

A payment for ecosystem services (PES) initiative for hydrological ecosystem services in the middle hills region of the Himalayas

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Background

- Kulekhani catchment – an area of 125km², a densely populated (~355/km²) middle mountainous region of the Himalayas;
- Key hydrological ES benefits:
 - Better regulatory services such as erosion and sedimentation control, soil stabilization
 - Annual water availability (marginally increased – due to opposite effects of evapotranspiration and cloud water interception characteristics of upland forests)
- Main beneficiary: Kulekhani hydro-electric power company

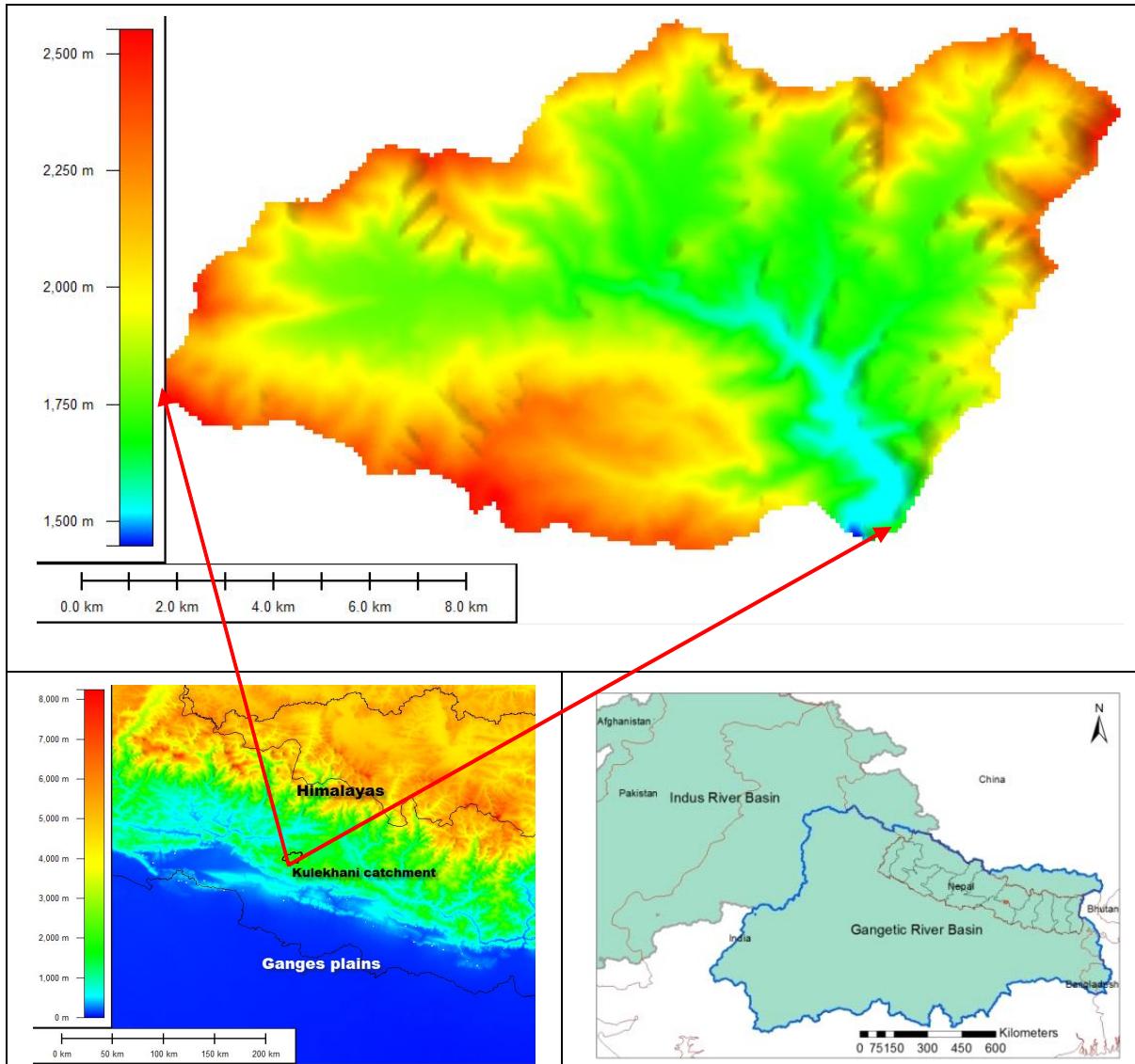


Fig 1: Geographical location and elevation profile (SRTM HydroSHEDS) of Kulekhani catchment (Lehner et al., 2008)

Upland communities' watershed conservation interventions

- Reforestation/afforestation activities;
- Bioengineering works such as river embankment, check dams, gully treatment; and
- Community forestry management programme (>90% of catchment forests)





a. Borrow Pit Sarbang Area Before Implementation of Treatment Measures in 1982

b. Borrow Pit Sarbang Area after Implementation of Treatment Measures In 1988



c. Biruwa Ban Conservation Plantation site in Chitlang in 1983

d. Biruwa Ban Conservation Plantation site in Chitlang in 2003

Fig 2: A glimpse of success in conservation interventions in degraded lands (Source: BIWMP, 2003)

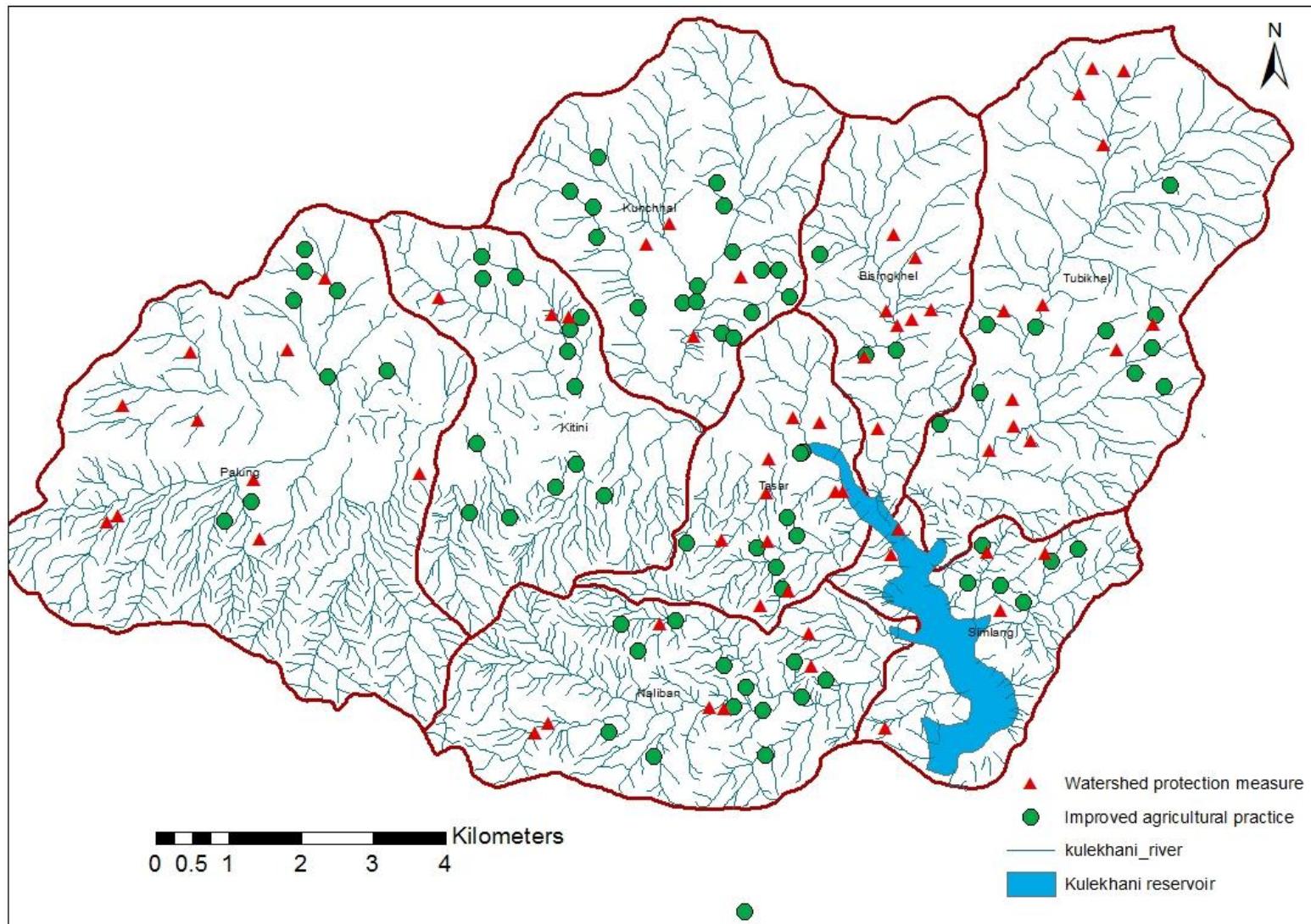


Fig 3: Watershed protection measures implemented in the Kulekhani catchment (Source: BIWMP, 2003)

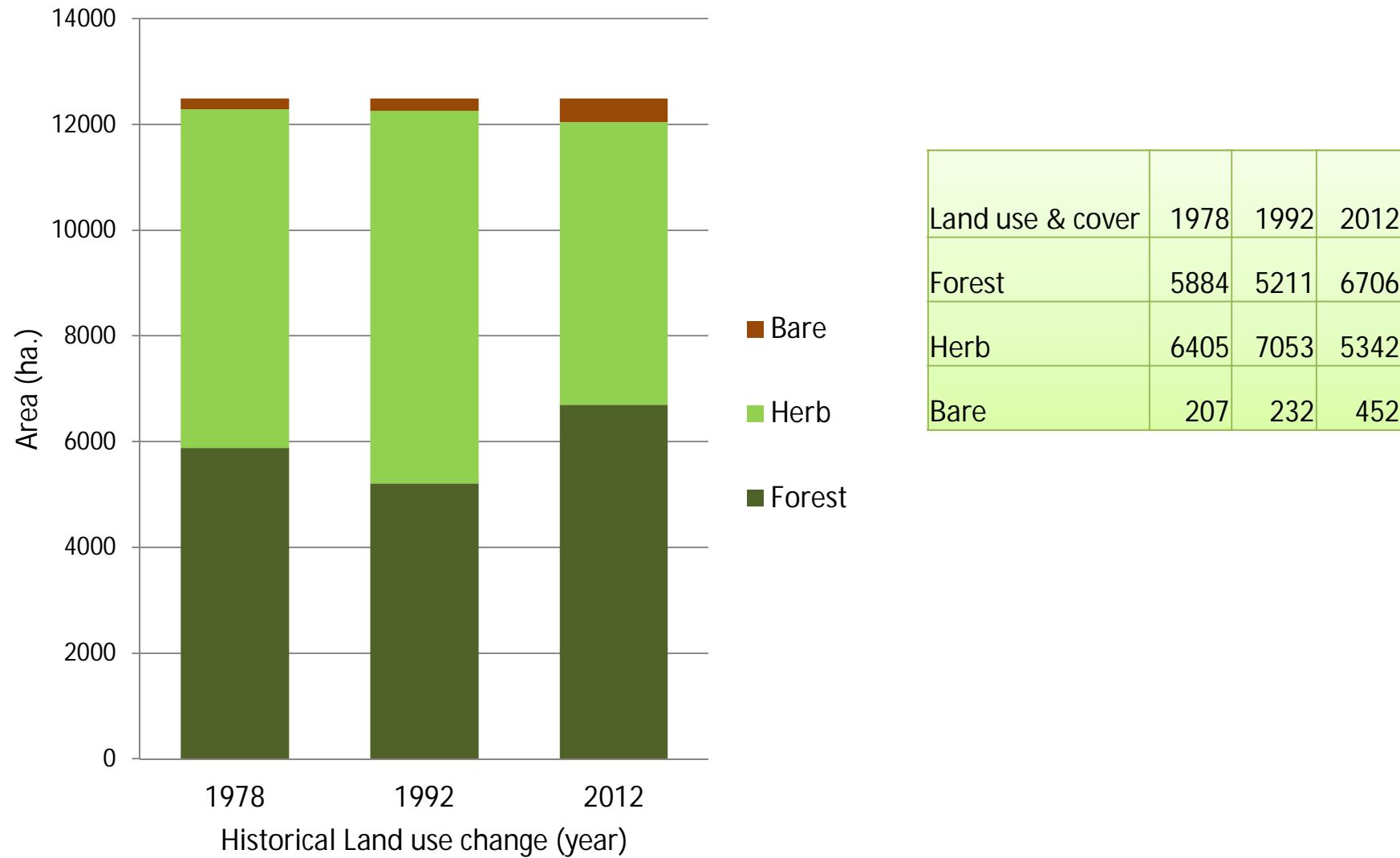


Fig 4: Historical scenario of land use and cover change

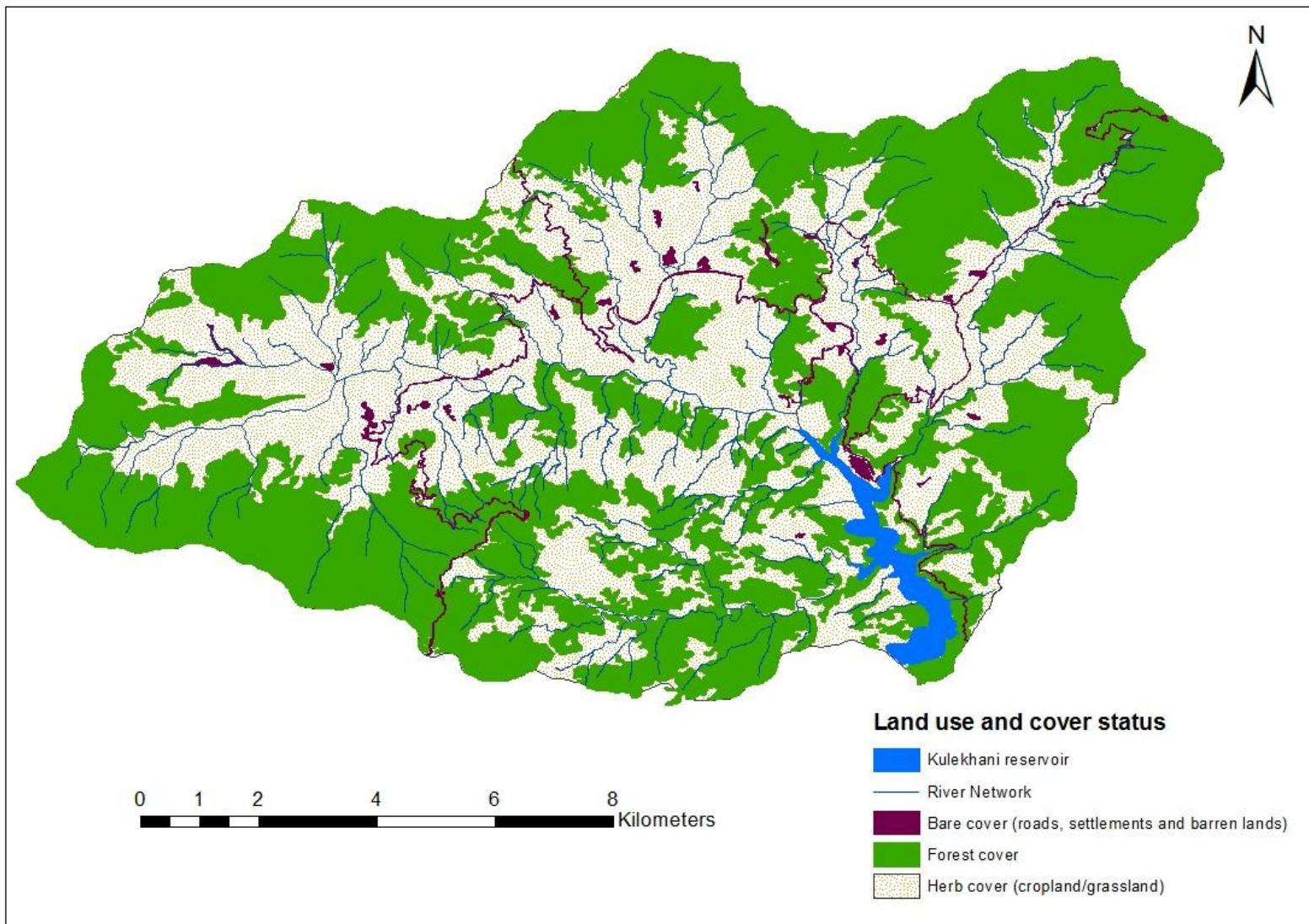


Fig 5: Land use and cover status in 2012

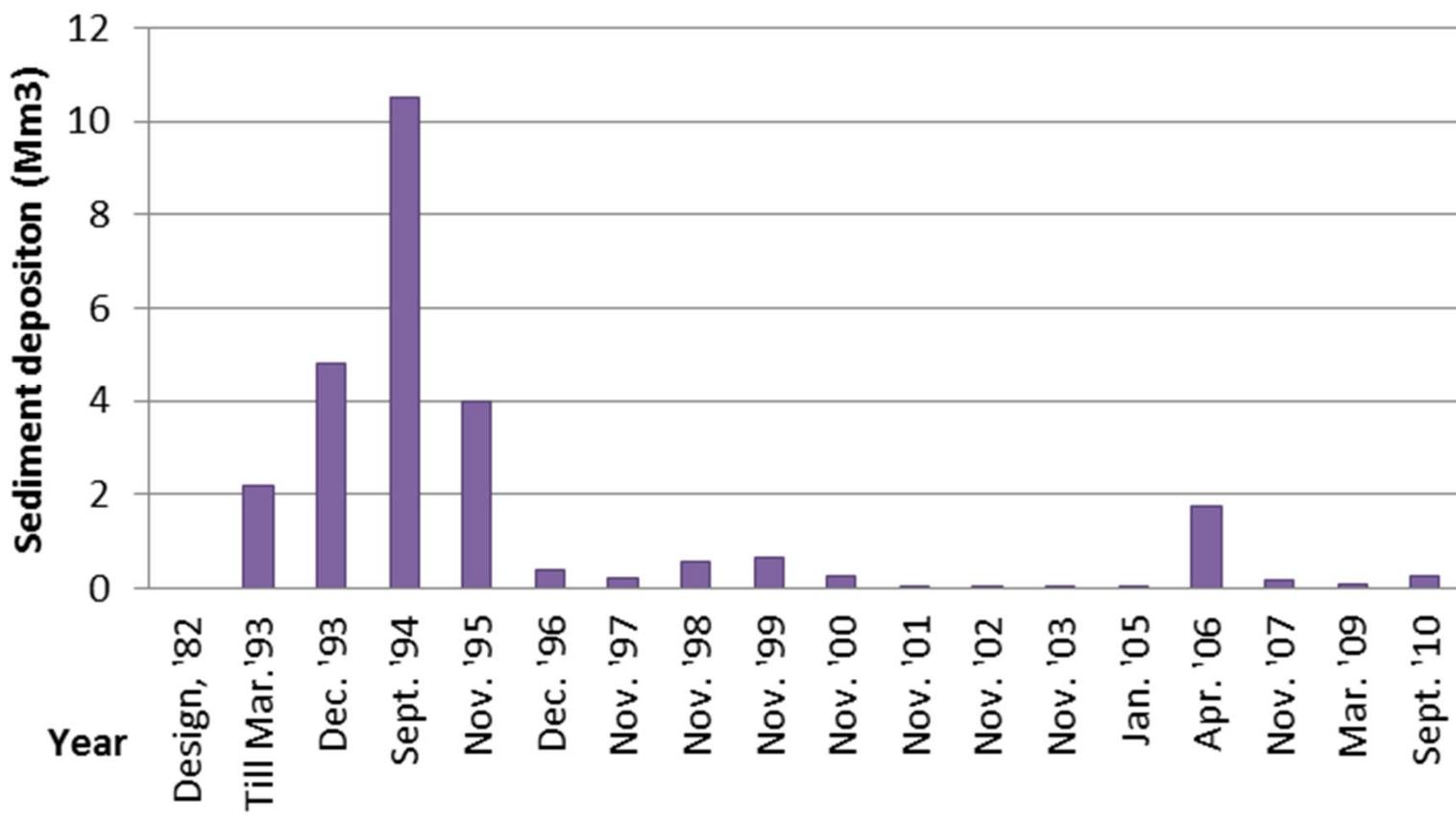


Fig 6: Sediment deposition trend (million m³ per year) (Source: NEA ,2002 and NEA, 2011)

PES programme

- A PES programme called 'Environmental Management Special Fund' (EMSF) established in 2006;
- The EMSF receives 20% of the royalty share (about US\$54,000 per annum) to support conservation and development activities in the catchment.
- District government authority – an intermediary agency
- The EMSF is managed by a multi-stakeholder committee to evaluate and select projects.



Conclusions

- Upland communities' central role in watershed conservation– clearly recognized by establishing a PES programme (i.e. EMSF);
- Since the 20% hydro royalty transfer to the EMSF is a voluntary transaction, the district authority can withdraw from the programme at any time
- Various conflicting interests of upland communities in terms of the better use of EMSF increases the uncertainty of the use of fund in conservation sector
- Thus, further research is needed to identify legal framework (for fund transaction) and clear guidelines for the use of PES fund in conservation and development programmes in the upland areas.

Thank you very much for your attention!!!