BRAINSTORMING SESSION

Ecosystem Services and Gross Environmental Product (GEP)

On 26th Dec 2013

At Doon University, Dehradun

During 8th Uttarakhand State Science & Technology Congress

Uttarakhand State Council for Science & Technology

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Introduction

Humankind benefits from a multitude of resources and processes that are supplied by ecosystem, collectively termed as “Ecosystem Services”. They include all the tangible and non-tangible assets or products which human get from nature like food, recreation, clean water, air and processes such as decomposition of wastes. The term was popularized and its definition was formalized after study conducted by more than 1000 world's leading biological scientists under 'Millennium Ecosystem Assessment' in 2005. The report refers to natural systems as humanity's "life-support system", providing essential Ecosystem Services. The assessment measures 24 Ecosystem Services concluding that only four have shown improvement over the last 50 years, fifteen are in serious decline, and five are in a stable state overall, but under threat in some parts of the world. As human population grow, so do the resources demand imposed on ecosystem and impact of our global footprints.

"Ecosystem services" is a catch-phrase for the complex connections between the natural environment and human well-being. It is primarily based on the impact of changes in the supply of ecosystem services and programs to increase their supply on near-term growth of gross domestic product (GDP). Major focus these days is on the relationship between locally generated versus trans-boundary services and growth in developing countries where the highest rates of ecosystem degradation tend to be found. There is a fundamental relationship between environmental protection and economic growth. This can make policymakers reluctant to support environmental protection. Where the environment is a source of economically important services, then environmental protection may stimulate growth of gross domestic product instead of reducing it. Sound management of ecosystem services provides several cost-effective opportunities for addressing multiple development goals in a synergistic manner. However, these services are being majorly hit by the uncontrolled anthropogenic activities.

"The eight Millennium Development Goals (MDGs) were endorsed by governments at the United Nations in September, 2000. The MDGs aim to improve human well-being by reducing poverty, hunger, and child and maternal mortality; ensuring education for all; controlling and managing diseases; tackling gender disparity; ensuring sustainable development; and pursuing global partnerships. Progress achieved in addressing the MDGs (Box 1) is unlikely to be sustained if ecosystem services continue to be degraded. A coordinated, integrated, cross-sectoral policy framework with a long-term focus need to be implemented to sustain ecosystem function and in turn to achieve the MDGs.

Ecosystem Services and the MDGs

Slowing or reversing the degradation of ecosystem services contribute significantly to the achievement of many of the MDGs.

Poverty Eradication: *ecosystem services are a dominant influence on livelihoods of most poor people. Most of the world's poorest people live in rural areas and are thus highly dependent, directly or indirectly, on the ecosystem service of food production, including agriculture and livestock. Mismanagement of ecosystems threatens the livelihood of poor people and may threaten their survival. Ecosystem degradation is often one of the factors trapping people in cycles of poverty.*

Hunger Eradication: *Although economic and social factors are often the primary determinants of hunger, food production remains an important factor, particularly among the rural poor. Food production is an ecosystem service in its own right, and it also depends on watershed services, pollination, pest regulation, and soil formation. Ecosystem conditions, in particular climate, soil degradation, and water availability, influences progress toward this goal through its influence on crop yields as well as through impacts on the availability of wild sources of food.*

Reducing Child Mortality: *Under-nutrition is the underlying cause of a substantial proportion of all child deaths. Child mortality is also strongly influenced by diseases associated with water quality.*

Combating Disease: *Human health is strongly influenced by ecosystem services related to food production, water quality, water quantity, and natural hazard regulation, and the role of ecosystem management is central to addressing some of the most pressing global diseases such as malaria. Changes in ecosystems influence the abundance of human pathogens such as malaria and cholera as well as the risk of emergence of new diseases.*

Environmental Sustainbility: *Achievement of this goal will require, at a minimum, an end to the current unsustainable uses of ecosystem services such as fisheries and fresh water and an end to the degradation of other services such as water purification, natural hazard regulation, disease regulation, climate regulation, and cultural amenities.*

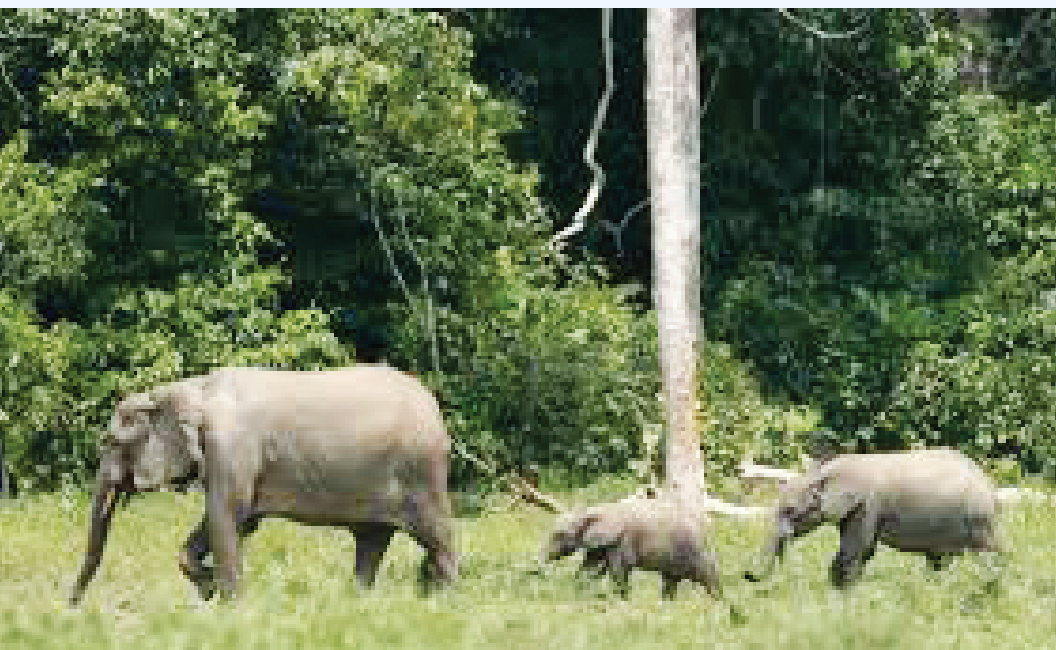
SOME INNOVATIONS IN ECOSYSTEM SERVICES

In recent years, innovative financing mechanisms, and more specifically payments for ecosystem services (PES) have become instrumental for addressing the environmental management. PES make it possible to internalize environmental costs and benefits in decision making. When financial resources to address environmental concerns are limited, PES can generate additional resources, redirect funds to environmental friendly technologies and sustainable production patterns, create incentives for investment, and increase private-sector involvement in environmental protection. PES have the potential to improve the quality of decision-making and facilitate the integration at all levels of relevant policies (e.g. agriculture and forestry, urban development, water, energy and transport). Uttarakhand state has also raised its voice to get PES referring 'Green Bonus' for maintaining ecosystem services at its optimum level.

The system of PES is in its initial phase, therefore, political support should be created and maintained at all levels and across all sectors to promote its establishment. Political support is also needed to adapt legislation, institutional arrangements and policies where needed, and to provide an attractive political and legal environment for the private sector's participation.

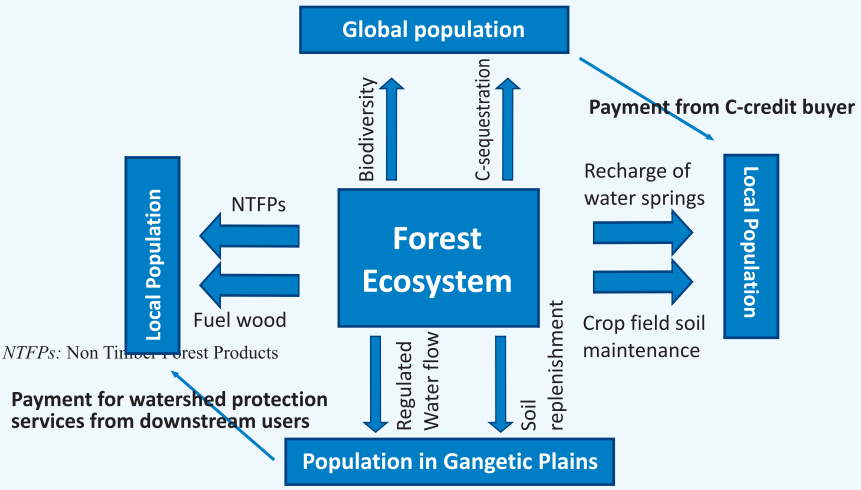
ECOSYSTEM SERVICES IN THE INDIAN HIMALAYAS

Mountains provide numerous ecosystem services which comprise biodiversity, biomass and carbon stock. Mountains support 25% of the planet's biodiversity and have 50% of the world's biodiversity hotspots. 32% of global Protected Areas (PAs) are in mountains. The Himalaya has 488 Protected Areas covering 39% of the region's terrestrial area. It is also known as the water tower of India, which provide clean water to almost complete North Indian region through perennial rivers starts from its glaciers. Mountain ecosystems contribute in regulating global climate by mediating carbon, energy, and water balance at the land surface. The Himalayas, for example, influence the monsoon & rainfall patterns of the Indian subcontinent. A few ecosystem services among others are enlisted here with some detail:



Major Ecosystem services	Providers	Receivers
Carbon sequestration	Forest management communities, national parks, forest departments	Global community
Recreation and scenic beauty	Government and forest management communities	Domestic and foreign tourists
Watershed protection	Upstream forest management communities, watershed managers	Downstream communities- local and regional
Biodiversity conservation	Local communities, forest department, national parks, farmers	Local, regional and global communities
Soil formation and replenishment of fertility	Upland farmers, local mountain communities, forest department	Downstream farmers- local and regional
Pollination	Forest managers; tree growers	Downstream Farmers
Colonization	Managers; tree growers	Government, forest growing communities, forest owners

A total of 70% area of Uttarakhand is covered with forest which render a very limited area for development activities and thus, thwarting the state's efforts for development. The State Government has requested the Central Government to allot an additional Rs. 2000 Crores per year as "Green Bonus" to the State of Uttarakhand. The 13th Finance Commission has provided the grant at Rs. 51 Crores per annum for five years but tied it to spending on forests, depriving the state of any free float. It is nowhere even close to a 'green bonus'. It clearly indicate that there are some issues and challenges in understanding the concept of Ecosystem Services, PES and its failure to reach up to policy. A closer view on forest ecosystem services and payment system for the service given by it is shown by following diagram:



NTFPs: Non Timber Forest Products

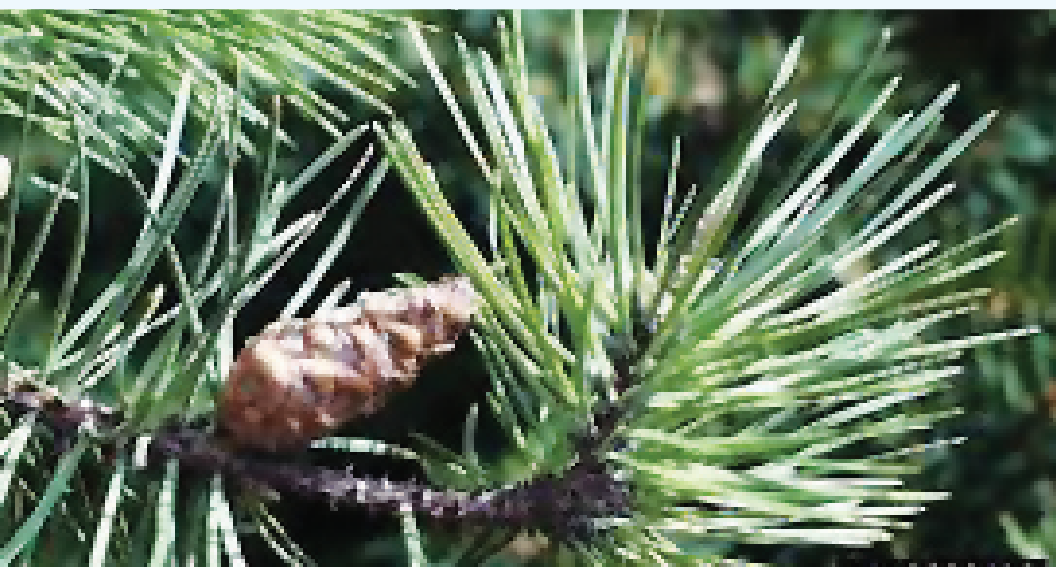
ISSUES AND CHALLENGES

Value of ecosystem service has not been captured in GDP and their contribution to national economies and people's livelihoods is absolutely invisible. Following are some of the issues and challenges which are prominent bottleneck in establishing ecosystem services as one of the key sectors of GDP:

- Ø Lack of recognition of ecosystem services in economic decision-making, development planning & resource allocation-value of ecosystem services is either ignored or poorly understood (Policy failure)
- Ø Inadequate or missing market for many ecosystem service (Market Failure)
- Ø Insufficient compensation for ecosystem services (Institutional Failures)
- Ø Knowledge gaps-challenges to provide economic value of ecosystem services, regulating, and supporting services.

THE BRAIN STORMING SESSION AND DISCUSSIONS

There is growing concern in Uttarakhand to generate data for Gross Environmental Product (GEP) along with Gross Domestic Product (GDP) to measure and monitor the state of natural resources and overall growth. GEP is the measure of ecosystem services of any area. This is expected that GEP will be helpful to boost economic growth along with funds to keep ecosystem services at its optimum. GEP will act as a balance between ecology and economy. In order to facilitate the process of quantifying the GEP, a Brain-storming Session on "Ecosystem Services and GEP" was organized in Doon University during Eighth Uttarakhand State Science & Technology Congress 2013 (8th USSTC 2013) with good indent of drawing a road map to the entire process of survey, qualifying and quantifying the GEP that could viably be integrated in to the process of sustainable development in the State.



KEY POINTS AND SUGGESTIONS OF THE SESSION

The deliberations in Brain Storming session highlighted issues of ecosystem services in Uttarakhand. In view of importance of the topic for the state and its inhabitants, the session attracted good response from the participants. Experts in their presentation were unanimous that there are strong points in generating data of GEP and putting it with GDP to boost up the economy. Experts discussed on the matter and following key points and suggestions emerged out which may be instrumental for Line Departments such as Directorate of Economics & Statistics and State Planning Commission, Forest department and Agriculture department of Uttarakhand Govt. in policy making for Ecosystem Service:

1. Biophysical and spatio-temporal dynamics needs to be kept in mind while quantifying and valuing ecosystem services.
2. A team of ecologists and economists need to be constituted foe GEP exercise in the state. Close sectoral and discipline integration needed to move forward in consideration of ES in policy.
3. All the perspective of environment should be taken into consideration to calculate the ecosystem services. However, forest and water are the main resources in Uttarakhand, therefore, they need to be addressed first for GEP exercise.
4. Payment of economic services (PES) such as 'Green Bonus' is a new concept coming up worldwide, therefore, PES in Uttarakhand need to be documented.
5. Ethical questions and social disparity should be kept in mind as priority area while valuing the ES.
6. Index-based approach can be a useful method to calculate the ecosystem services.
7. Conservation and promotion of forgotten foods of Uttarakhand (for eg. Millets) which are not only nutritious but also sequester more CO_2 than the ordinary crops should be done in Uttarakhand along with biodiversity based organic farming for sustainable livelihood.
8. Prohibition of sewage and municipal water disposal on river bank through mass awareness program. River bank restoration should be the priority area in Uttarakhand and maintained through strict laws.
9. Develop frame-work to understand the impact of climate change on ecosystem services.
10. Develop non-market method to strengthen and evaluate Ecosystem Services. Stress should be given on intangible assets, skills and knowledge specially the cultural values.
11. A Livestock-mediated farming practices should be promoted and strengthen towards contribution in ecosystem services.
12. Important emphasis needed for conservation and protection of important insects as they play a vital role in ecosystem services.
13. GEP should be quantified for the state to get specific funds and thereby maintaining the ecosystem services at its optimum.
14. Involvement of local communities by integrated approaches of awareness programs on ecosystem services should be promoted.
15. In case of environment degradation, strategy by which ecosystem services could be restored from their current level should be promoted.

RECOMMENDATIONS:

1. There was general agreement that economic concepts of GDP, GNP or per capita income do not reflect the correct state of economic development of a State or Country as these concepts do not reflect on the status of environment of the State/country impacted by economic growth. In view of the aforesaid, the Session agreed on adoption of the concept of green accounting for Uttarakhand State
2. The Session agreed on use of the term Gross Environmental Product (GEP) for institutionalizing the green accounting in the Uttarakhand State
3. The Session agreed that GEP for Uttarakhand State in the early stages will be compiled in addition to the GDP of the State, and at appropriate time in future, it will be integrated with the GDP
4. It was agreed that measure of factors like, water, soil, forest, biodiversity, emissions, degradation, pollution, etc signifying quality of environment should be included in the green accounting. The State Government may take a final decision on acceptance of these factors for compiling the green accounts of the State by adding to, or replacing these factors/parameters as required
5. It was also agreed to explore the inclusion of non-market elements like cultural value, social value like Gross National Happiness (GNH) in the GEP and, if possible, in the GDP also
6. It was also agreed that the concept of GEP needed to be institutionalized so that the account of State GEP is compiled annually and regularly like GDP account of the State

ECOSYSTEM SERVICES AND GROSS ENVIRONMENTAL PRODUCT (GEP)

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