

Summary

Indigenous land tenure institutions and land inheritance rules in Western Sumatra have undergone considerable transformation. Traditionally ownership of land by lineage consisting of three generations was common, and land use rights were transferred from a mother to her daughters. Yet, the joint ownership of land by sisters as well as single family ownership has become common in recent years. Furthermore, egalitarian inheritance by daughters and sons, and even the patrilineal system in which only sons inherit land have been widely and increasingly adopted. These changes are more pronounced on sloped land areas, where shifting cultivation used to be practiced, than on flat paddy land.

Primary forest still exists in our study sites, but its total area has been declining. Cleared forestland was traditionally used for producing food crops under shifting cultivation. Agroforestry growing coffee, cinnamon, rubber, has become more widespread over time. Although the biomass of agroforest falls short of primary forest, it is environmentally superior to bushy fallow land. In fact, it contributes to the creation of biomass, the prevention of soil erosion, and the preservation of water resources to a significant extent. In the hilly and mountainous areas, farmers generally suffer from the severe poverty and food crop farming tends to be stagnant. If the development of agroforestry enhances the income of farmers in such areas, it will be conducive to the reduction in the incidence of poverty and the improvement in natural resource base.

This study attempts to identify the determinants and the consequences of the evolution of customary land tenure institutions, to explore the causes of deforestation and the development of agroforests, and to identify the impacts of land tenure institutions on

the efficiency of farm management based on a case study of rubber, lowland paddy (rice), and cinnamon production in customary land areas of Sumatra.

The basic hypotheses in this study are as follows: (1) Land tenure institutions have evolved toward more individualized tenure in order to enhance incentives to invest in commercial trees in the face of increasing population pressure on land; (2) The incentives to invest in tree planting are not simply determined by the strength of land rights or the level of land tenure security but also by the expected changes in land rights after tree planting; (3) It is greater profitability of tree crop production that leads to greater individualization of land tenure; (4) Population pressure increases the profitability of agroforestry relative to food production, because the agroforestry system requires more intensive use of land than food crop farming under shifting cultivation systems

Data collection was undertaken in two phases: an extensive survey of sixty communities located over a wide area in the buffer zone of National Kerinci Seblat Park based on group interview of community members, supplemented by a brief survey of five households in each of these communities; and a follow-up of an intensive household survey in two typical cinnamon-growing villages in Kerinci District, and two typical rubber-growing villages in Rantau Pandan sub-district in Jambi Province.

This study demonstrated that customary land tenure institutions have been evolving towards greater tenure security responding to increased scarcity of land and commercialization of tree crops. The extent of individualization, however, was different for different types of land: While the traditional ownership system is found to exist in

paddy land, more individualized ownership systems are widely observed in upland areas (rubber and cinnamon areas).

It was also found that decreases in inherited land per household and increases in the number of male workers led to clearance of primary forest, whereas changes in the inheritance system from matrilineal to a bilateral system and the development of agroforests did not significantly influence the pace of deforestation. It was also revealed that wealthier households tend to clear forest and develop agroforests more actively than less wealthy counterparts.

This study obtained statistical evidence that the probability of tree planting is higher in formerly forest and inherited land, which is subject to customary land tenure rules, than in private purchased land, and that the difference in the strength of land rights between matrilineal and egalitarian inheritance does not have any effect on the pace of tree planting. These results support the major hypothesis in this study that the incentive to invest in tree planting is affected not only by the strength of individual land rights but also by expected changes in land rights after tree planting.

The statistical data show that shifting cultivation (slash-and-burn agriculture) on upland farms is no longer profitable. On the other hand, there is no statistical evidence that residual profit per unit of land is affected by land tenure institutions in the lowland paddy (wet rice fields). Similarly, there was no significant difference in management efficiency of rubber and cinnamon production between newly emerging private ownership and single family ownership systems according to the regression analysis of the age-profile of profit from rubber and cinnamon production. These results indicate

that the prevailing land tenure institutions in both the lowlands and uplands are equally conducive to efficient farm management.

This study also has obtained evidence that land rental and labor markets allocate resources efficiently among households endowed with different proportions of land and labor. Tenure security established under the prevailing land tenure institutions is likely to have contributed to the formation of effectively functioning factor markets because security of ownership is a prerequisite for efficient factor market transactions.

I believe that the demonstration of these empirical facts, using enormous amount of primary data, will make a significant contribution to the literature on land tenure and natural resource management. If our conclusions are valid, there ought to be ample room for reducing poverty and improving tree-resource environment by disseminating profitable and improved agroforestry technologies. In short, there is likely to be no tradeoff between efficiency and equity, as far as the development of agroforestry is concerned.