

NOT SEEING THE TREES FOR THE FOREST? FROM EVICTION TO NEGOTIATION IN SUMBERJAYA, LAMPUNG, SUMATRA, INDONESIA.

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Land use change, especially deforestation, is often blamed for the loss of watershed functions and still leads to much conflict. The association of 'forest' and 'water' is strong in the public perception. All too often, environmental arguments are used as 'a stick to beat the dog', without a good insight into what makes a landscape - and its various elements - function properly in providing environmental services. Sumberjaya, a large caldera of about 40.000 ha in the southern part of the Bukit Barisan mountain range of Sumatra, Indonesia, has seen a lot of conflict and it may represent possible future trajectories for many other watersheds in Southeast Asia.

In 1998, before ICRAF started working in Sumberjaya, the local government and its forestry department depicted the following problems and context: "Uncontrolled deforestation and conversion to coffee on the slopes have led to a tremendous increase of erosion and reduction of discharge of the Way Besai River. This negatively impacts operation of the newly constructed Way Besai hydro-power dam. Water availability for irrigated paddy rice downstream was reduced."

The Forestry Department was worried about the rapid expansion of coffee in the

seventies, and its visible erosion. Protecting watershed functions was the main purpose to delineate "Protection Forest" in 1990. The enforcement of forest boundaries led to the eviction of thousands of farmers between 1991 and 1996. Evicted farmers were resettled on the infertile acid lowland penepain or converted swamp forest of northeast Lampung. After the political change of 1998, farmers needing a living returned to the area, often under silent approval of the local government that needed income and was interested in economic development ...

Integrated research

Responding to the problems described by the local government, ICRAF and partners aimed to develop a 'negotiation support system' combining a reconciliatory negotiation process with a toolbox that could clarify the likely consequences of plausible land use change. To do this properly, the right questions had to be asked first. Many preconceptions and myths existed as some questions had not been raised before. These included the following 5 points, the results of which are summarised below.

1 How did current land tenure arrangements develop?

Forest areas indicated on a Dutch map of 1939 were almost identical to areas delineated as protection forest in 1990. However, after independence large parts of the State Forest were abolished by President Sukarno and in the 1950ies many war veterans obtained official land titles and started growing coffee on these lands. After 1965, the 'New Order' government did not recognize these land titles as 'legal' as they had other priorities, which led to the logging of most of Sumatra's forests.

2 *What land use sequence appears after deforestation?*

Deforestation in Sumberjaya was rapid, responding to peaks in global coffee prices. However, since the late 1980ies a 're-treeing' phase started whereby farmers converted much of the monoculture coffee stands into mixed shade coffee systems. Ironically, coffee farms on private land now have a higher tree cover than the contested 'forest lands'. Insecure land tenure of the forest lands discourages farmers from investing in tree planting.

3 *Did river discharge decrease over the years?*

A time series of daily rainfall and discharge data showed that although on average rainfall remained constant over the years, the average discharge increased. Reduced evapo-transpiration of coffee gardens compared to forest is the likely cause. Perhaps coffee farmers should receive a reward, because with the land under coffee the hydropower scheme can operate more days per year at full capacity than if the watershed would be under forest cover!

4 *Did low flows decrease over the years due to land use change?*

A real decrease of low flows in the Way Besai in the dry season did occur; however, the number of years with a prolonged dry season also decreased. An increase of El Niño years (1976 vs. 1991, 1994 and 1997) induced the perception that dry season flows were reduced by local land use change rather than by global climate change.

5 *Under what land use types and practices is erosion problematic?*

Erosion under various landuse types (forest, bare soil, coffee with different degrees of tree cover) was measured on 80 plots in two locations between 2001 and

2005. Near the area where the Forestry Department carried out erosion research in the 1980^{ies} erosion rates between 4 ton ha⁻¹ year⁻¹ (forest) and 30 ton ha⁻¹ year⁻¹ (bare soil) were confirmed. However 6 km closer to the outflow, erosion rates ranged between 0.1 (forest) and 4 ton ha⁻¹ year⁻¹ (bare soil) under the same treatments. Thus, even bare soil plots yielded less sediment than forest plots in another area! In coffee gardens the erosion rates were in between those of bare soil and forest, depending on soil cover. Erosion was the highest in coffee gardens of 3 years old and then gradually declined as litter layers established soil cover. Discharge, turbidity and sediment concentration measurements in the Way Besai and its tributaries in 2005 showed large differences between catchments and thus confirmed the plot level research results. The old crater landscape has a high diversity of geological substrates. Even under dense forest cover some pristine headwaters can turn quite turbid. Research now focuses on the importance of roads and foot paths, and riparian filter vegetation as well as the geological background of the soils.

Future challenges

Collaborative research helped debunk some of the past myths. "Negotiation" has replaced "eviction" as key word. In 2000, a Community Forestry program was set up allowing farmers to obtain land tenure in return for protecting the remaining forest and planting trees in their coffee farmers. A Water Forum has been established to facilitate communication between the various stakeholders, such as farmer communities, government agencies, and NGO's.

However, translating these research results

into policy action takes time. It remains to be seen to what extent agencies can reinvent themselves and move from mere executors of blue prints into a mode of asking questions, looking for answers and solutions, distinguishing between symptoms and causes. Replacing the generic 'forest' concept by a set of quantifiable indicators of watershed functions will help, but this will require public support. The pool of trained people and the tool box with tested and relatively cheap methods to assess, for instance, water quality and erosion is expanding. Collaborative research between national and international institutes improves the prospects of correctly assessing the local context and opening doors to policymakers.

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BASIN MANAGEMENT IN NORTHERN THAILAND: EMERGING LESSONS

By David Thomas

In the discussion on deforestation, reforestation and forest conversion in the tropics water always plays a prominent role. By contrast, the European water framework directive gives guidance on how the quality of surface water should be managed, without explicit reference to forests or trees. In northern Thailand similar ideas are now emerging, after many decades of a forest-biased public debate.

The EU Water Framework Directive has the following key aims:

- water management based on river basins
- expanding the scope of water protection to all waters, surface waters and groundwater