Timber trees and enrichment options in tobacco farms in Santiago, República Dominicana.

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INTRODUCTION

- Deforestation and land uses change have decreased the provision of timber-based products worldwide (Butler 2009, FAO 2009, Grimm *et al*. 2008)
- Timber is widely used in tobacco industry mainly in the processing of tobacco leaves.
- Important to explore opportunity to integrate timber trees on tobacco farms. Agroforestry can be an option.
- We identified the opportunities to integrate timber trees in agricultural lands and tobacco farmers perception on timber tree planting.

METHODOLOGY

- 44 farmers who have land titles participated in the study (Snowball approach).
- This study was carried out in the municipality of Villa González, located in the flat areas in the South of the hills of the Septentrional Mount Range (19°32′N 70°47′O), province of Santiago, República Dominicana (Figure 1).
- In this region around 626 tobacco farms are registered, 7% of them have land titles of their properties. Farm size varied from 0.3 to 3.5 ha.
- Tree inventory on agricultural lands and design of interventions were collected using drawings of the farm features and tree figurines representing the tree species managed/preferred in their farms.
- Two spatial designs and four timber/multipurpose tree species (*Eucalyptus camaldulensis*, *Pinus caribaea*, *Gliricidia sepium* and *Acacia mangium*) were proposed during the design phase based on expert knowledge.
- Information was gathered through participatory focus group.

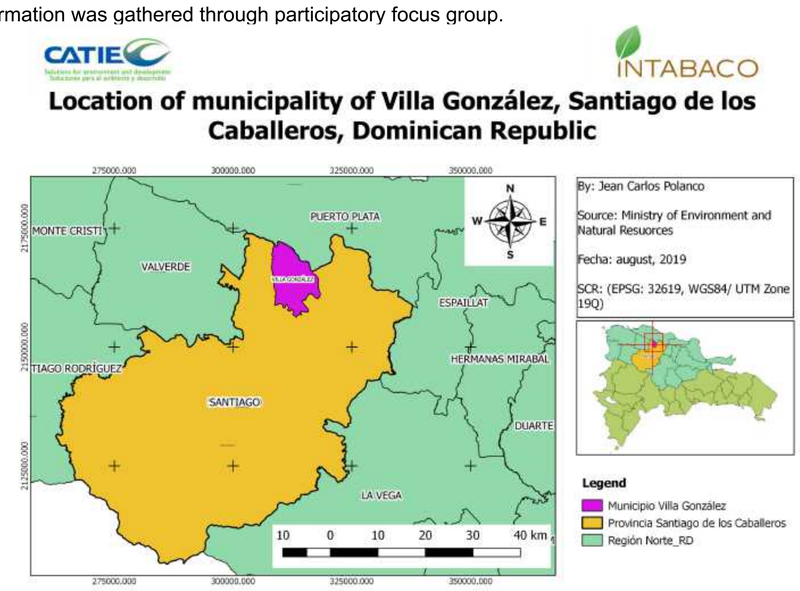

Figure 1. Municipality of Villa González, province of Santiago de los Caballeros, Northern región Dominican Republic. Source: Ministry of Enviroment and Natural Resources.

KEY FINDINGS

1. Tree planting inventory on tobacco farms

- 23% of tobacco farmers have trees in their farms, while 77% mentioned that they managed tobacco as monocrop.
- A total of 368 timber trees were registered on 24.7 ha of agricultural land belonging to five botanical families and 11 species.
- Timber trees were found in linear features (boundaries), woodlots and disperse in the paddock.
- The family with the highest richness and timber tree abundance was *Fabaceae (*5 species and 282 individuals*)*, while the family with the lowest richness and abundance was *Boraginaceae* (one species and 5 individuals) (Table 1).
- More abundant species was *Gliricidia sepium*-Fabaceae (125 individuals) (Table 2).
- Shannon diversity index of tobacco farms was low estimated on 1.80.

Table 1. Family and species richness and tree abundance on tobacco farms

Family	Number of species	Number of trees
Fabaceae	5	182
Meliaceae	3	111
Linaceae	1	50
Myrtaceae	1	20
Boraginaceae	1	5
Total	**11**	**368**

Table 2. Species abundance of the main tree species found on tobacco farms

Species	Number of trees	Family
Gliricidia sepium	125	*Fabaceae*
Azadirachta indica	100	*Meliaceae*
Linum usitatissimum	50	*Linaceae*
Acacia mangium	25	*Fabaceae*
Prosopis juliflora	22	*Fabaceae*
Eucaliptus spp.	20	*Myrtaceae*

Main tree functions that justified tree presence on tobacco farms

According to the interviewee's the main reasons why farmers managed trees on their land were: wood product for farm and home consumption and the establishment of live fences are provision of stakes for breeding purpose.

2. Agroforestry options for enrichment on tobacco farms

- 48% of the farmers showed interest in planting timber trees on their farms while 52% are not willing to plant timber trees.
- Of the 4 species proposed (all non-natives), *Eucalyptus camaldulensis* had the highest rank on preference/acceptance (33% of farmers) whereas *Acacia Mangium* was the species with the lowest acceptance (19%) (Table 4).
- *Eucalyptus camaldulensis* preference was due to the rapid growth of the species, good form and strength.
- *Gliricidia sepium* was the species with the highest acceptance (33%) for linear planting, followed by *E. camaldulensis* and *P. caribaea.* While *Acacia mangium* had the lowest acceptance among tobacco farmers for linear planting (13%).
- *Eucalyptus* camaldulensis was the most preferred species for woodlots with an acceptance of 50%.
- *Pinus caribaea* had the lowest acceptance (17%) as an option for woodlots among tobacco farmers .

Table 3. Species preference for tree planting on tobacco farms

Scientific name	Familiy	% of votes
Eucalyptus camaldulensis	*Myrtaceae*	33%
Pinus caribaea	*Pinaceae*	24%
Gliricidia sepium	*Fabaceae*	24%
Acacia mangium	*Fabaceae*	19%

Underlying factors of success for timber tree growing on tobacco farms

Tobacco farmers mentioned that the most relevant factors to be considered when planting and growing timber trees were (Figure 2):

- Previous knowledge (90% of farmers)
- Current Forest Legislation (90%)
- Availability of information (90%)

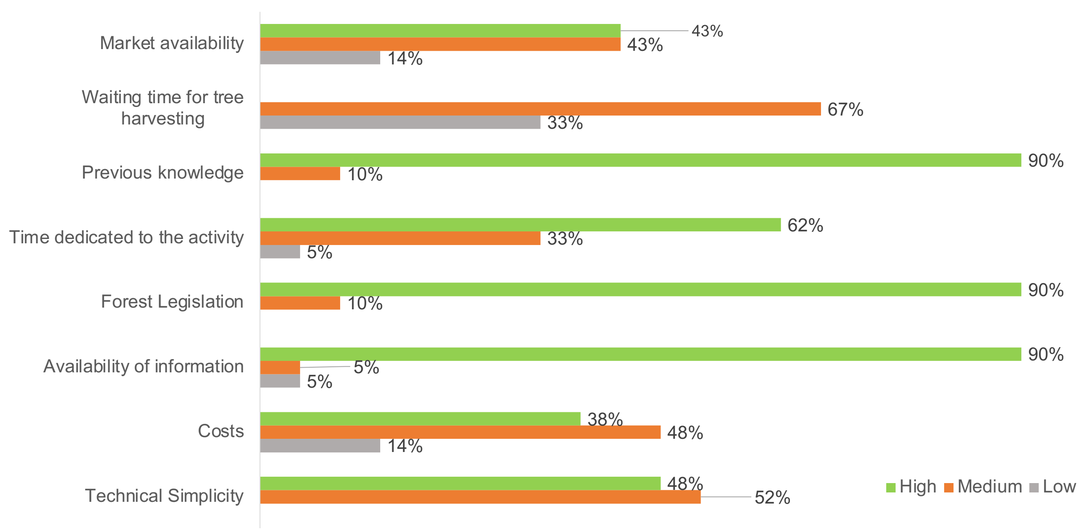

Figure 2.Factors for success for tree growing in agricultural areas mentioned by tobacco farmers.

CONCLUSIONS

- Few farmers have timber trees on their agricultural lands. Around 50% of the farmers showed willingness to integrate trees in their land.
- Previous knowledge about tree planting is a critical factor in the success of the intervention.
- We need to increase the awareness about tree planting among farmers to boost timber tree growing on tobacco farms.
- Here we included only four timber/multipurpose tree species for agroforestry design options. A bigger list of timber tree species available for tree growing needs to be evaluated with farmers, tobacco institute and forestry local department.

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FTA Science Conference 2020