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 CARBON STOCKS OF HOMEGARDEN SYSTEMS IN LAMPUNG, INDONESIA

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ABSTRACT

Homegardens are a common smallholder agroforestry system in Indonesia and through the world. They are species rich tree-based system produce non-wood and wood products for both homeuse and market sale. Due to their high biomass these systems simultaneously offer potential for carbon storage, which may help slow global warm and positively effect related environmental problems. Field study in North Lampung, Indonesia reveal that 13-year-old homegardens stored 107 t C ha⁻¹. Comparison and extrapolation of this data with carbon stocks for other tree-based systems in Lampung indicate that at age_30 years homegardens will contain 210-220 t C ha⁻¹. Even decreasing the total by 20% for the periodic removal of wood the remaining carbon stock (184 t C ha⁻¹) is significantly higher than that of *Imperata* grasslands, which are low (35 t C ha⁻¹ in Lampung) due to the periodic wildfires that maintain the *Imperata* ecosystem. While individual homegardens, or other smallholder agroforestry systems, store small amounts of carbon on a per hectare basis these systems can storage as much carbon natural forests. In aggregate, smallholder agroforestry systems can contribute significantly to a region's carbon budget. Smallholder agroforestry systems have the added advantage of contributing to subsistence and income generation objectives of smallholder farm families. The paper suggests that it is timely and appropriate to explore mechanisms by which communities or consortium of smallholder farmers may access international carbon investments to convert low-biomass (low-carbon) underutilized landuse systems it to productive tree-based systems containing high carbon stocks.

INTRODUCTION

Increasing levels of atmospheric 'greenhouse gases' are believed to be a main contribution to global warming, which studies indicate is changing the earth's weather patterns and could raise ocean levels substantially in the next 100 years. These climatic changes will impact environmental norms and human populations causing serious negative disturbance to the global economy. As international concern over greenhouse gas emissions and global warming in industrial, political, and social spheres find common ground, it appears that carbon will become an internationally traded commodity.

Forest-based landuse systems – natural forests, forest plantations, and agroforestry systems – sequester carbon dioxide, an important greenhouse gases, through the carbon stored in their biomass. By changing landuse practices it is possible to increase or decrease the amount of carbon stored in a landuse system. The most significant increases in carbon storage