

Proposal for the implementation of 500 ha DAF

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Germany – January 2023

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Objectives:

The project is consisting in the implementation/restauration and conversion of 500 ha landscape young secondary fallow land, grass land and unproductive cocoa fields into Dynamic Agroforestry (DAF) fields. The 500 ha implicates the training of up to 500 farmers within 5 years with the possibility of extension.

Direct benefits

1. Diversification of products and income
2. Increase the productivity of the cocoa cultivar without external inputs
3. Skilled certified DAF farmers
4. Afforestation of degraded landscapes
5. Sequestration of Carbon
6. Reduction of soil erosion
7. Increase of soil fertility
8. Increase of water retention within the soil and system
9. Diversification of income for farmers

Methodology

The approach of the DAF learning process is mainly practical. The concept is passed on in a practical and theoretical way. Through workshops, the learning process will be constantly passed on in a dynamic way. Farmers will be trained as lead farmers.

A standard design, will be elaborated with the farmers, and used in all installations.

Trainings

The lead farmers, will be trained in the following topics:

1. Establishment of DAF fields
2. Management steps of DAF fields
3. Cocoa pruning and grafting
4. Tree pruning

Proposed Organizational Operations

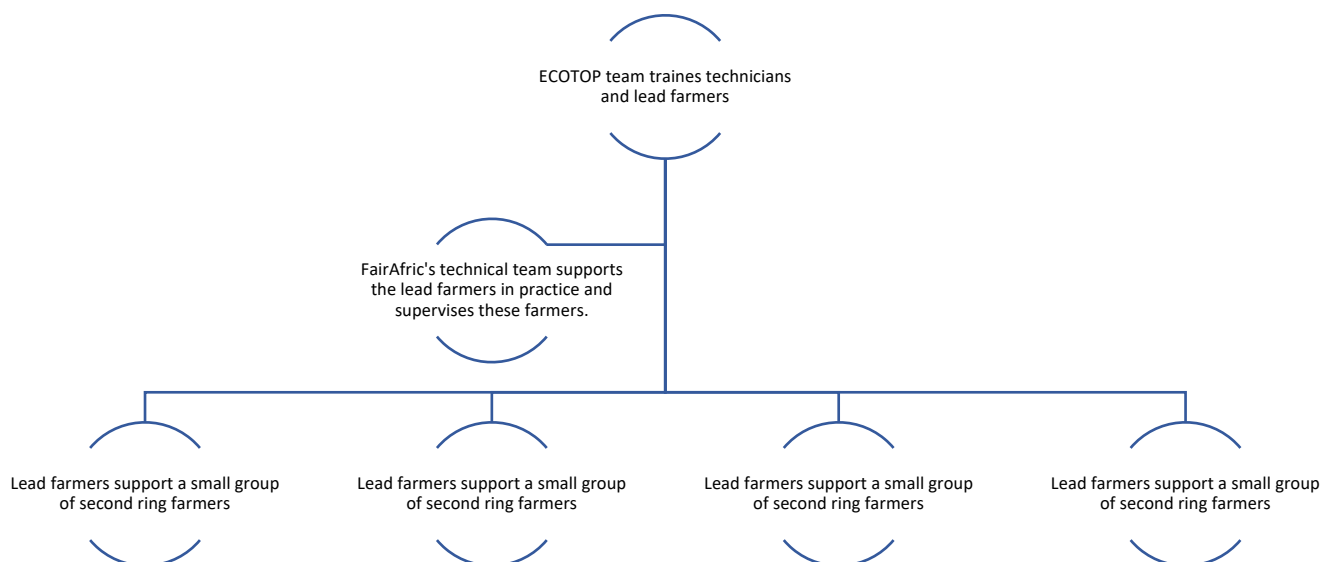


Figure 1: Graphical description of organization

Expected Results

By the end of the project the technical staff and lead farmers are sufficiently skilled to provide technical assistance to other farmers.

Direct results

- 500 ha of DAF installed
- 500 Farmers directly benefit from the project (skilled and autonomically fit to continue)
- Sequestration of CO2 of 500 ha certified

Carbon Aspects of Dynamic Agroforestry Systems

Dynamic agroforestry, is a very complex system to measure carbon removals, because it involves planting a wide range of tree species with different growth habits and management options. Dynamic agroforestry is also a new management system in Ghana, which has only been piloted on a small scale since 2016. A Gold Standard Certified project started in 2018. So, there are no local sites yet, that may be observed or used to obtain data on carbon gains, at the stand level. Nor are there any published reports, or data of stand biomass or annual increment available for any of the tree species. Included for reforestation under this project (i.e., secondary data).

The carbon sequestration potential for DAF systems with cocoa are promising.

In the [Sankofa Project](#) in Ghana, 75 000 t CO₂ is calculated to be sequestered in year 30 by 400 ha of implemented DAF systems corresponding to 187,5 t CO₂/ha. Converting 500 ha of unproductive cocoa plantations into DAF could result in up to 93.750 t CO₂.

Depending on the price per ton of CO₂ that can be paid, 500 ha can result in a return of between EUR 1'875'000 (EUR 20 per t/CO₂) and EUR 9'375'000 (EUR 100 per t/CO₂).

CO₂ Sequestration

As a result, the project could be CO₂ certified under certain conditions, which would lead to climate-neutral production. There are several certification bodies and possibilities.

ECOTOP also offers support in CO₂ aspects which, given the conditions, includes the following:

1. CO₂ Project elaboration, assessment of eligibility according to certification schemes
2. Calculation of end of project sequestration (calculated with a 30 years' time frame)
3. Land mapping, recognition of land eligibility according to the CO₂ standards
4. Implementation of project, Data collection

A detailed calculation and description of CO₂ certification for inseting is not considered in this proposal.

Total Estimated Cost and Revenue

Table 1: Table of Costs and Revenue

Material	Units	Total / 1 ha	Costs in EUR* / Unit	Year 1 100 ha	Year 2 100 ha	Year 3 100 ha	Year 4 100 ha	Year 5 100 ha	Total cumulative cost
Timber trees	Seedlings	93	0,2 €	1.860 €	1.860 €	1.860 €	1.860 €	1.860 €	9.300 €
Cocoa seedlings	Seedlings	833	Free Cocoa board	- €	- €	- €	- €	- €	- €
Fruit trees (Not grafted)	Seedlings	139	0,2 €	2.780 €	2.780 €	2.780 €	2.780 €	2.780 €	13.900 €
Palm trees (cocnut, oil palm)	Seedlings	93	1,5 €	13.950 €	13.950 €	13.950 €	13.950 €	13.950 €	69.750 €
Biomass trees	Seedlings	833	0,2 €	16.660 €	16.660 €	16.660 €	16.660 €	16.660 €	83.300 €
Biomass shrubs	Cuttings	3000	Free is recolected and propagated in area	- €	- €	- €	- €	- €	- €
maize	Seeds Kg	16	1,0 €	1.600 €	1.600 €	1.600 €	1.600 €	1.600 €	8.000 €
Pigeon pea	Seeds Kg	10	1,0 €	1.000 €					1.000 €
buch beans (canavalia, buch mucuna cow pea)	Seeds Kg	20	1,5 €	3.000 €					3.000 €
Mix of vegetables	Gr	50	2,0 €	10.000 €					10.000 €
Cassava cuttings	Cuttings	1000	Free Farmer has to provide	- €	- €	- €	- €	- €	- €
Yam	Seeds	833	0,5 €	41.650 €					41.650 €
Banana suckers (Plantain, sweet bananas) in the third year the other 200 ha will provide bulbs for free	Pseudo bulbs	833	0,5 €	41.650 €			- €	- €	41.650 €
Subtotal				134.150 €	36.850 €	36.850 €	36.850 €	36.850 €	281.550 €

Material	Units	Total / 1 ha	Costs in EUR* / Unit	Year 1 100 ha	Year 2 100 ha	Year 3 100 ha	Year 4 100 ha	Year 5 100 ha	Total cumulative cost
Chain saws STIHL 250	10		800,0 €	8.000 €	- €	- €		- €	8.000 €
Pole saws, pruning saw, pruning shear	1 set / Farmer	1	100,0 €	50.000 €	- €	- €		- €	50.000 €
Installation Labour days -Tree felling - Weeding - planting - seeding	labour days	50	10,0 €	50.000 €	50.000 €	50.000 €	50.000 €	50.000 €	250.000 €
Management Labour days	Labour days	20	10,0 €	20.000 €	20.000 €	20.000 €	20.000 €	20.000 €	100.000 €
Harvest and Post harvest Labour days	Labour days	20	10,0 €	20.000 €	20.000 €	20.000 €	20.000 €	20.000 €	100.000 €
Replanting	Labour days	10	10,0 €	10.000 €	10.000 €	10.000 €	10.000 €	10.000 €	50.000 €
Others Logistics	EUR	2	10,0 €	2.000 €	2.000 €	2.000 €	2.000 €	2.000 €	10.000 €
Subtotal				160.000 €	102.000 €	102.000 €	102.000 €	102.000 €	568.000 €
ECOTOP field missions senior consultant	30 Days / Year 1 it reduces over the years	30	800,0 €	24.000 €	24.000 €	24.000 €	20.000 €	12.000 €	104.000 €
ECOTOP field missions junior consultant	50 days / yea 1 it reduces over the years	50	450,0 €	22.500 €	22.500 €	18.000 €	13.500 €	- €	76.500 €
ECOTOP backstopping + reporting	5 Days / Year	5	1.000 €	5.000 €	5.000 €	5.000 €	5.000 €	5.000 €	25.000 €
ECOTOP flights	Up to 4 times a year	4	2.000 €	8.000 €	8.000 €	6.000 €	8.000 €	4.000 €	34.000 €
ECOTOP allowances senior/junior		60	130,0 €	7.800 €	7.800 €	7.800 €	7.800 €	5.200 €	36.400 €
Subtotal				67.300 €	67.300 €	60.800 €	54.300 €	26.200 €	275.900 €

Material	Units	Total / 1 ha	Costs in EUR* / Unit	Year 1 100 ha	Year 2 100 ha	Year 3 100 ha	Year 4 100 ha	Year 5 100 ha	Total cumulative cost
Yields Maize sold locally 0,3 EUR Kg	Kg	800	0,3 €	24.000 €	24.000 €	24.000 €	24.000 €	24.000 €	120.000 €
Yields Beans sold locally 0,5 EUR Kg	Kg	400	0,5 €	20.000 €	20.000 €	20.000 €	20.000 €	20.000 €	100.000 €
Yields Pigeon pea sold locally 0,4 EUR Kg	Kg	400	0,4 €	16.000 €	16.000 €	16.000 €	16.000 €	16.000 €	80.000 €
Bananas sold locally Bunch 1 EUR	Bunch	800	1,0 €	- €	70.000 €	140.000 €	240.000 €	320.000 €	770.000 €
Yields Yam sold locally 0,3 EUR Kg	Kg	3000	0,3 €	90.000 €	90.000 €	90.000 €	90.000 €	90.000 €	450.000 €
Yields Cocoa Kg Very conservative calculation Average 350 Kg and 450 Kg per year sold internationally 2,5 EUR	Kg	350	2,5 €	- €	- €	- €	87.500 €	200.000 €	287.500 €
Fruit Avocado Unities 46 trees 1 ha sold locally 0,3 EUR	Units	800	0,3 €	- €	- €	- €	12.000 €	48.000 €	60.000 €
Subtotal				150.000 €	220.000 €	290.000 €	489.500 €	718.000 €	1.867.500 €
TOTAL COST	1.125.450 €								
Return yields	1.867.500 €								
Net return	742.050 €								

Action Plan for First Year

Table 2: Action Plan of First Year

Action plan per Year Target 100 farmers and 100 ha															
Activity	Description	Result	Labour days	Jan.	Feb.	Mar.	Apr.	Ma.	Jun.	Jul.	Aug.	Sept.	Oct.	Nov.	Dec.
Mission ECOTOP Senior Junior Workshop DAF principles	40 Pre-selected Lead Farmers are trained in the basic principles	Lead Farmers are familiar with the DAF principles	5												
Mission ECOTOP Senior Junior Installation DAF Demo-plot Savanna design, successional islands and classic design	1 ha is installed applying different methods	1 ha is installed and	5												
Lead Farmers select second ring farmers	Lead farmers select 3 second ring farmers in their own village	Each Lead farmer has 3 second ring farmers	5												

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Action Plan

The above action plan, will be more or less repeated every year.

Contribution from Project Side

In order to achieve the proposed results, the following factors need to be considered in the area of project implementation.

- Fifteen (15) Good practically skilled technicians
- Pre-selected open-minded farmers
- Farmers with at least 1 ha of land to convert
- Eligible area to generate CO2 sequestrations