



RHA as method

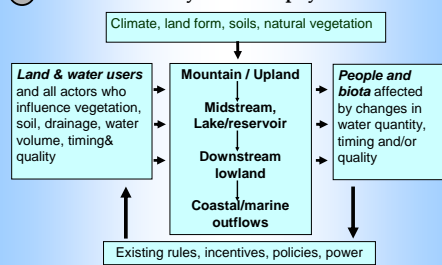
- Watershed functions may well be the most realistic basis for forest derived Env services (E S)
- Three types of knowledge on Watershed function :



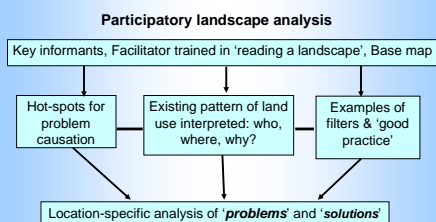
Why rapid ?

- Targeted at the scoping stage
- Time availability (6 months)
- Affordable - setting assessment cost (will be part of transaction costs for any rewards agreement) ; \$ 5-10,000 as target

1 Stakeholder analysis within physical river basin



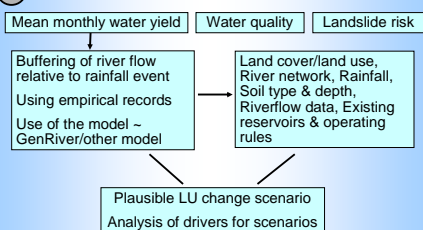
2 Local ecological knowledge (LEK) — Forest, Landscape, Water, River flow & water quality



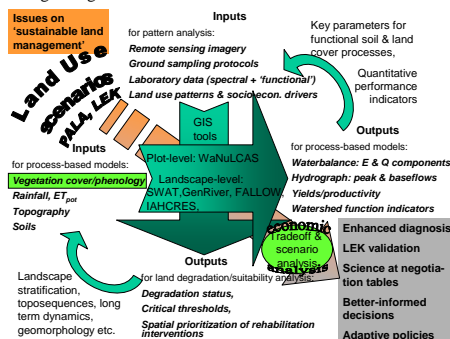
3 Public/policy ecological knowledge (PEK)

Hydro-ecological knowledge :
Government officials
Downstream stakeholders
Urban/general public

4 Hydrologist's ecological knowledge (HEK)



Integrated Pattern * Process research of watershed management options can take many years and requires large budgets...

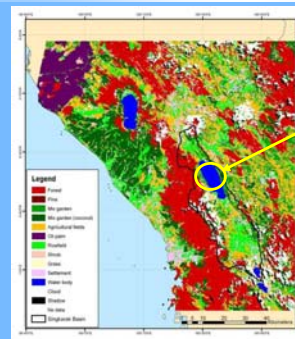


Current applications at Kapuas Hulu & Atambua

RHA is currently being applied in two contrasting sites, Kapuas Hulu-West Kalimantan and Belu-Nusa Tenggara as part of a joint activity between RUPES - ICRAF and WWF, CARE and IIED Programme under DGIS and DANIDA grants: *Equitable Payments for Watershed Services: Phase 1, Making the Business Case.*

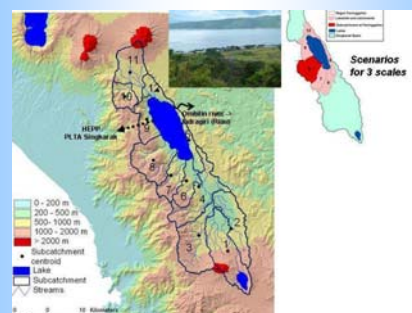


RHA Singkarak, the pioneer

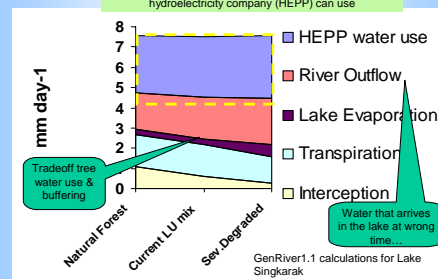


Lake Singkarak Paningahan - Nagari with good governance, forest protection, interest in rehabilitation

Can/should they get bigger share in hydroelectricity royalties as PES?

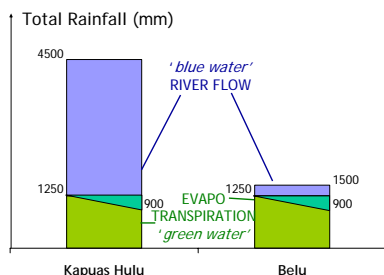


Land use change scenario's, even extreme ones, will not lead to large changes in the amount of water the hydroelectricity company (HEPP) can use



Impacts 2 years after RHA

- | Before RHA Singkarak | After RHA + disc. |
|---|--|
| Deforestation seen as the main culprit of all problems, including blackouts | Focus on lake & its water quality; adjust scale of institution |
| Tree planting as main solution | More awareness of climatic dependence |
| Village with most tree cover should get highest share in royalties | Less blaming the upland deforestation for blackouts |
| Problems with the Ikan bilih fish linked to deforestation | Less focus on 'tree planting' as the only or main solution |
| | More care in planning coffee re-intensification: Kopi Ulu |
| | Ikan bilih problem is about breeding grounds & overfishing |



A simple water balance of the sites. The light blue represents the changes in 'blue water' yield that may occur due to different land use.

Early results highlighting differences between the two sites

	Kapuas Hulu, West Kalimantan	Belu, East Nusa Tenggara
Subcatchment area	1800 km ²	700 km ²
Total rainfall	4500 mm/year	1500 mm/year
Main land cover	Forest, plantation	Secondary forest, shrub and mixed systems
Water use	Drinking, transportation, household use	Drinking, farming, household use
Main issues for local people	Stable river flow throughout the year for transportation	Scarcity of water for farming and consumption
Main issues for policymaker	Water quality (impact of legal and illegal mining and logging)	Soil erosion, overgrazing and water distribution

Belu and Kapuas differ in climate and thus differ in water availability. And yet, the main concern is similar, that is to maintain stable river flow, albeit for a different purpose. Reward mechanism should link to management of land use by local people that can maintain stable low flows. In Kapuas Hulu, this should also link to mechanism that can provide incentives to local people in protecting their existing forest and agroforestry.