of a diversity of fruits, nuts, vegetables and legumes, and increased amount of collected wild resources including wild fruits, vegetables, bush meat, mushrooms, insects and fish from forests	1) National SDG statistics at subnational scale for countries targeted by FTA, with explicit comparators/counterfactuals 2) Website availability of reports, typologies, databases and diagnostic tools, and documented evidence of their use 3) Recognition in high-level policy documents of the relevance of landscape diversity for balanced nutrition (against a baseline of virtual zero before 2015)	Outcome 4.3 Diverse diets from tree cover in mosaic landscapes recognized and enhanced as contributions to balanced diets through Increase of availability, and access to, nutrient-rich wild and cultivated food products from these landscapes (10 sentinel landscapes 10 M people)
2020	In at least 5 countries: Increased value capture by producers/collectors of nutrient-rich food reduced post-harvest losses of wild and cultivated nutrient-rich food increased incomes and employment	1) National SDG statistics at subnational scale for countries targeted by FTA, with explicit comparators/counterfactuals 2) Website availability of reports, typologies, databases and diagnostic tools, and documented evidence of their use 3) Recognition in high-level policy documents of the relevance of landscape diversity for balanced nutrition (against a baseline of virtual zero before 2015)	Outcome 4.3 Diverse diets from tree cover in mosaic landscapes recognized and enhanced as contributions to balanced diets through Increase of availability, and access to, nutrient-rich wild and cultivated food products from these landscapes (10 sentinel landscapes 10 M people)
2021	In at least 5 countries: Increased dietary diversity of low-income rural and urban consumers using a variety of nutrient-rich wild and cultivated nutrient-rich food available during economic, social and/or environmental shocks	1) National SDG statistics at subnational scale for countries targeted by FTA, with explicit comparators/counterfactuals 2) Website availability of reports, typologies, databases and diagnostic tools, and documented evidence of their use 3) Recognition in high-level policy documents of the relevance of landscape diversity for balanced nutrition (against a baseline of virtual zero before 2015)	Outcome 4.3 Diverse diets from tree cover in mosaic landscapes recognized and enhanced as contributions to balanced diets through Increase of availability, and access to, nutrient-rich wild and cultivated food products from these landscapes (10 sentinel landscapes 10 M people)

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2022	Impact study of the effectiveness of interventions by development partners aimed at supporting dietary diversity through diverse landscapes	1) National SDG statistics at subnational scale for countries targeted by FTA, with explicit comparators/counterfactuals 2) Website availability of reports, typologies, databases and diagnostic tools, and documented evidence of their use 3) Recognition in high-level policy documents of the relevance of landscape diversity for balanced nutrition (against a baseline of virtual zero before 2015)	Outcome 4.3 Diverse diets from tree cover in mosaic landscapes recognized and enhanced as contributions to balanced diets through Increase of availability, and access to, nutrient-rich wild and cultivated food products from these landscapes (10 sentinel landscapes 10 M people)
2017	Exchange of lessons learned across the various learning landscapes associated with FTA, including a further review of existing typologies of 'payment for watershed services' settings and as basis for new action research efforts.	1) Website availability of objectives, context and evolving lessons in the various learning landscape networks 2) Publicly available synthesis documents and impact studies 3) Documented use of the typologies that emerge from the learning landscape networks	Outcome 4.4 Adaptive landscape institutions empowered and supported on 6 M ha inhabited by 4 M people to manage changing landscape mosaics towards more balanced and adaptive multifunctionality and successful 'forest landscape restoration' through 'action research' and inclusive, participatory learning. This is aligned with efforts in PIM.5.2 -œ6 million hectares of shared landscapes under more productive and equitable management-œ.
2018	Reflection on the multi-scale character of the 'common but differentiated responsibility' phrase that so far is primarily used at international negotiation tables but that may increase space for local adaptive landscape management.	1) Website availability of objectives, context and evolving lessons in the various learning landscape networks 2) Publicly available synthesis documents and impact studies 3) Documented use of the typologies that emerge from the learning landscape networks	Outcome 4.4 Adaptive landscape institutions empowered and supported on 6 M ha inhabited by 4 M people to manage changing landscape mosaics towards more balanced and adaptive multifunctionality and successful 'forest landscape restoration' through 'action research' and inclusive, participatory learning. This is aligned with efforts in PIM.5.2 -œ6 million hectares of shared landscapes under more productive and equitable management-œ.

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2019	Compilation of lessons learned at landscape scale across the learning landscape networks for reporting on Aichi targets to CBD.	1) Website availability of objectives, context and evolving lessons in the various learning landscape networks 2) Publicly available synthesis documents and impact studies 3) Documented use of the typologies that emerge from the learning landscape networks	Outcome 4.4 Adaptive landscape institutions empowered and supported on 6 M ha inhabited by 4 M people to manage changing landscape mosaics towards more balanced and adaptive multifunctionality and successful 'forest landscape restoration' through 'action research' and inclusive, participatory learning. This is aligned with efforts in PIM.5.2 -œ6 million hectares of shared landscapes under more productive and equitable management-œ.
2020	Impact study of the further development and use of the LUMENS tool for participatory planning of land uses providing multiple environmental services. Cost-effective, multiscale and participatory protocols for monitoring viability of restored forests developed and adopted by key countries and other stakeholders.	1) Website availability of objectives, context and evolving lessons in the various learning landscape networks 2) Publicly available synthesis documents and impact studies 3) Documented use of the typologies that emerge from the learning landscape networks	Outcome 4.4 Adaptive landscape institutions empowered and supported on 6 M ha inhabited by 4 M people to manage changing landscape mosaics towards more balanced and adaptive multifunctionality and successful 'forest landscape restoration' through 'action research' and inclusive, participatory learning. This is aligned with efforts in PIM.5.2 -œ6 million hectares of shared landscapes under more productive and equitable management-œ.
2021	Documented investment action of development support partners on the basis of the shared learning that links issues to places and action perspectives	1) Website availability of objectives, context and evolving lessons in the various learning landscape networks 2) Publicly available synthesis documents and impact studies 3) Documented use of the typologies that emerge from the learning landscape networks	Outcome 4.4 Adaptive landscape institutions empowered and supported on 6 M ha inhabited by 4 M people to manage changing landscape mosaics towards more balanced and adaptive multifunctionality and successful 'forest landscape restoration' through 'action research' and inclusive, participatory learning. This is aligned with efforts in PIM.5.2 -œ6 million hectares of shared landscapes under more productive and equitable management-œ.

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2022	Next-level stock taking of how the 'payment for environmental services' debate has progressed conceptually (combining behavioural economics, applied ecology and institutional political ecology) and in evolving practice.	1) Website availability of objectives, context and evolving lessons in the various learning landscape networks 2) Publicly available synthesis documents and impact studies 3) Documented use of the typologies that emerge from the learning landscape networks	Outcome 4.4 Adaptive landscape institutions empowered and supported on 6 M ha inhabited by 4 M people to manage changing landscape mosaics towards more balanced and adaptive multifunctionality and successful 'forest landscape restoration' through 'action research' and inclusive, participatory learning. This is aligned with efforts in PIM.5.2 -œ6 million hectares of shared landscapes under more productive and equitable management-Œ.
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## FP5-Climate change mitigation/adaptation opportunities in forests&agroforestry

**PIM Table B: Flagship level: outcomes by windows of funding**

2022 outcome description	Amount needed (\$)	W1+W2 (%)	W3 (%)	Bilateral (%)	Other (%)	W1+W2 (Amount)	W3 (Amount)	Bilateral (Amount)	Other (Amount)
Efficient, effective and equitable climate national and international mitigation policies and funding, aligned with development objectives (3E+ goals)	44,000,000	15	0	85	0	6,600,000	0	37,400,000	0
Risk-assessed ecosystem-based adaptation (EbA) policy and practice in place including joint mitigation and adaptation approaches	21,580,000	15	0	85	0	3,237,000	0	18,343,000	0
Integrated food and bioenergy production policy and practice realized	10,360,000	15	0	85	0	1,554,000	0	8,806,000	0
Performance assessment of mitigation and adaptation policy and practice widely implemented	10,360,000	15	0	85	0	1,554,000	0	8,806,000	0
	86,300,000					12,945,000	0	73,355,000	0

**PIM Table C: Flagship level: investments by sub-IDO's**

Sub-IDO	Amount needed (\$)	W1+W2 (%)	W3 (%)	Bilateral (%)	Other (%)	W1+W2 (Amount)	W3 (Amount)	Bilateral (Amount)	Other (Amount)
Reduced net greenhouse gas emissions from agriculture, forests and other forms of land use	38,000,000	15	0	85	0	5,700,000	0	32,300,000	0
Enhanced adaptive capacity to climate risks	23,300,000	15	0	85	0	3,495,000	0	19,805,000	0
Increased livelihood opportunities	10,400,000	15	0	85	0	1,560,000	0	8,840,000	0
Gender-equitable control of productive assets and resources	6,000,000	15	0	85	0	900,000	0	5,100,000	0
Enhanced individual capacity in partner research organizations through training and exchange	8,600,000	15	0	85	0	1,290,000	0	7,310,000	0
	86,300,000					12,945,000	0	73,355,000	0

**PIM Table D: Flagship level: annual milestones table**

Year	Milestone description	Means of verifying	For which outcomes
2017	5.1.1. Comparative analysis of best, 3E+ options for policies and practices for emission reduction concluded and applied by decision makers	scientific publications and policy briefs (FTA and CG center websites) book on the topic national reports and strategy documents, e.g. for REDD+	Efficient, effective and equitable climate national and international mitigation policies and funding, aligned with development objectives (3E+ goals)
2018	5.1.2. Research on forest restoration and enhancing forest carbon sink capacity available and used (e.g. in the Bonn Challenge)	scientific publications and policy briefs (FTA and CG center websites) Bonn Challenge documents and website, country reports	Efficient, effective and equitable climate national and international mitigation policies and funding, aligned with development objectives (3E+ goals)
2019	5.1.3. Analysis of and roadmap for reduced forest fire practice and policies (Indonesia) made available and used by authorities	scientific publications and policy briefs (FTA and CG center websites) Indonesia Peatland Agency documents	Efficient, effective and equitable climate national and international mitigation policies and funding, aligned with development objectives (3E+ goals)
2020	5.1.4. Analysis available to increase effectiveness and efficiency of results-based climate finance and used (e.g. by Green Climate Fund)	Policy briefs documentation of stakeholder dialogues, GCF strategy documents and work logics	Efficient, effective and equitable climate national and international mitigation policies and funding, aligned with development objectives (3E+ goals)
2021	5.1.5. Options for enabling policy architecture and public-private partnership mechanisms defined and used to shape corporate zero-deforestation commitments	scientific publications and policy briefs (FTA and CG center websites) corporate annual reports and similar documents, government and watchdog organization reports on the role of the private sector	Efficient, effective and equitable climate national and international mitigation policies and funding, aligned with development objectives (3E+ goals)

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Year	Milestone description	Means of verifying	For which outcomes
2022	5.1.6. Evidence-based decision-making in NDC planning and implementation and policy learning from country-level to the international policy arena (Facilitative Dialogue) supported with analysis and data and evident in NDCs	scientific publications and policy briefs (FTA and CG center websites) NDCS submitted by countries, UNFCCC and NGO analysis of NDCs	Efficient, effective and equitable climate national and international mitigation policies and funding, aligned with development objectives (3E+ goals)
2017	5.2.1. Concluding analysis of synergies/trade-offs between mitigation and adaptation published and applied, e.g. in the JMA debate	scientific publications and policy briefs (FTA and CG center websites) UNFCCC documents on Joint Mitigation Adaptation	Risk-assessed ecosystem-based adaptation (EbA) policy and practice in place including joint mitigation and adaptation approaches
2018	5.2.2. Approaches and tools for risk and vulnerability assessment for both people and forests to climate change made available and used, e.g. in the 'loss and damage' debate	scientific publications and policy briefs (FTA and CG center websites) UNFCCC Loss and Damage documents	Risk-assessed ecosystem-based adaptation (EbA) policy and practice in place including joint mitigation and adaptation approaches
2019	5.2.3. Ecosystem-based adaptation (EbA) options that raise adaptive capacity of social groups identified and applied in case studies	scientific publications and policy briefs (FTA and CG center websites) case study reports, e.g. from NGOs, on progress in adaptation	Risk-assessed ecosystem-based adaptation (EbA) policy and practice in place including joint mitigation and adaptation approaches
2020	5.2.4. Mechanisms to strengthen local capacity to respond with EbA comparatively assessed across scales and used in case studies	scientific publications and policy briefs (FTA and CG center websites) case study reports, e.g. from NGOs, on progress in local capacity for adaptation	Risk-assessed ecosystem-based adaptation (EbA) policy and practice in place including joint mitigation and adaptation approaches
2021	5.2.5. Approaches to measure and monitor effectiveness and efficiency of EbA actions developed and tested	scientific publications and policy briefs (FTA and CG center websites) toolboxes available (websites) national adaptation reports that show usage of these tools	Risk-assessed ecosystem-based adaptation (EbA) policy and practice in place including joint mitigation and adaptation approaches

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Year	Milestone description	Means of verifying	For which outcomes
2022	5.2.6. Guidance available for flexible, data-driven approaches as risk reduction strategies and feedback-based policy responses and used in policy making	scientific publications and policy briefs (FTA and CG center websites) analysis report on national policy approaches national reports on adaptation policy and practice	Risk-assessed ecosystem-based adaptation (EbA) policy and practice in place including joint mitigation and adaptation approaches
2017	5.3.1. Analysis of current status of bioenergy types concluded and used by country agencies and international agencies developing bioenergy policies	scientific publications and policy briefs (FTA and CG center websites) country reports, GIZ reports on bioenergy and woodfuel	Integrated food and bioenergy production policy and practice realized
2018	5.3.2. Analysis of international and national drivers of bioenergy development to understand land allocation to bioenergy production concluded and used in national policies	scientific publications and policy briefs (FTA and CG center websites) national reports, case study reports	Integrated food and bioenergy production policy and practice realized
2019	5.3.3. Spatially explicit assessments of potential of bioenergy production on degraded land available and used in climate-smart land allocation to biofuel production	scientific publications and policy briefs (FTA and CG center websites) national and case study reports international analysis reports e.g. by UN agency or NGO	Integrated food and bioenergy production policy and practice realized
2020	5.3.4. Analysis of impact of bioenergy on social and environmental outcomes available to countries and supporting policy making for sustainable bioenergy production	scientific publications and policy briefs (FTA and CG center websites) national reports	Integrated food and bioenergy production policy and practice realized

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Year	Milestone description	Means of verifying	For which outcomes
2021	5.3.5. Studies of demand and supply, costs, social and environmental impacts, carbon footprints and synergies/trade-offs with food production and variation by world region, feedstock types, and scale of bioenergy production available and used in more informed national policy making	scientific publications and policy briefs (FTA and CG center websites) national reports international comparative report	Integrated food and bioenergy production policy and practice realized
2022	5.3.6. Scenarios developed and used in analysis of how bioenergy extraction links to landscape configuration and how future energy developments may affect the role of biofuels	scientific publications and policy briefs (FTA and CG center websites) scenario development tool and results documentation	Integrated food and bioenergy production policy and practice realized
2017	5.4.1. Reference levels determined for a variety of situations and land uses and applied by countries	scientific publications and policy briefs (FTA and CG center websites) IPCC reports, national reports on RLs	Performance assessment of mitigation and adaptation policy and practice widely implemented
2018	5.4.2. Basic research to understand carbon source/sink dynamics to improve regional and global models available for IPCC and used to improve global models	scientific publications and policy briefs (FTA and CG center websites)	Performance assessment of mitigation and adaptation policy and practice widely implemented
2019	5.4.3. Innovative methods available to measure non-carbon benefits and identify causal change and used by countries	scientific publications and policy briefs (FTA and CG center websites) national and international (e.g. UN) reports on SDG achievements	Performance assessment of mitigation and adaptation policy and practice widely implemented
2020	5.4.4. First round of impact assessment of REDD+ policy and practice concluded	scientific publications and policy briefs (FTA and CG center websites) book on the topic	Performance assessment of mitigation and adaptation policy and practice widely implemented

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Year	Milestone description	Means of verifying	For which outcomes
2021	5.4.5. Approaches to cost-efficient, transparent, reliable MMRV developed	scientific publications and policy briefs (FTA and CG center websites) national reports detailing national MRV systems architecture	Performance assessment of mitigation and adaptation policy and practice widely implemented
2022	5.4.6. Coupled bioeconomic modeling to understand emergent properties, complexity and conditions of landscape systems available and involved in decision-making tools	scientific publications and policy briefs (FTA and CG center websites)	Performance assessment of mitigation and adaptation policy and practice widely implemented