

# Plant Diversity, Ecological Services and Carbon Stock in Cocoa Agroforestry lands with Tetracarpidium conophorum (Müll. Arg.) Hutch. & Dalz. in the Mbam and Inoubou, Cameroon

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## I- Background

• The importance of Wild Edible Fruits (WEF) is widely acknowledge in the Congo Basin especially with tree vines like Tetracarpidium conophorum (Termote et al. 2012, Jiofack et al. 2012);

Income and yields increases the whole year

C sequestration + Ecological services

 Local people from Mbam and Inoubou in Cameroun are involved in the harvesting and marketing of African walnut could be an important source of household

income in rural areas;

- Introduction in cocoa agroforests plantation for diversification needs
- From our investigations, no study exists to map out diversity of species and ecological services derived from carbon stocks sink with T. conophorum in Cameroon



**Fig. 1**: Study site location Adapted from Jiofack et al. (2013)

10 m

100 m

Fig. 2 : Experimental design for inventories

II.2- Carbon stocks sink assessment and Es services Floristic inventories: 9 samples plots of 2000 m2 in each village; using key identification of Vivien and Faure (1985); Wilks and Issembé (2000);

Above ground biomass (AGB) assessment: using methodology of Harriah et al. (2010) in 9 plots of 2000 m2 AGB = Exp (-2.977 + LN (DBH2Hp)); where «p» is wood density and «DBH» is diameter at breast height.

AGF farms selected



Fig. 5 : Floristic records of the five important species according to villages

#### **III.2-Carbon stocks sink and ecological services**

- Mouko (92.03 Mg/ha)
- Rionong (55.18 Mg/ha)

in the Mbam and Inoubou



Fig. 6 : Distribution of species according to class diameter

- Amount of \$3374.6, \$2023.2, and \$1717.1 to the owner of the farms
- Provisional services (diverse products as food, timber, and welfare etc)

CO2/C (44/12) molecular weight to convert carbon stocks (tC/ha) into tCO2/ha and use ratio 10 US\$/tCO2

#### II.3- Data analysis

II.1- Data collection

Structural and diversity parameters were calculated including Excel and SPSS;

Kruskall-wallis test and ANOVA used to compare means.

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Nyamsong 3 (46.83 Mg/ha)

- Carbon sink does not varies with villages (p-value = 0.368 > 0.1)
- Height and diameter (correlated)

 $\cdot$  regulation services (climatic variation, carbon stock assessment etc) • support services (biodiversity conservation, soil fertility etc)

### **IV- Conclusion and perspectives**

Theresting specie for diversification and carbon sink potential (Agroforestry has been recognized as an outstanding practice in agroecology 2019)

The main difficulties: Insufficient informations and technics on transformation, processing and unavailability of good planting materials in some area (Implement Tree domestication)

Further studies are needed to document the age and financial profitability of AGF farms where this liana is introduced for diversification and livelihood improvement







