Analysis of Growth of *Cedrela Odorata* and Three Indigenous Species in a Mixed Plantation in Amama Forest Reserve

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ABSTRACT

Forests in Ghana continue to be degraded at a rapid rate due to over logging, mining, inappropriate methods of farming, bushfires and poor edaphic factors. These degraded lands are now being used productively through reforestation on small scale by private individuals and on large scale by logging companies as conditionality in the acquisition of timber Utilization Contract. Since 2002 the Ayum Forest Products Ltd. has embarked on large scale mixed plantation of indigenous species in the Amama Forest Reserve in the Sunyani Forest District of Brong Ahafo Region within the moist semi-deciduous ecological zone of Ghana. While much is known in Ghana about monoculture plantations of Teak and Eucalyptus since 1971, Knowledge about mixed plantation of exotics and indigenous species particularly the choice of species, their tolerance with others in specific forest reserves where large scale plantation has been established is still in the early stages. This study was conducted in the Ayum Forest Products' mixed plantation in the degraded portion of the Amama Forest Reserve to assess the growth performance of *Cedrela odorata, Ceiba petandra, Terminalia superba* and *Khaya anthortheca* as well as the benefits the communities derived from intercropped maize, plantain and cassava. The effect of food crops on the planted trees seedlings was looked at through Focus Group Discussion and administration of questionnaires with participating farmers. Growth was evaluated in terms of height, diameter, and basal area increment. Plantain provided the best income to participating farmers and appeared indirectly to provide the best positive effect on the growth and survival of the selected timber species by motivating farmers to provide the best cultural practices e.g. regular weeding. Results of the analysis of selected physical and chemical properties of soil sample collected from selected Coupes indicated that there were micro site differences in these parameters such as soil moisture content, Cation Exchange Capacity, texture and soil fertility indicators (Ca, Mg, K). Floral inventory showed that Coupe 2003 contained the highest number (78) of ground floral species compared to the others. It was observed that growth was different particularly on species and coupe basis depending on tolerance level, physiological and morphological adaptations of these species. There were significant

differences in the height, diameter and basal area of the selected species in the selected coupes. Basal area per hectare and mean annual increment per year at age 5 correlated well with light intensity and soil nutrient regime. Coupe2003 which was loamy recorded higher height and diameter increment than the clayey soils. The results obtained in the study may be useful in deriving management strategy that will cope with the rate of reforestation programme being pursued. Farmers were of the view that plantation provided them with the best continuous source of income while income from maize was seasonal. Further research needs to be conducted into the relationship between stand basal soil nutrients regimes in the plantation.

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