Case Study

The ecosystem and biodiversity services for the local communities in the Himalaya include timber, medicinal plants, spices and condiments, fodder and pastures for livestock rearing, and irrigation and manure for agriculture. In the Indian Himalaya the income from agriculture accounts for 32%–36%, woolen products accounts for 18%–24%, the sale of livestock accounts for 28%–38%, and the sale of medicinal plants accounts for 12%–13% of the residents' total earnings. At regional scale, the Himalayan forests are responsible for maintaining soil fertility, hydrological balance, erosion control, and food security. The ecosystem services of alder (*Alnus nepalensis*) for providing high soil nitrogen to cardamom plantations and other croplands in Eastern Himalayas have been documented while in the Western Himalaya, the important ecosystem services of oak (*Q. leucotrichophora*) have been described in terms of soil development, protection of nutrients, water retention, and longevity of the streams in a watershed. A review of the carbon sequestration dynamics in the Himalayan region suggests that the land-use changes and forest or soil degradation affect carbon pools significantly (Upadhyay et al. 2005). Besides several ecosystem services, Himalayan region is a reservoir of high genetic diversity (Singh 2002).

Although some of the largest rivers flow through the region, the Himalayan inhabitants depend on the innocuous springs for their daily water needs. In recent years, numerous springs have dried because of reduced groundwater recharge, climatic change, shift in precipitation patterns, water diversion, withdrawals by dams, increased population pressure, deforestation, and top soil erosion, which are collectively detrimental to the water security of the rural Himalaya.

Dam construction for hydroelectric generation in the Indian Himalaya over the next couple of decades is likely to result in one of the highest average dam densities in the world. In addition, over 27% of these dams would be located in relatively pristine areas. Hydropower infrastructure is likely to submerge and affect nearly 1700 km^2 of the Himalayan forests. The habitat fragmentation caused by such projects is likely to reduce tree species richness by 35%, tree density by 42%, and tree basal cover by 30% in the remaining undisturbed forests. A dam may only need 500 people to move because of submergence, but because the dam stops the river flow it could impact 20,000 people. They also disrupt the groundwater levels thus many area might end up with dry springs and streams. This may further lead to devastation of livelihoods along all the rivers.

Some of the questions that the small groups could deliberate upon would be:

1. What benefits are provided by the Himalayan ecosystems and to whom?
2. Which of these benefits can be captured by dollars and cents in the market and which cannot?
3. Where are the synergies among Ecosystem services in the region?
4. What are the tradeoffs?
5. What stakeholder groups would these tradeoff benefit and who would be the losers?
6. What could be the outcomes for the ecosystem services under each of the different scenarios i.e.:
    a. Market Forces ("an economic and population growth archetype")
    b. Fortress World ("an archetype in which nations and the world become more fragmented, inequitable, and head towards temporary or permanent social collapse")
    c. Policy Reform ("a continuing economic growth archetype, but with discipline/restraint/regulation and effective policy")
    d. Great Transition ("a transformation archetype based on assumptions about limits to conventional GDP growth and more focus on environmental and social well-being and sustainability").

At the end of the workshop the participants could appreciate that:

1. Ecosystems provide benefits to people at different spatial and temporal scales
2. These benefits are not always captured by the markets and policy decisions
3. Our choices affect the range of these benefits, or services, and their value
4. Our decisions create trade-offs that we need to reconcile to have the best outcomes for people and the environment.