

SEAG-Symposium, 27.-31.8.2001, Los Baños, The Philippines

**“Resource Management:
Private-Public Partnership and Knowledge Sharing”**

**Agroforestry technology development to bridge divergent between farmer
production goal and government environmental goal :
A participatory approach**

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Abstract

Soil, water and forest conservation problems in developing countries involve a large group of farmers. These farmers normally characterized with the following attributes: a) small land holding size (between 0.5 – 2 ha), b) low income and, c) short term view, which causing lack of environmental appreciation. These attributes should be taken into consideration for sustainable soil and water conservation. Mechanical structures such as terracing, gully plug, etc proved to be not sustainable in this environment due to the high input and maintenance cost and high labour requirement, which small farmer with low income hardly can afford. Therefore, the adoption of mechanical structures for soil and water conservation in developing countries is usually low.

Sustainable soil and water conservation in this environment has two aspects: 1) appropriate type of technology and 2) active's farmer participation. Appropriate technology calls for a balance between production goals and environmental goal. Farmers are concern toward production goals while most development projects and government agencies promoting watershed management are concern toward conservation and environmental goals benefit people living at downstream.

This study focuses on the first of two aspects mentioned above, that is evaluation of appropriate type of technology and approaches for sustainable soil and water conservation in Indonesia. Indicators used for evaluation are:

- Farmer profitability (financial indicator, return to labour)
- Global environmental indicator (Erosion rate and Carbon sequestration)

From those indicator sustainability index was determined using analytical hierarchy process. Among existing soil and water conservation technologies and approaches in Indonesia, agroforestry technology in form of multistrata cropping system received highest sustainability index. It means that agroforestry technology in form of multistrata cropping system will better bridge gap of farmer production goal and government environmental goal better than other soil and water conservation technologies and approaches such as mechanical structures. The second aspect, that is active's farmer participation, is still in preparation. Obtained result from first aspect, that is multistrata cropping system will be implemented in form of on-farm research where farmer take active role in designing, analyzing, and monitoring the experiments.