



CSAR, AARD

Bridging the gap between farmers' production orientation and the watershed conservation goal in Indonesia's greening program



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Regreening is the main objective of Indonesia's watershed conservation program conducted on critical farmers' land through farmers' participation. Initiated in 1976 by a Presidential Instruction the program has the following objectives:

- Watershed resource conservation
- Farmers' prosperity improvement (productivity increase).

Regreening, executed by the district-level Forestry and Conservation Service, encompasses:

- village-level demonstration,
- nursery of tree crops and grasses,
- community forest,
- mixed garden,
- check dam,
- gully plug.

The main effort is spent on the demonstration units and village nurseries.



Figure 1. Typical upland farming in West Java. Upland crops are planted between unevenly distributed of various kinds crop of tree crops



Figure 2. Vegetable crop based farming in West Java. Tree crops are mostly confined to field borders.

The most common measures demonstrated in the 10 ha area are

- Tree planting:
 - 100 trees/ha for land with slopes <25 %,
 - 200 trees/ha for land with slopes 25-40 %,
 - >400 trees/ha for land with slopes >40%,
- Bench terracing or terrace improvement,
- Grass strip on terrace lips,
- Drainage line and drop structures.



Figure 6. Grass strips are the most readily adopted technology among farmers having ruminants. Farmers in West Java tolerate the competition exerted by grasses to the food crops.

Each **demonstration area** is established on about 10 ha of farmers' land involving a group of 20 to 50 farmers. Participating farmers receive: technical guidance, subsidized seeds, seedlings, fertilizers, and partial labor payments.

In about 100 ha **"impact area"** surrounding each demonstration unit, farmers receive tree seedlings originated from the village nursery and technical guidance one year after the establishment of demonstration units.

In 500 to 1000 ha **outer area**, farmers only receive guidance from extension workers and on their own are expected to imitate the conservation practices as conducted in the demonstration unit.



Figure 3. Young *Albizia falcataria* as the most commonly promoted tree in the demonstration units.



Figure 4. *Albizia* seedlings in a nursery, ready for distribution to "impact" area.



Figure 5a. Bench terrace on a demonstration unit of a gully-prone Vertic Ustropept in Soppeng, South Sulawesi. This is a very high cost technology in areas where labor availability is low.

Evaluation show that this trees, in addition to existing ones, are only successful if the farmers have certainty of long term tenure and if they do not rely on that piece of land for their subsistence needs. Otherwise, the trees are subject to thinning or removal once they create significant shading.



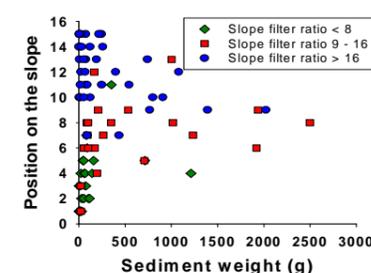
Figure 5b. Stonewall bench terracing practiced by farmers in West Java where labor availability is high.

In general, farmers' adoption in the impact and the outer areas has been very low and this is attributed to a **mismatch** between farmers' production orientation and the government's environmental objectives, and to **the different levels of subsidies** between the demonstration unit and the outer areas.

Serious erosion on steep hill slopes cleared by slash-and-burn for new rubber planting in Jambi (Sumatra)....



But, a field like this contains enough 'surface roughness' and 'filter zones' at the foot of the slope to capture nearly all sediment, and pass on almost nothing to the streams; actually the fertility moves towards the rice crop.... Is there any reason for 'soil conservation' programs to get involved in such a case? May be not.



Quantifying filter efficiency on the slope shown to the left, by open 'coffee filters' at different slope positions.

The amount of sediment increases when moving downhill, but becomes near zero in the riparian strip (position 1 - 4). The amount of soil is less in zones with high surface roughness.

HOW TO BRIDGE THE CONFLICT?

1. The district agency should limit their intervention to facilitating farmers in understanding environmentally related problems, exploring alternative measures to address the problems, and to explain advantages and disadvantages that may accrue from implementation of each measure.

2. Farmers are the ones to decide which measures to be implemented. Filter functions can be achieved at various scale. Soil fertility captured in filter zones should be exploited for far production.

3. Future research should be designed to produce two pronged (production increase and environmental protection) technology options. The two pronged technology options are still limited in vegetable and annual crop based farming areas. Investigation on alternative (vegetative) conservation measures in the vegetable growing areas requires research attention.

Erosion is rampant in steep areas despite the existence of tree and brush stands on field borders. Research is challenged to explore alternatives to solve the problem. The steeper the slope, regulation may play bigger role.

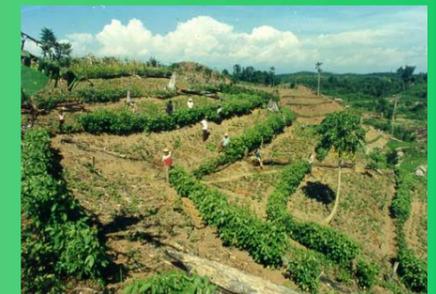


Figure 7. *Flemingia congesta* cotour hedgerow system introduced in an research-extension area in Bengkulu, Sumatra; a prospective measure.



Figure 8. Very steep (>60 % slope) vegetable growing area in Samarang, West Java.



4. Identifying and solving implementation problems should be the main research focus of already scientifically proven effective conservation measures. For this purpose, the demonstration units should also be used as village laboratories from which the government and non-government agencies can learn and improve regreening performance. More importantly, they should understand implementation problems of each measure.



Figure 9. Grass strips on vegetable based farm

5. Levels of subsidies and guidance given to farmers in the demonstration units and the outer areas should be harmonized to obtain a fair judgement across these areas. If downstream interests exceed farmers return on soil conservation some type of financial transfer may be needed on a continued basis.....