

Tree Plantation Plan for Carbon Sequestration in Hatinh province of Vietnam
Planting Season 2019

Submitted by:

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and

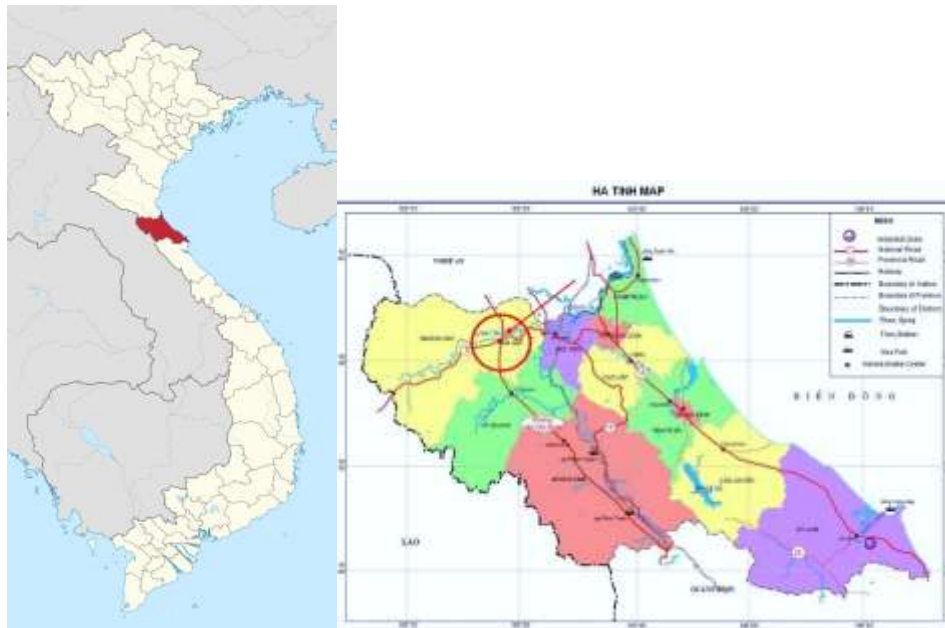
Son Ham Cooperative
Tuong Son village, Son Ham commune, Hatinh province, Vietnam

Submitted to: DFE/Grow-For-It

Why plant trees in Hatinh, Vietnam

The proposed tree planting taken place in Hatinh province situated in central of Vietnam which is 350 km from Hanoi. Locating at the east of Truong Son Mountain Range, Hatinh's terrain is both narrow and sloping, tilting towards the east. A high mountain range towards the west with average height of 1,500m followed by a range of hills, small and narrow elongated plain and coastal sandy banks.

Hatinh with mountainous terrain accounts for 80% of the province's natural area that is sharply differentiated and divided, forming deferent ecological areas. There are 14 rivers such as Ngan Pho, Ngan Sau, Cay, etc. The 137 km coastline is suitable for making salt, rearing shellfish such as shrimps, crabs, oysters, snails etc. Hatinh belongs to the tropical monsoon area with two clear seasons: rainy season lasts from August to November while dry season does from December to July of next year. The weather is dry, hot with highly vaporizing West - Southern wind blowing from Laos and annual average temperature is 23.7°C.



Pic 1. Hatinh on Vietnam map

Pic 2. Planting area on the map of Hatinh

Hatinh Province Farmer Union (Hatinh FU) has more than 100,000 members and branches at province, district, commune and most village levels. The Farmer Union is instrumental in mobilizing farmers and supporting the local cooperatives at the province, district and commune level and thereby acting as local field representatives. Hatinh FU has been representing the local farmers with long experiences in nursery operation, seedling production and tree plantations in and around the working area. Hatinh FU is providing forestry extension service as well as raising awareness among farmers regarding to the importance of tree plantation for land and conservation.



Pic 3. Landscape of Huong Son District

Son Ham cooperative was established in 2015 operating in harvesting, transporting, seedling producing and trading. So far, there are 67 official members engaging in business of the cooperative and contributing capital for operation. Besides that, hundreds of other members seen as secondary members who are mainly using the services of the cooperative only.

Danish Forestry Extension (DFE) - DDS Vietnam has been presented in Vietnam for more than seven years and worked with local Farmer Unions to train farmers to plant and care for their acacia trees. DFE has also helped establishing three local forestry cooperatives which ensure that local farmers can access to seedlings, technical advice and services such as planting and harvesting. In addition, the cooperatives buy and sell the farmer's wood and make sure to negotiate good prices for their members. The cooperatives are in dialogue with local government authorities to ensure access to local support such as permanent land for the cooperative office.



Pic 4. Nursery of Son Ham Cooperative

The farmers often plant 0.5-3 hectares of acacia on their small land plots where they are living and cultivating rice and crops. Trees are planted on degraded farmland or marginal land such as mountain slopes. Tree planting is not only important for controlling erosion, fertilizing land and sequestering CO₂, but also an opportunity for farmers to achieve multiple benefits from the forest as well as to maintain healthy climatic environment in their surroundings. Trees help to diversify the family's income, optimize the land and particularly prevent erosion of mountain slopes. Income from trees are important for farmers as they can afford children's school fees, new agricultural tools or literally be pension savings.

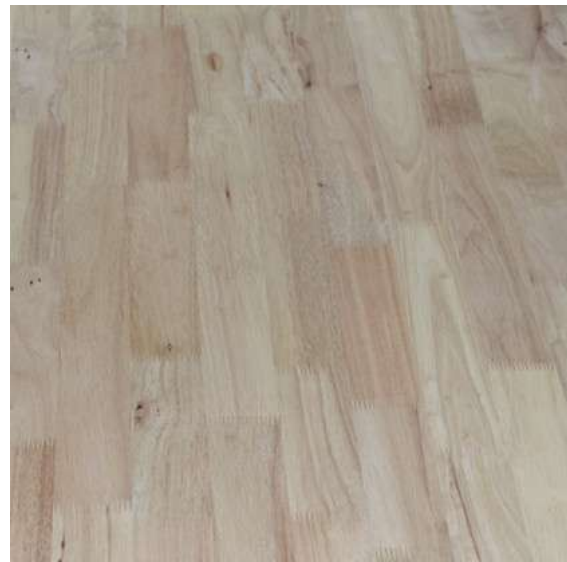
Objectives of the tree plantations

The main objective of the proposed tree plantation concept is to contribute to carbon sequestration through afforestation and reforestation in the selected area, as well as to maintain the remaining forest stand in the area. The tree planting objectives are classified as following:

- To produce commercial wood production and NTFPs to support farmer's livelihoods from the planted trees.
- To contribute to sequestering atmospheric carbon through afforestation/reforestation in the area.
- To reclaim the degraded land through reforestation in upper river basin in the area.

Tree planting models and species

The demand for acacia is increasing and today Vietnam is one of the world's largest exporters of wood chips. Several major furniture manufacturers have production plants in Vietnam and sell furniture to the whole world. Commercial cultivation of acacia trees therefore represents a significant income opportunity for small forest holders. However, most of the farmers lack of access to technical advices, supporting organizations and market knowledge to optimize the yield and outcome for their plantation. Likewise, there is a frequent tendency among farmers to sell trees after only 4-6 years to quickly get the invested money back to pay for household expenses. The farmers' risk tolerance is small because the whole family depend on profits gained from their land. In addition, to strengthen the local income, the small acacia plantations play an important role in counteracting further degradation of the natural forest as they represent local access to wood products and income. In this perspective, acacia can be considered as a long rotational crop that allows farmers to adapt to climate change.



Pic 4. a product of Acacia for export

It is considered to promote three different plantation models addressing on site characteristics, species' characteristics, and CO₂ sequestration potential and farmer's livelihood interest. Farmers proposed the following three different suitable tree planting models with prescribed species. For required number of seedlings, please see annex-2: Seedling inventory sheet attached herewith. The required number of seedlings for plantation will be managed as per inventory sheet.



Pic 5. Measure trees for volume calculation

Model 1. Purpose: Carbon sequestration and upper-basin river management

Designed for 1 ha

No	Indicator	Description	Remark
1	Rotation (years)	8 -10	
2	Spacing (m)	2.0*2.5	
3	Number of seedling	2,000	
↳	<i>Acacia Hybrid V10</i>	1,900	
↳	<i>Chukrasia tabularis</i>	100	Keep longer to the rotation 20 years
4	CO2 Sequestration	To be confirmed later on	
5	Purpose of plantation establishment	Timber and legume N-fixing	

Note: For a start a total of 3.3 ha can be planted with this model

Approx. 2,000 trees are planted per hectare in the first year. These trees are “thinned” regularly to ensure that only the best trees left and they have sufficient space and light to grow big. After 8-10 years, there are about 750 trees left per hectare which will be harvested. From this approx. 50-70% of the wood is sold as a timber e.g. for furniture production. The rest of the trees are used for other purposes as the dimensions are insufficient for timber.

Model 2. Purpose: Carbon sequestration and upper-basin river management

Design for 1 ha

No	Indicator	Description	Remark
1	Rotation (years)	8 -10	
2	Spacing (m)	2.0*2.5	
3	Number of seedling	2,000	
↳	<i>Acacia Hybrid AH 1</i>	1,900	
↳	<i>Chukrasia tabularis</i>	100	Keep longer to the rotation 20 years
4	CO2 Sequestration	To be confirmed later on	
5	Purpose of plantation establishment	Timber and legume N-fixing	

Note: For a start a total of 3.7 ha can be planted with this model

Approx. 2,000 trees are planted per hectare in the first year. These trees are “thinned” regularly to ensure that only the best trees left and they have sufficient space and light to grow big. After 8-10 years, there are about 750 trees left per hectare which will be harvested. From this approx. 50-70% of the wood is sold as a timber e.g. for furniture production. The rest of the trees are used for other purposes as the dimensions are insufficient for timber.

Model 3. Purpose: Carbon sequestration and upper-basin river management

Design for 1 ha

No	Indicator	Description	Remark
1	Rotation (years)	8 -10	
2	Spacing (m)	2.0*2.5	
3	Number of seedling	2,000	
`	<i>Melaleuca leucadendra L.</i>	1,900	
`	<i>Chukrasia tabularis</i>	100	Keep longer to the rotation 20 years
4	CO2 Sequestration	To be confirmed later on	
5	Purpose of plantation establishment	Timber and legume N-fixing	

Note: For a start a total of 8 ha can be planted with this model

Approx. 2,000 trees are planted per hectare in the first year. These trees are “thinned” regularly to ensure that only the best trees left and they have sufficient space and light to grow big. After 8-10 years, there are about 750 trees left per hectare which will be harvested. From this approx. 50-70% of the wood is sold as a timber e.g. for furniture production. The rest of the trees are used for other purposes as the dimensions are insufficient for timber.

Tree planting sites

Tree planting sites were selected in Son Ham commune, Huong Son district, Hatinh province. According to the GPS survey mapping of the allocated land, total of 14.0 ha of land is selected for tree plantation in the year 2019. Tree planting sites and farmers with their commitments were selected as following: For detail please see annex: 2, 3 and 5 for list of the selected farmers with their commitments and site conditions, GPS coordinates and survey maps respectively.

Model 1: 3.7 ha

No	Name of the Farmer	Area (ha.)	Land type (F/S)	Soil Type	Humid (moist, dry)	GPS map No
1.	Tran Xuan Thuan	1.2	S	Humus light clay	Average	7
2.	Nguyen Quoc Thuan	1.2	S	Humus light clay	Average	10
3.	Bui Dinh Thuan	1.3	S	Humus light clay	Average	11
Total		3.7				

Note: F: Flat; S: Slope (=> 10 degree)

Humus light clay: Clay mixed with sand with humus on the top

Model 2: 3.3 ha

No	Name of the Farmer	Area (ha.)	Land type (F/S)	Soil Type	Humid (moist, dry)	GPS map No
1.	Tran Van Binh	1.2	S	Humus light clay	Average	2
2.	Tran Thanh Son	1.1	S	Humus light clay	Average	3
Total		3.3				

Note: F: Flat; S: Slope (=> 10 degree)

Humus light clay: Clay mixed with sand with humus on the top

Model 3: 8 ha

No	Name of the Farmer	Area (ha.)	Land type (F/S)	Soil Type	Humid (moist, dry)	GPS map No
1.	Pham Van Linh	1.0	S	Humus light clay	Average	1
2.	Le Dinh Huyen	1.2	S	Humus light clay	Average	4
3.	Nguyen Van Dong	1.0	S	Humus light clay	Average	5
4.	Nguyen Hong Ngan	1.0	S	Humus light clay	Average	6
5.	Tran Van Tai	1.4	S	Humus light clay	Average	8
6.	Nguyen Van Toan	1.2	S	Humus light clay	Average	9
7.	Nguyen Van Loc	1.2	S	Humus light clay	Average	12
Total		8.0				

Note: F: Flat; S: Slope (=> 10 degree)

Humus light clay: Clay mixed with sand with humus on the top

Calendar of operation (Detail work plan for 2019)

A. Pre-plantation work plan

No	Activities	2019												Remarks
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
1.	Hatinh FU and Son Ham Cooperative planning with farmers: farmers, site selection etc.													
2.	Seedling production													
3.	Agreement with selected farmers entered													
4.	Land clearance, site preparation completed													
5.	Field survey and mapping completed													
6.	Lining in the land and marking													
7.	Planting trees													

B. Post plantation work plan

No	Activities	2019												Remarks	
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec		
1.	Maintaining plantation and update data-base														
2.	Detail of the costs paid year by year														
3.	Weeding of the new plantation														
4.	Supervision														
5.	Survival counting and replanting for 90% survive in minimum														

Strategies applied in tree plantations program

Son Ham cooperative is a local organization located within the selected planting area consisting of an office building with computer facility, motorbikes. There are a forest technician, a finance and administration officer and field facilitators working in 13 communes. Interested members with land available for tree planting activities were selected to plant trees in this scheme according to the following criteria and mutual understanding:

- **Land available**, farmers with more than 1 ha of land are interested in establishing tree plantations on their land.
- **Willing to contribution**, farmers who agreed and committed to bear 20% of the total material and labor cost to plant and maintain on their privately-owned land. The remaining 80% cost will be financed by Son Ham cooperative through DFE/Grow for it from the tree planting scheme
- **Committed people**, farmers who committed to provide maintenance of the planted trees during the rotation period and agreed not to cut the planted trees until the rotation period ends, except general thinning and pruning activities to improve the stand growth to harvest the trees for commercial timber purposes or other socio-economic benefits. Son Ham Cooperative will provide pre- and post-advisory services to farmers during and even after the planting period- till final harvesting (based on the rotation period).
- **Willing to prolong the rotation**, farmers agreed to provide their land and tree planting, maintenance till the rotation period complete. Finally, involved farmers and Son Ham cooperative intend to restock the concerned areas with trees after the completion of the rotation.

Monitoring and Follow up

Son Ham cooperative will develop a basic structure of monitoring and following up the tree plantation and tree growing activities; and provide technical assistance to the tree planting/ tree growing farmers. In order to do this, Son Ham cooperative will immediately form a three member monitoring, supervising and up following committee including one member from Son Ham cooperative and two others among the selected farmers. The supervision and follow-up will focus on seedling procurement and management; pitting and plantation management; plant protection and maintaining plantation database which include: GPS survey for planting area, GPS data records for tree location in excel sheets, name of land holders, planting area, planting layout, name of the tree species, planting year, planting model, photo documentation, seedlings survival/ mortality percentage etc. Besides that, they will

conduct periodical follow up visits and instruct to restock in case of a mortality rate of 10% or above due to extreme weather if observed.

Budget

1. Estimated costs

Total estimated cost for 1 hectare planting area is EURO 1,255. Farmers agree to bear for 20% of labor and material costs. The planting scheme (DFE/Grow for It) will bear for 80% in labor and material costs. As per the costs estimated, the total of EURO 1,003 \approx 1,000 is required to have one hectare plantation excluding farmer's contribution. So, Grow For It/DFE will provide 1,000 EURO per hectare of new tree plot. Please see annex. 7 for details of the costs estimation.

2. Mode of payment

DFE/Grow For It will provide 1,000 EURO per hectare to Son Ham cooperative through DDS Vietnam and Hatinh FU at different levels. Basically 50% will be paid when planning is in place and documented, another 40% will be done after planting taken place and documented. The remaining 10 % will be transferred after 1 year/growing season when 90% planted seedlings survive.

3. Mode of repayment

Farmers sign an agreement with the cooperative to keep the trees on the soil for at least 8 years and allow the cooperative to harvest and sell them when trees are ready for harvesting. As the cooperative is owned by members and works for members' interests, the sale of trees will always be based on consideration of farmer's interests. When the wood is sold, the "80% of investment cost" is deducted from the generated revenue and channeled back to a micro-credit. The farmers get the rest of the profits from the wood sale. Among others this means that:

- There is no direct money "transferred and repaid" between the farmers and the cooperative as it is only the cooperative to receive the donation fund and to pay for 80% of the plantation establishment cost. Thus, no money must be collected by the farmer after harvest as the cooperative also handles harvesting and selling wood then deducting the investment costs from the revenue.
- The farmers only bind few of their resources in the trees and thus can "better afford" to leave the trees longer than usual in the soil. Thereby both the CO2 sequestration and the farmer's economic benefits increase.
- Acacia trees can be replanted in the same area after each harvest (if the farmers wish to) and thus the micro-credit can be "recycled and reused".
- The farmers have an incentive to look after the trees as they have invested their own resources and money in 20% of the establishment costs and repay 80% of the establishment costs to tree planting fund when plantation harvested.