Ecosystem Services and Natural Capital:

Role in environmental justice in sustainable green development

Chetan Agarwal
Forest and Env. Analyst
ecosystem services & natural capital

- Economic and financial activity rests in a web of nature and ecology
Introduction to the Millennium Ecosystem Assessment

- effort to map the health of our planet
- integrated assessment of the consequences of ecosystem change for human well-being and to analyze options available to enhance the conservation of ecosystems and their contributions to meeting human needs.
– **Conceptual Framework**
  - Ecosystem services
  - Well being
  - Drivers of change & Decision makers
  - Cross-scale Interactions and Assessment

– **Values Associated with Ecosystems**

– **Assessment Tools**
  - Scientific and traditional knowledge
  - Frameworks, models and scenarios

– **Strategies and Interventions**
Ecosystem services

- **Ecosystem.** An ecosystem is a dynamic complex of plant, animal, and microorganism communities and the nonliving environment interacting as a functional unit. Humans are a part and size varies

- **Ecosystem services.** Ecosystem services are the benefits people obtain from ecosystems. These include:
  - provisioning services such as food and water;
  - regulating services such as regulation of floods, drought, land degradation, and disease;
  - supporting services such as soil formation and nutrient cycling;
  - and cultural services such as recreational, spiritual, religious and other nonmaterial benefits.
Human well-being and poverty reduction
- Basic material for a good life
- Health
- Good social relations
- Security
- Freedom of choice and action

Indirect drivers of change
- Demographic
- Economic (e.g., globalization, trade, market, and policy framework)
- Sociopolitical (e.g., governance, institutional and legal framework)
- Science and technology
- Cultural and religious (e.g., beliefs, consumption choices)

Ecosystem services
- Provisioning (e.g., food, water, fiber, and fuel)
- Regulating (e.g., climate regulation, water, and disease)
- Cultural (e.g., spiritual, aesthetic, recreation, and education)
- Supporting (e.g., primary production, and soil formation)

Direct drivers of change
- Changes in local land use and cover
- Species introduction or removal
- Technology adaptation and use
- External inputs (e.g., fertilizer use, pest control, and irrigation)
- Harvest and resource consumption
- Climate change
- Natural, physical, and biological drivers (e.g., evolution, volcanoes)

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Source: Millennium Ecosystem Assessment
Basis for decision making

• Context
• Role of scientific knowledge
• Mechanisms include laws, regulations, and enforcement schemes; partnerships and collaborations; the sharing of information and knowledge; and public and private action.
• Decision making process incorporates ecosystem services and approach
• Nature as ecological assets / natural capital

• Ecosystem Services flow from natural ecosystems,

  analogous

• interest from financial capital
  – Ownership, Rate of return, Risk, Audit, Standards, Enforcement
Issue: Multiple demands on landscapes for goods & services – lead to synergies and trade offs
Diverse Instruments used

- Concepts, Principles, and tools evolved in the last 50 years to try and address the emerging concerns, to identify and quantify and ultimately bring into decision making.
Principles

• Precautionary Principle
  – EIA
    • TOR
    • project impacted party
    • Assessment – who pays
  – Forest Clearance,
  – SEA
    • Broader view – e.g. urban master plans
  – Public hearing
Carrying Capacity

• Carrying Capacity
  – Cumulative assessment
  – Rate of use
  – Extent of development
• Inter-generational equity
  – Stern Report on economics of climate change
  – 4 generations
  – discount rate of 0.01%
• Polluter Pay Principle
• Sustainable Development
• Public Trust Doctrine
• Zoning
• Regulation
• Green Accounting
Compensation

• Compensation - NPV – can all loss be compensated
  – Ecological Entities of incomparable value – beyond compensation
  – State fund receives Rs 500,000 INR – Rs 1000,000 for diversion of every ha of forest
  – Finance commission give Rs 30/ha for every ha of forest retained