Wrap Up of Day 2

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Economic Concept underlying Valuation

- **Value and benefit**
  - Value is the contribution of an action or object to user-specified goals, objectives or conditions.
    - Value in exchange (market price), value in use (utility), value of importance (appreciation or emotional value)
    - Ecosystem valuation: economics (exchange value): anthropocentric view, ecology (importance) and sociology (moral)
  - Benefit: linkage between environment and economy (consumption (utility) & production (supply) of G&S from ecosystem
    - Benefit derived from G&S to be used by producers (direct input), consumers (direct consumption) --> Use value
    - Benefit derived from not using G&S --> Non-use value
    - Benefit of G&S in terms of net of associated cost --> Net benefit
    - Net benefit received from G&S by people --> value of the environment
    - Net benefit for producer: profit, net revenue/return, producer surplus
    - Net benefit for consumer: utility welfare, WTP, consumer surplus
  - Net value = total benefit – total cost ($/year)
  - Average value = total value / total unit ($/unit)
  - Marginal value = change in value / change in quantity ($/unit) --> reflect *scarcity* of resources

- **Economic system and the environment**
  - Change in env. Impact on income, health, other type of resources --> change in people’s welfare --> measure the value of the environment (discrete change)
Economic Concepts Underlying Valuation (cont.)

• Change in environment => change in welfare = environmental value = change in social surplus

• **Consumer welfare measurement:**
  – The area under the marginal WTP curve = total benefit.
  – Net benefit = total benefit - total user cost
  – Consumer surplus (CS) = net benefit

• **Producer welfare measurement:**
  – Producer surplus (PS) = net benefit

• Change in env. => change in quantity demand => change in CS

• Change in env. => change in quantity supply => change in PS

• **Scale up** from individual to population => value of NR to individual => value of NR to the society/target group
Cost-Benefit Analysis

• CBA is a comparison between costs and benefits of an activity.
• Application of CBA: feasibility, EIA, SEA
• Feasibility study: technical, financial, economic, social and environment
• NPV, BCR, IRR
Market Based Value

• Direct Value (on site value): extractive and non-extractive use;
  \[ \text{Net} = \text{Sum}(P_i Q_i - C_i) \]

• Indirect value:
  – Change in productivity
  – Replacement cost
  – Shadow project
  – Cost of illness
Example

Water quality $\downarrow$ Ag.output $\downarrow$ revenue $\downarrow$

W. quality $\downarrow$ health $\downarrow$ treatment $\downarrow$ expenses $\uparrow$

W. quality $\downarrow$ health $\downarrow$ prevention $\downarrow$ expenses $\uparrow$
Example

Damage occurred $\rightarrow$ Envi. cost $\rightarrow$ Improvement activities $\rightarrow$ Real cost paid $\rightarrow$ Potential benefit ??

Damage potentially occurred $\rightarrow$ Protection activities $\rightarrow$ Real cost paid $\rightarrow$ Potential benefit ??
Different Methods in Market Value Approach

1. Health Cost
2. Change in productivity
3. Replacement cost
4. Shadow project
5. Cost effective project
6. Preventive expenditure
7. Opportunity cost

Human activities
→ Change in natural environment
→ Impact occurred
→ Reduce impact
→ Impact not occurred
→ Benefit from protection

Cost of damage

Envi. protection