

# **Need to integrate the economics of ecosystem services into national development planning**

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# **Need I: The productive base of the economy continues to be eroded without being reported and accounted**

1. Indicators like GDP are distorted and does not reflect the changes in the level of welfare
2. Growth accounting does not incorporate ecosystem services leading to erroneous sense of gain / losses
3. Drivers like Trade and Investment impacting the Ecosystems have far reaching impact for society
4. Missing Links of Sectoral Policies causing unsustainable policies



**Ecosystem Macroeconomics**

# Illustration#1 : Compromised Pathways to Growth and Employment

## Example

- If India moves on a growth trajectory of 7%, she would have to wait 68 years to be on par with the GDP of the developed world.
- With an addition of over 350 million coming into the work force (15-60) by 2025, wait for so long would be unimaginable.
- So, a double-digit growth rates in GDP would be desirable (A-5%, M-15%).
- For example, a GDP of 12% per annum, **India** has two options:
  - Achieve and maintain investment levels at 48% of GDP with an incremental capital **output** ratio (ICOR) of about 4.
  - Lower ICOR to the 2.5 to 3 range (through greater productivity and efficiency of capital) and mandate investment levels at 30% of GDP.
- Agriculture, social forestry, watershed programmes, coastal management activities etc have lower ICOR (2.5-3.0) and very high employment elasticity of output and can be savior for economy

## Illustration#2: Losses of Ecosystem Services seriously jeopardize Poverty Alleviation and Other Goals of MDGs

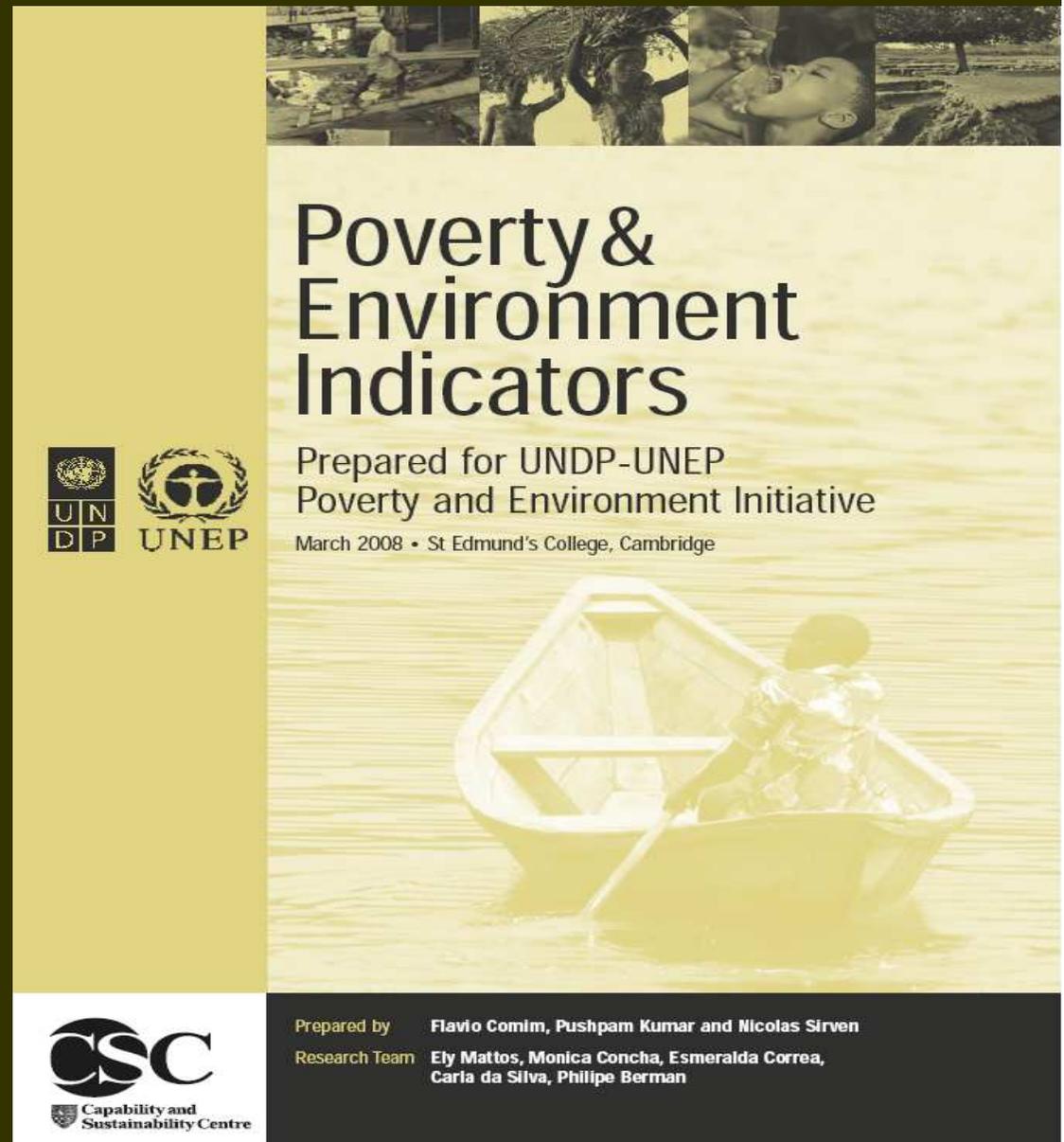
Provisioning and Regulating Services	Provisioning services might be affected by education expansion as infrastructure	Weak or unclear link. MDG2
Provisioning (medicinal plants) and Regulating Services (Water)	Better availability of clean water and traditional medical services would create enabling condition	Indirect link. MDG5
Provisioning and Regulating Services	They would facilitate	Indirect link. MDG6
Provisioning Services	Fair and equitable trade practices	Indirect link, MDG8
Provisioning Services and Regulating Services	Creating enabling condition	Indirect link, MDG4

# Illustration#3: Useful and Usable Indicators

❑ Poverty reduction strategies without taking into account the ecosystem services

❑ General Human Well-Being and Ecosystem indicators are not focused on the links between poverty and environment

❑ Poverty Reduction Strategy Papers (PRSPs) must focus on right indicators



# Illustration #4

## Ecosystem Accounting is needed in their own right

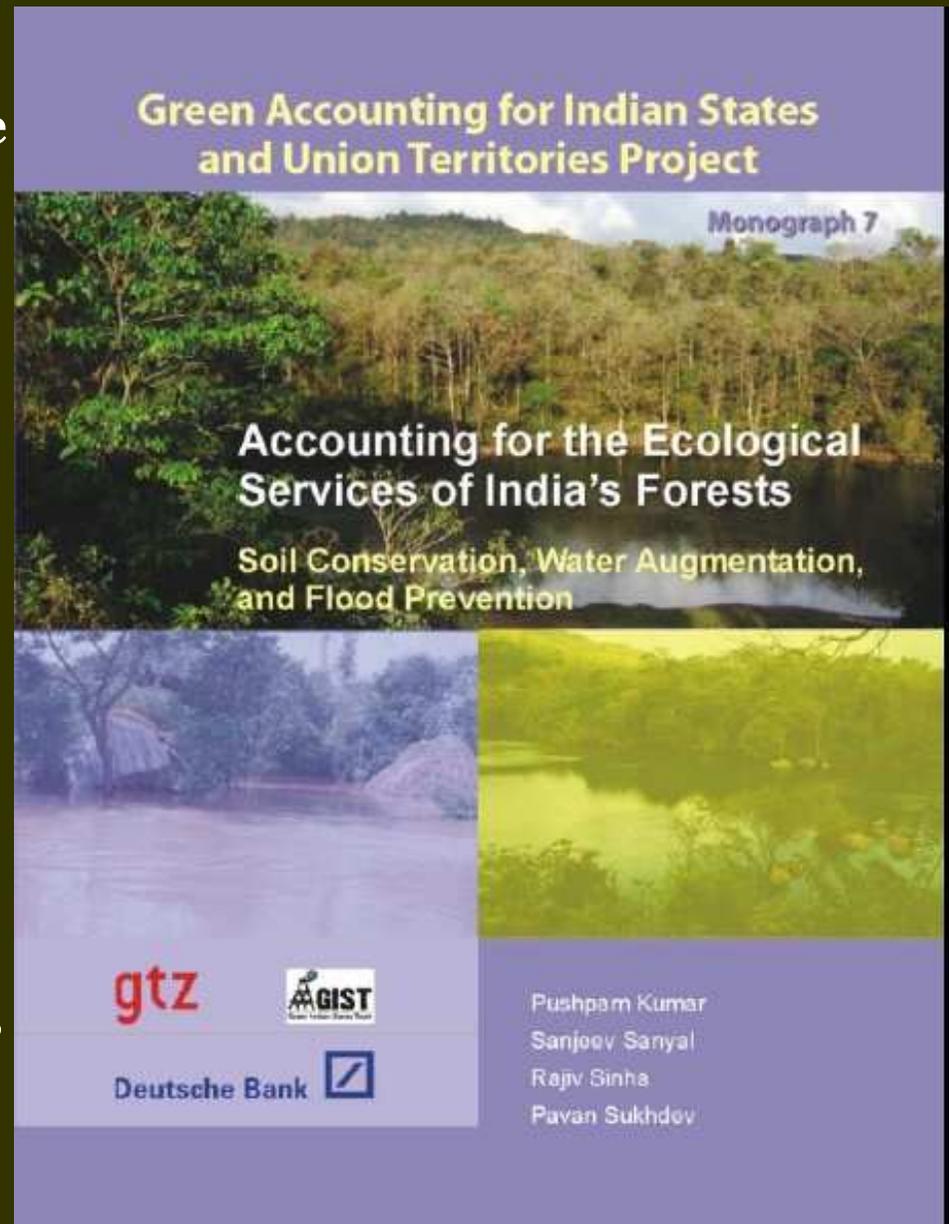
Depletion of Oil (% of GDP)	Net Price	Simple PV	Quasi Optimal
<b>Canada</b>	1.2	0.8	1.1
<b>Indonesia</b>	7.0	4.1	6.4
<b>Nigeria</b>	53.2	14.0	38.9
<b>Norway</b>	6.0	4.1	5.7
<b>Russia</b>	21.1	7.8	17.3
<b>Soudi Arabia</b>	43.9	0.1	4.5
<b>Venezuela</b>	23.7	1.0	6.0

# Illustration#5 Indicators

□ Policy makers do not have all the right tools

□ National accounts do not integrate natural capital,

□ GDP and other macro-indicators do not give the right signals



# Illustration#6: GDP of the Poor is most seriously impacted by ecosystem losses

□ 540 Million people engaged in farming, animal husbandry, informal forestry, fisheries....

□ ESS add “only 7.3%” to conventional GDP

*or*

□ ESS add 57 % to “GDP of the Poor”

□ Replacement of those ESS is beyond the capacity of the poor : they would need to spend twice their incomes

## Illustration #7: Many economic activities affecting flow of ecosystem services and societal welfare

1. Subsidies causing overfishing
2. Export causing loss of biodiversity and land use change (aquaculture)
3. Devaluation of Exchange rate causing soil erosion

Identification of effect and effectiveness of the causality would require macroeconomic analysis in General Equilibrium Framework

## Need II: Justify Efficient Allocation of Competing Resources

1. Provide Rationale for Investible funds in Conservation Measures (e. g. Extended Cost Benefit Analysis)
2. Design Cost Effective Response Policies (e.g. PES)
3. Alter the set of options available to the public to balance development and Conservation(e.g. Market Based Instruments (MBIs))

**Microeconomic Theory Based Environmental / Ecological Economics**

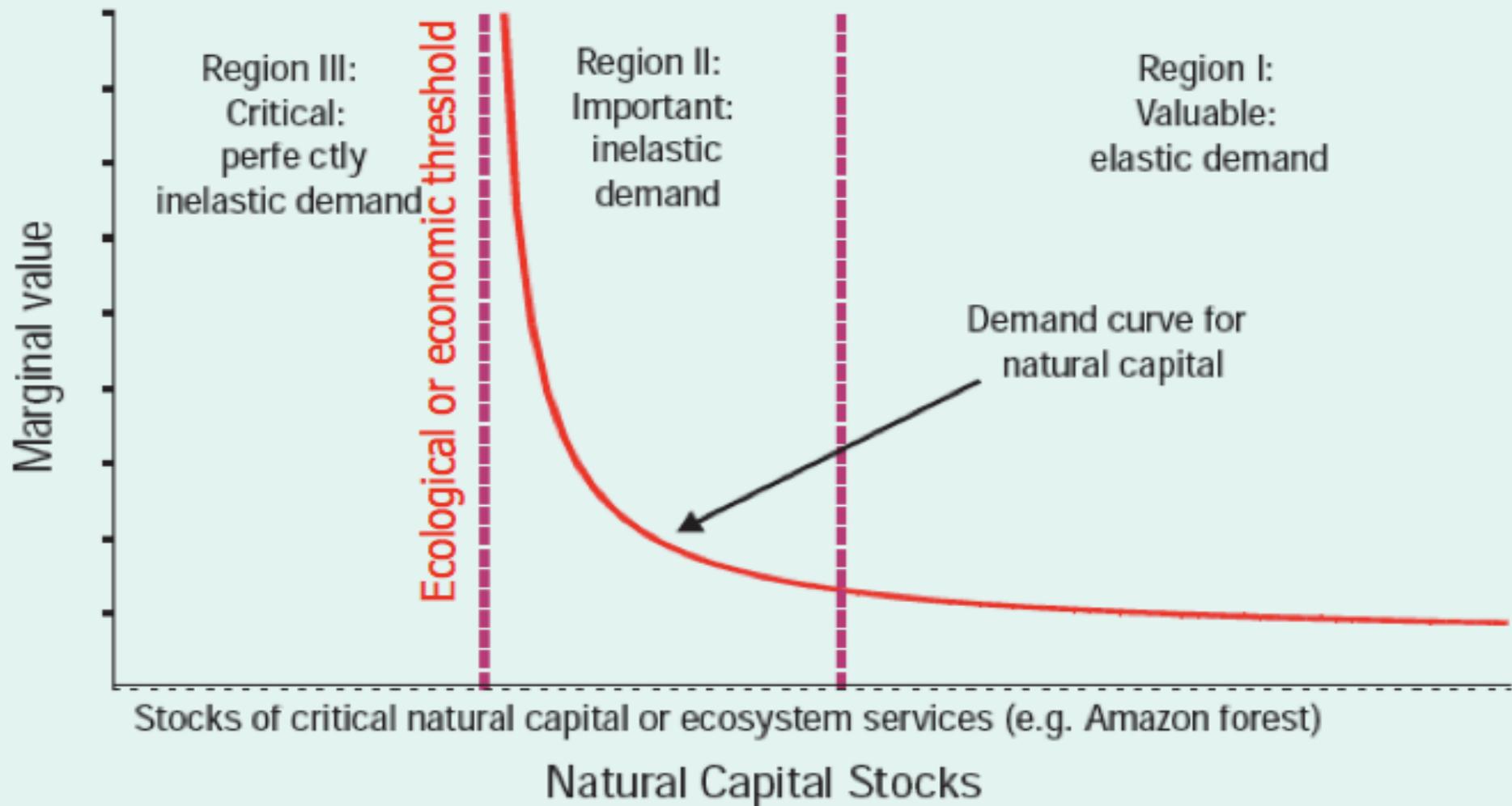
# Illustration#1: Aid to Decision Making Tools

Ecosystem	Typical cost	Avg. benefit	NPV	IRR	BCR
Coral	542,497	129,245	1,165,988	7%	2.8
Coastal	232,674	73,852	935,379	11%	4.4
Mangroves	2,876	4,346	88,297	40%	26.8
Inland wetlands	33,007	14,245	171,296	12%	5.4
Lakes / rivers	4,032	3,803	69,687	27%	15.5
<b>Tropical forest</b>	<b>3,448</b>	<b>7,022</b>	<b>148,675</b>	<b>50%</b>	<b>37.3</b>
Temperate forests	2,387	1,618	26,273	20%	10.3
Woodland / shrubland	987	4,343	97,696	85%	84.3
Grasslands / rangelands	257	1,012	22,624	79%	75.1

	Ecosystem	Typical cost	Avg. benefit	NPV	IRR	BCR
	<b>Tropical forest</b>	<b>3,448</b>	<b>7,022</b>	<b>148,675</b>	<b>50%</b>	<b>37.3</b>
1	<b>Benefits peak @ 70%, instead of 80% of Generic</b>				<b>42%</b>	<b>31.5</b>
2	<b>Costs @ 100%, instead of 120% of Typical</b>				<b>57%</b>	<b>45.4</b>
3	<b>Maintenance Cost (10%) stops after 5 years</b>				<b>51%</b>	<b>40.0</b>
4	<b>Benefits flows accounted for 50 yrs, instead of 40</b>				<b>50%</b>	<b>45.4</b>
5	<b>Discount rate 4%, instead of 1%</b>				<b>50%</b>	<b>21.7</b>

# Illustration#2: Valuation in the appropriate range can yield helpful policy tool

## Valuation helpful in realistic range of analysis (II)



# Illustration#3 : Contd.. (Methodological Tools).

## Valuation Tools (Quantitative)

Market price approaches  
Market cost approaches  
Replacement costs approaches  
Damage cost avoided approaches  
Production function approaches  
Revealed preference methods  
Travel cost method  
Hedonic pricing method  
Stated preference methods  
Choice modelling  
Contingent valuation  
Participatory approaches to valuation  
Deliberative valuation  
Mediated modelling

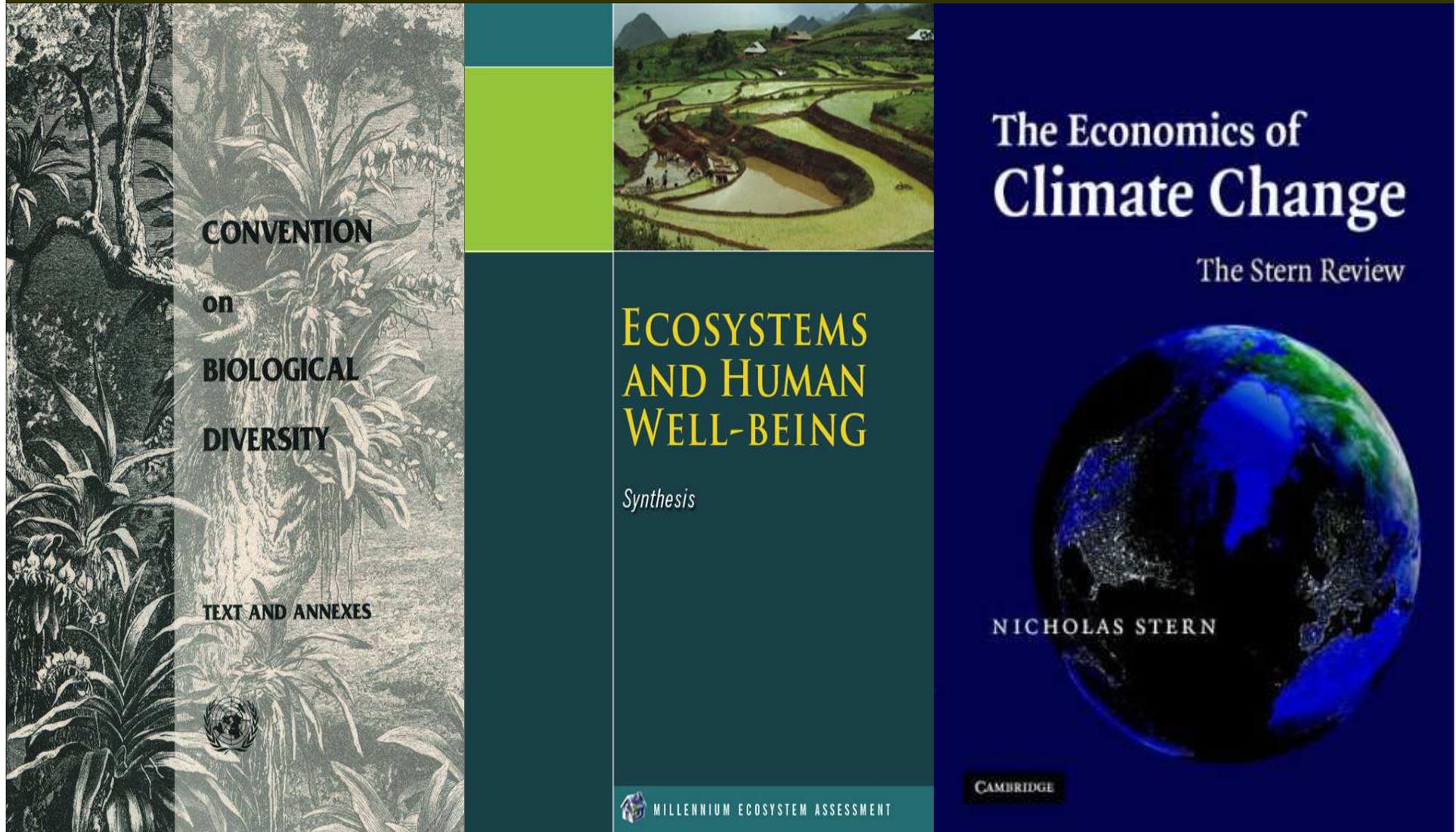
## Valuation Tools (Qualitative)

Consultative methods:  
Questionnaires  
In-depth interviews  
Deliberative and participatory approaches:  
Focus groups, in-depth groups  
Citizen juries  
Health-based valuation approaches  
Q-methodology  
Delphi surveys  
Rapid rural appraisal  
Participatory rural appraisal  
Participatory action research  
Methods for reviewing information:

## **Need III: Changing Context of Science-Policy Interface**

1. Greater Acceptability of Economics of Ecosystem Services Economics
2. Embracement of Response Policies like PES, Ecosystem Accounting, Changing Dynamics of Poverty and Ecosystems by the National Governments
3. Global Conventions (ABS by the CBD; Wetland Banking by Ramsor, Priority setting by UNCCD, Carbon Offset and REDD+ by the UNFCC to name a few) find Economic Analysis of Ecosystem services helpful

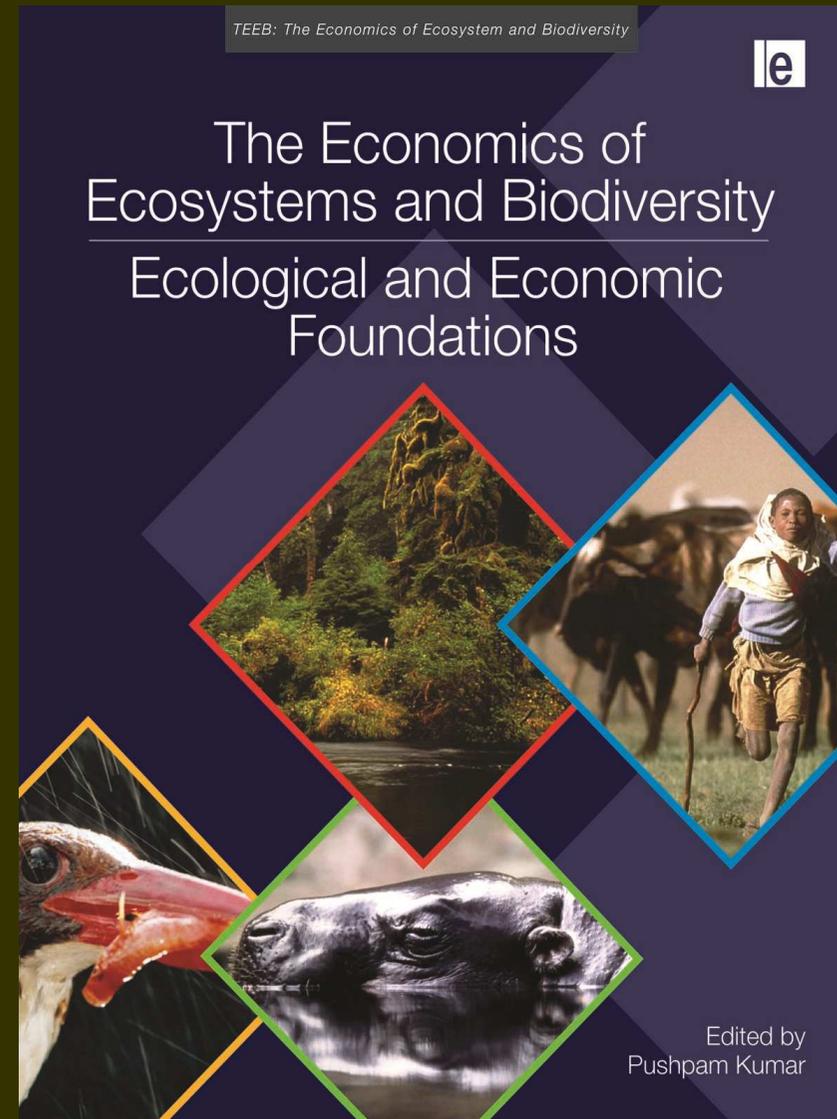
# Illustration#1: Genesis and Emerging Global Policy Context



# Illustration#1 Contd..

Now TEEB..

**Potsdam 2007: meeting of the environment ministers of the G8 countries and the five major newly industrialising countries**



# **Illustration #2: Evidence base to Management of ES for Poverty Alleviation (Ecosystem Services for Poverty Alleviation under LWEC of DFID, NERC and ESRC in UK)**

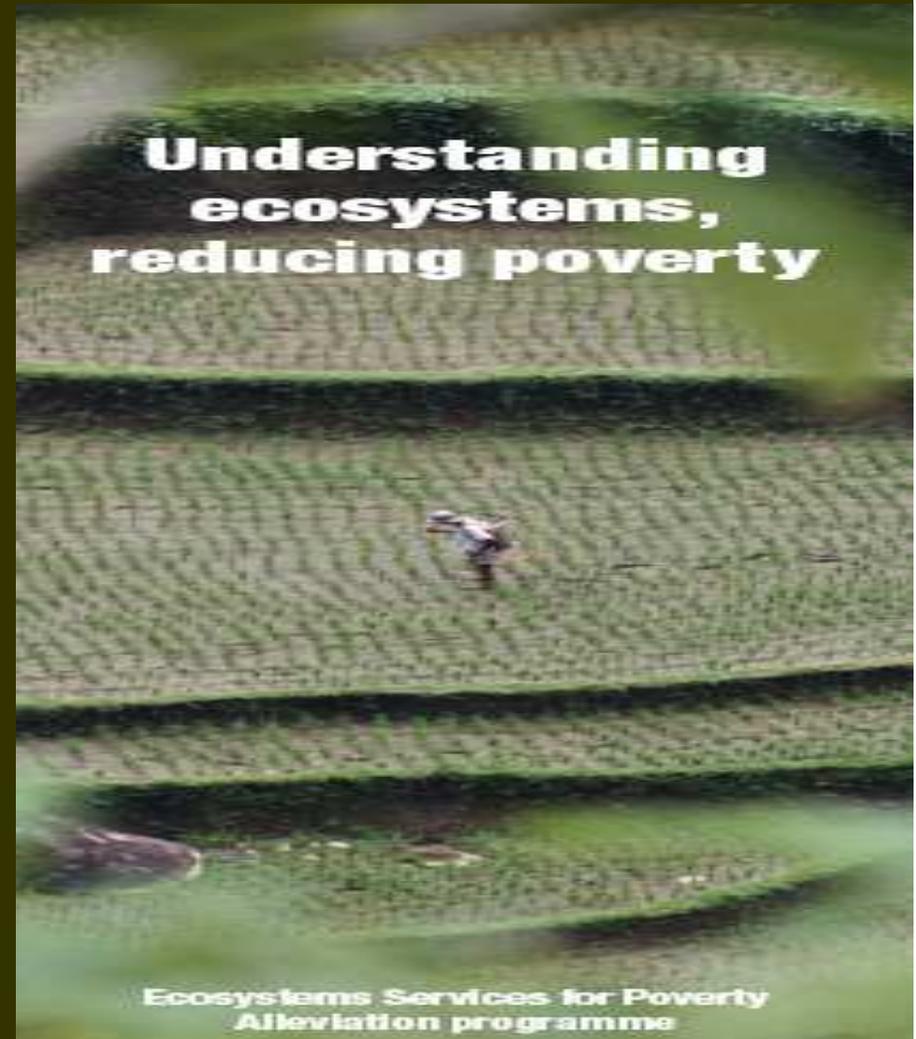
Provide better understanding...  
Strengthen the capacity...  
Influence national policy...  
Provide recommendations....

## **Disciplinary elements:**

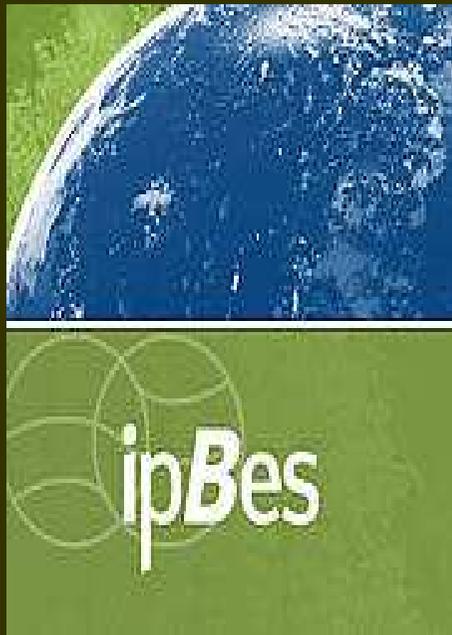
Environmental Science  
Ecological Economics  
Political Science

## **Target regions:**

Africa, China, South Asia, Amazon,  
Marine and Desakota



# Illustration#3: Other Influential Initiatives....



<http://www.naturalcapitalproject.org/>

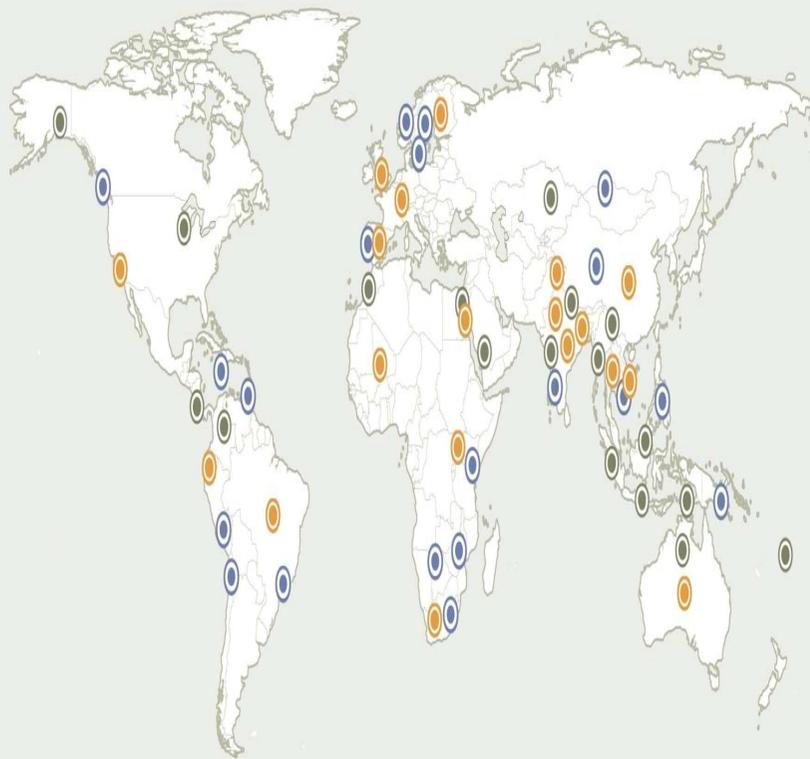


**Stockholm Resilience Centre**  
Research for Governance of Social-Ecological Systems



# Illustration4: Contd..Sub Global Assessments (SGAs) and Others

A network of sub-global assessments was created under the overall MA Follow-up Programme to favouring crossfertilization and sharing experiences among SGA practitioners, as well as to enhancing links between sub-global activities and international processes

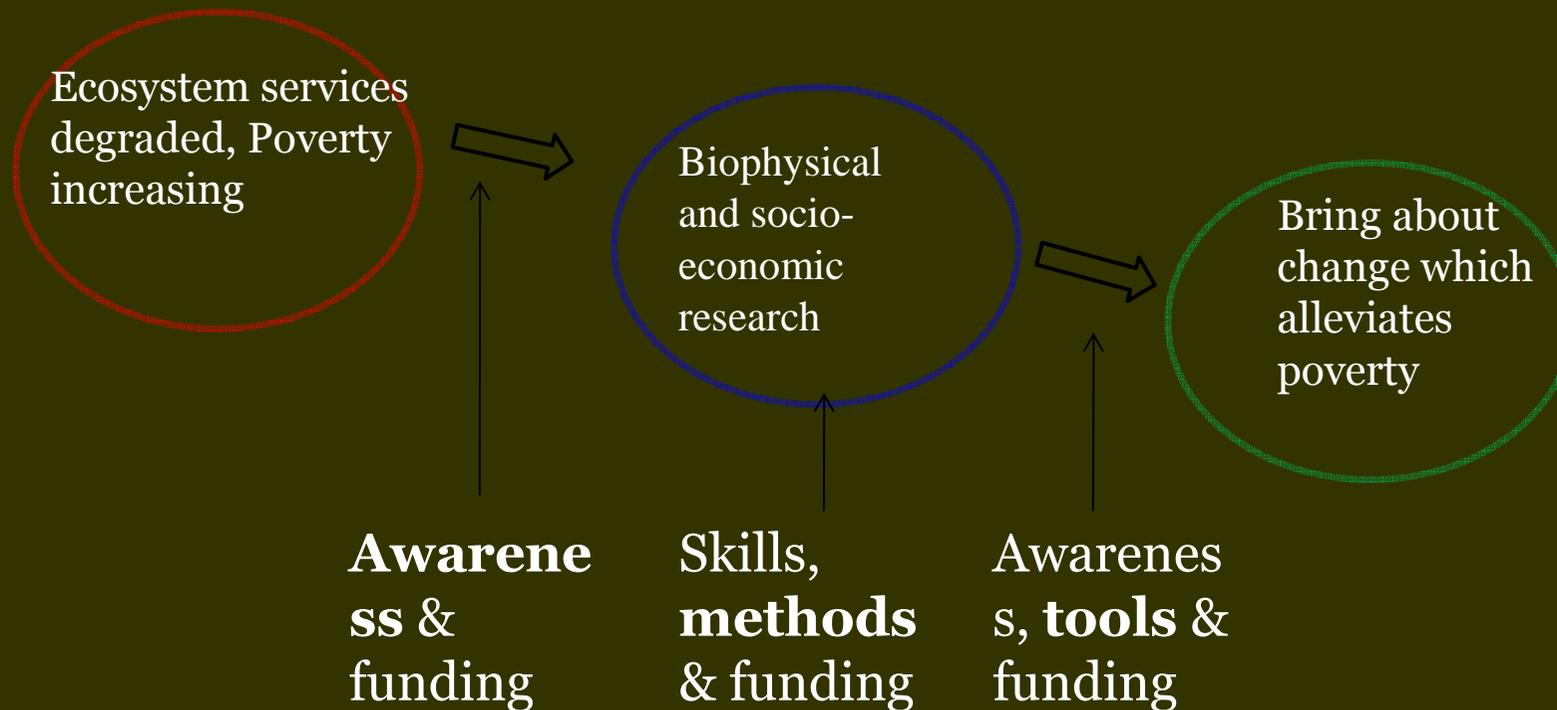


## UK National Ecosystem Assessment

The NEA is an inclusive process, many government, academic, NGO and private sector institutions are helping to design the assessment, contribute information and analyses, review the preliminary findings, and promote the results.

# Need IV: Economics of Ecosystem Services for Poverty Alleviation

- Govt. Especially in Hot Spot of Poverty Regions
  - Need to strengthen international capacity to undertake ES and to apply findings in a decision-making context



Awareness+ Methods+ Tools = Economics of Ecosystem services

# Illustration #1: Paradigm Shift in Thinking

## ❖ Arguments supporting a poverty-environment downward spiral

Poverty increases environmental degradation (high discount rate, risk aversion, ill health, large family size)

Environmental degradation increases poverty (reduces stock of natural capital, vulnerability, cost of basic goods)

## ❖ Arguments against a poverty-environment spiral

Spurious correlations create wrong appearance of causality. Poverty and degradation jointly caused by many factors (credit market failures, insecure property rights, deficits in public goods like education, health).

Poverty need not be a source of resource degradation (non-poor main source of degradation, sustainable technologies,).

## Alternate Thinking

✓ **Increase poor people's access** to natural resources essential to their livelihoods; enhancing their entitlement

Work towards **creating capability** of the poor in multi dimensional space to increase the **productivity** of their natural resources;

✓ **Create markets** for ecosystem services (PES) provided by poor farmers and communities (e.g. fresh water, biodiversity, carbon sinks).

## **Summarily,**

- 1. Valuing Ecosystems and Biodiversity -opportunities for policy response**
- 2. Investing in ecological infrastructure / natural assets -helps climate change mitigation/adaptation**
- 3. Informed choices – Efficiency, cost effectiveness and inclusive assessment**
- 4. People depend on natural capital – social benefits & equity, ethics and moral responsibilities**
- 5. Towards efficiency and fairness in a new green economy- opportunities for action - international and national**

**Economics of Ecosystem  
Services is Critical to fulfill  
those Needs**