

# Green Accounting and its implications for development policy

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# How good a measure of citizens' Well-being is *GDP Growth* ? .... some examples

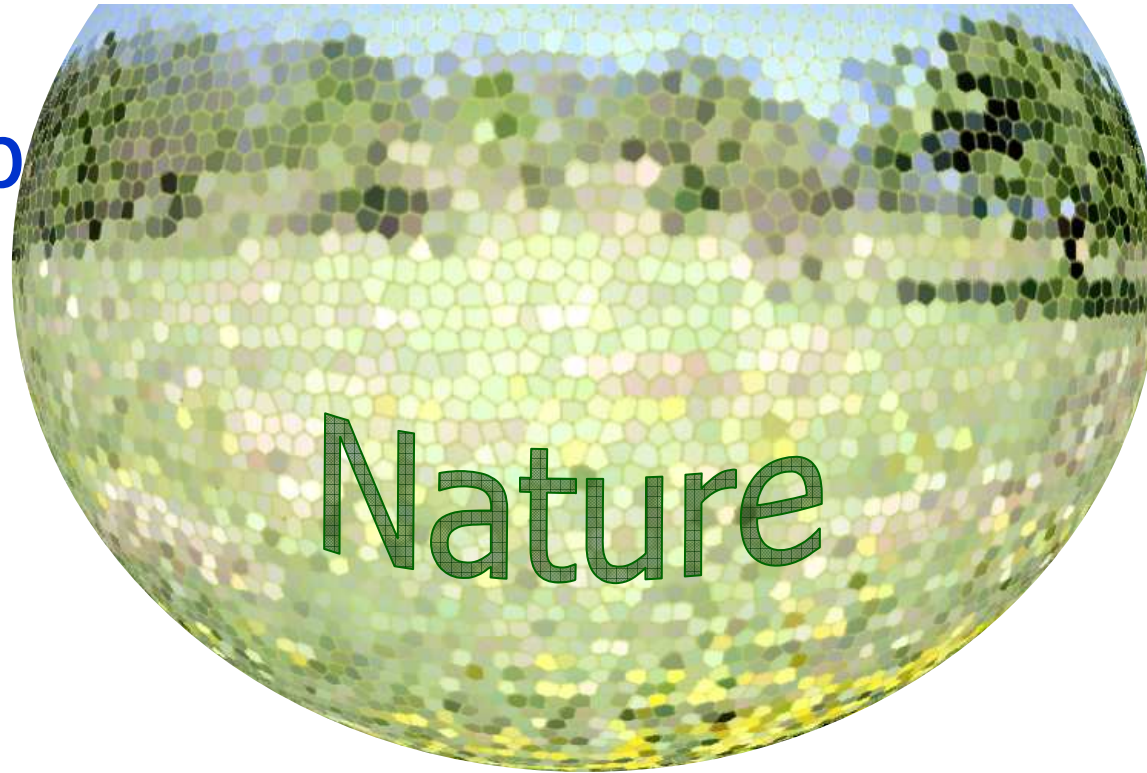
- The following ARE included in computed "GDP growth" :-

- increase in government and private spending on flood damage & drought losses
- increase in medical spending on respiratory diseases
- increase in spending on school & university buildings
- the repair and reconstruction activity after the Tsunami

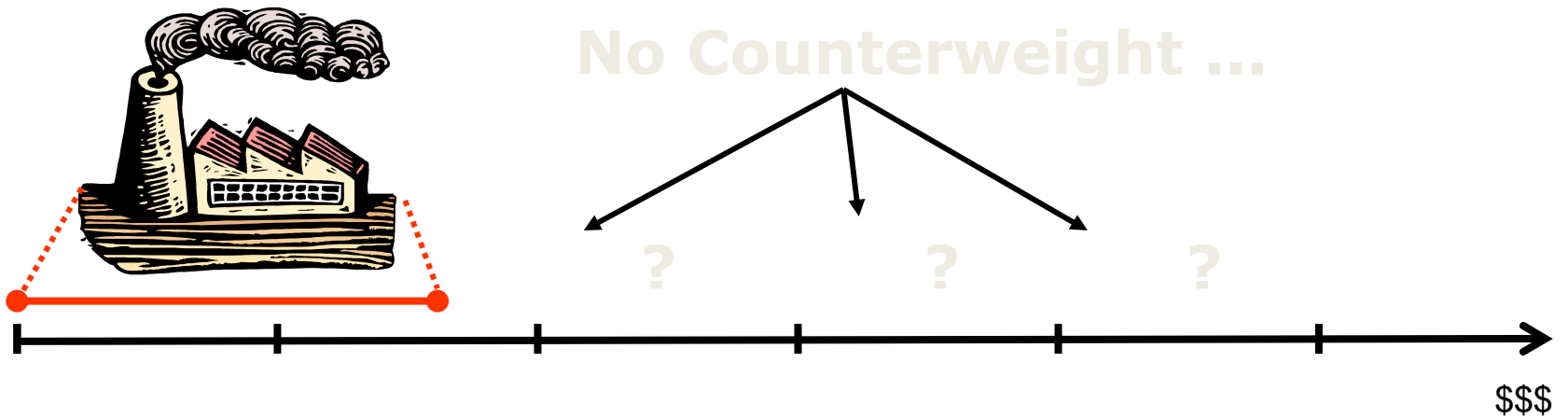
- But the following are NOT included in computed "GDP growth" :-

- reduction of flood damage & and drought losses by increasing forest density & forest cover
- reduction of ambient air pollution by legislating cleaner fuels & greener cities
- increase in human capital (i.e. earnings potential) through education
- the loss of lives and livelihoods due to the Tsunami

The p



No Value =  
No Counterweight ...



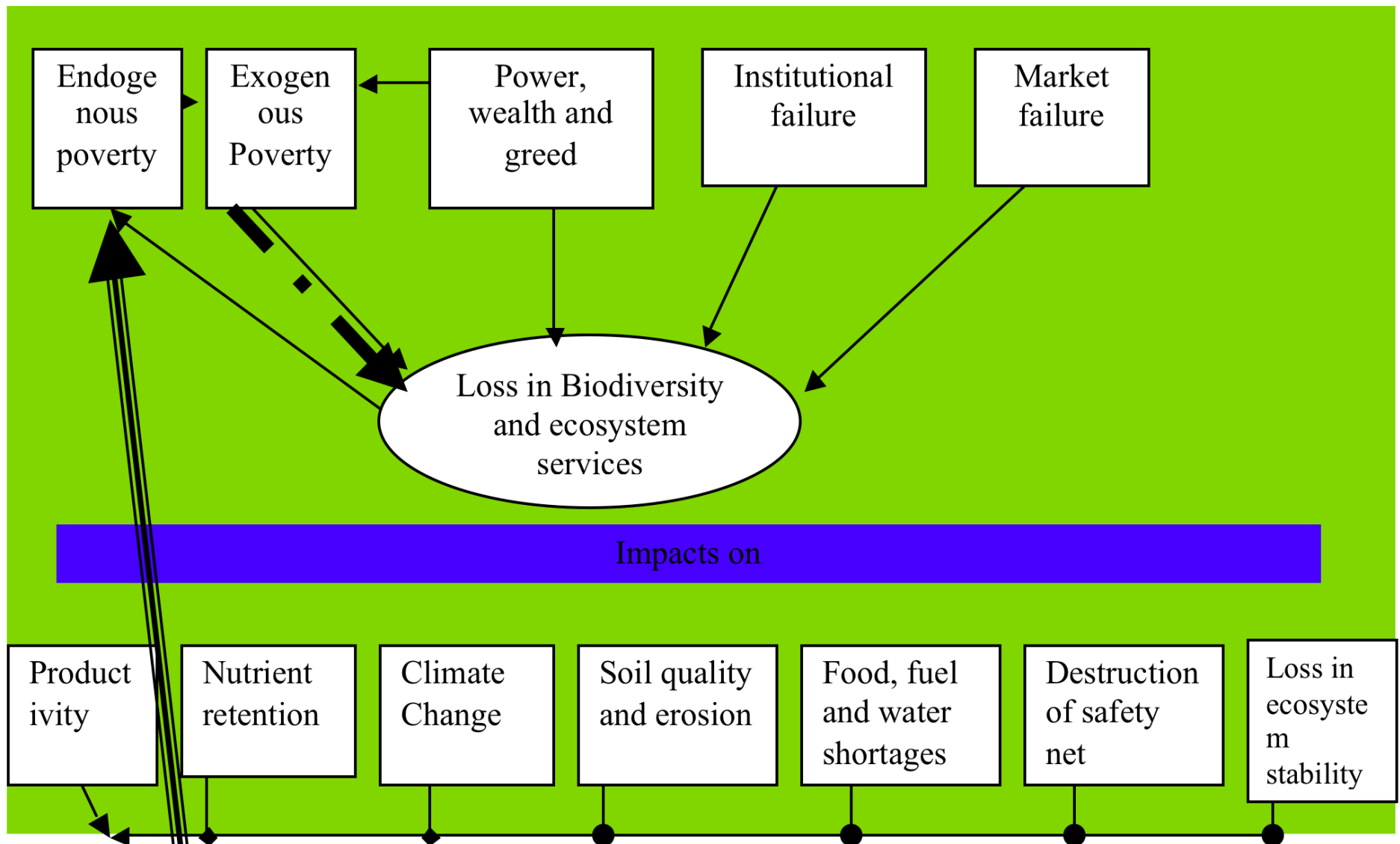
## **Dependence of poor households on natural resources for the livelihoods**

- **Bangladesh** - more than 95 per cent of the population relies on solid fuels for their energy needs.
- **Bolivia** - over 80 per cent of the people living in rural areas are poor, making them vulnerable to the environment on which their livelihoods rely.
- In **Burkina Faso**, 92 per cent of the active workforce are employed in agriculture and fisheries,
- Source: UNDP et al. 2005 as quoted in UNEP-PEI

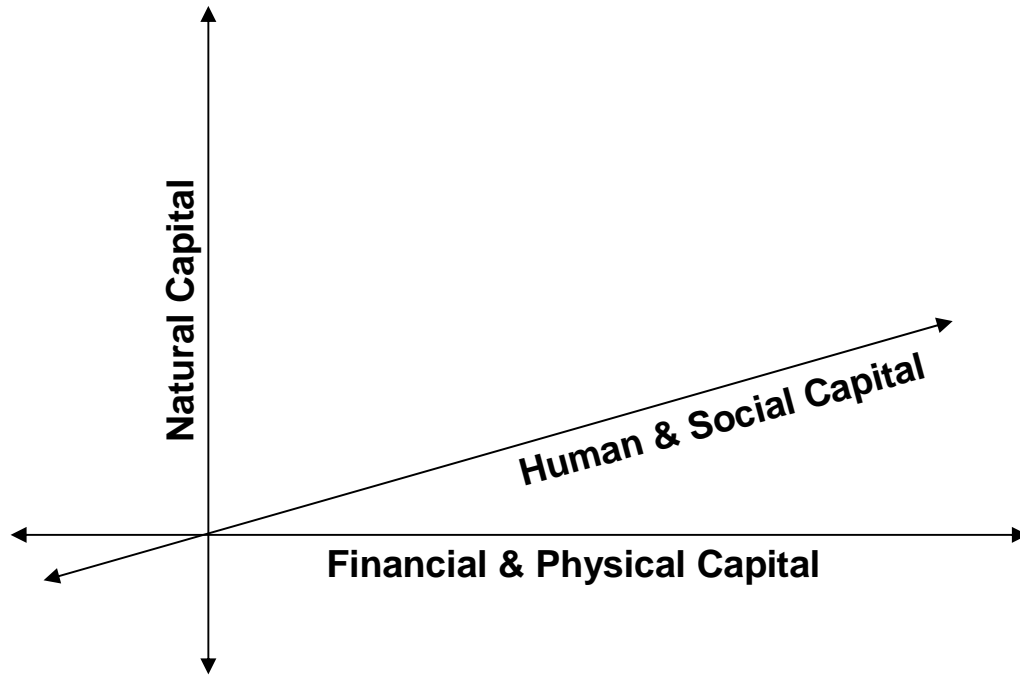
# Why lack of proper accounting system matters to the poor?

- Traditional GDP-growth-led development paradigm excludes ecosystem service flows and biodiversity benefits
- Results in a lack of policy attention and public investment in ecosystem and biodiversity conservation
- The second tragedy, is an implicit assumption that an increase in any measure of average progress) can reflect progress in the *distribution* of well-being within society at large.

## Poverty and Loss in Biodiversity – a downward spiral



# Navigation Challenge Ahead !



❑ *Can we navigate a complex, 3-D economic space..... with a simple economic compass ?*

## **Important - How we measure what we value?**

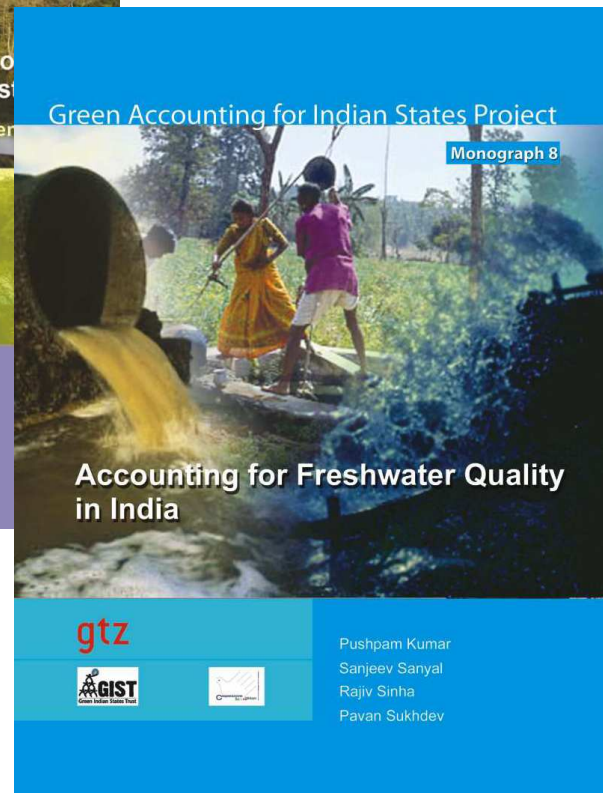
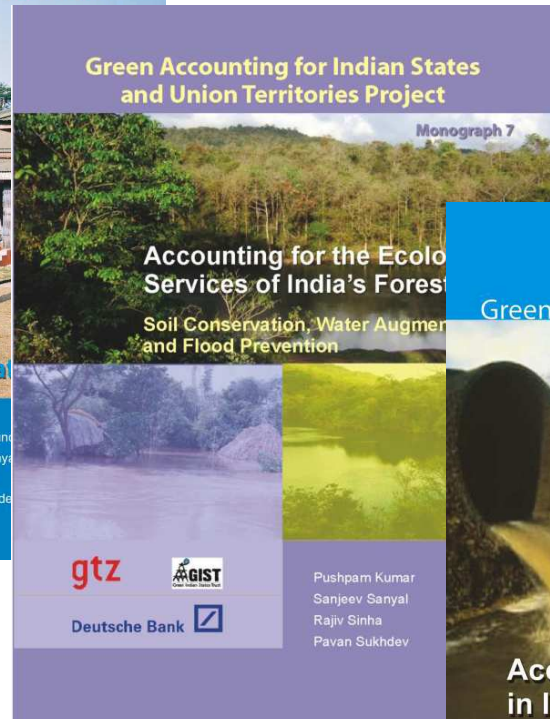
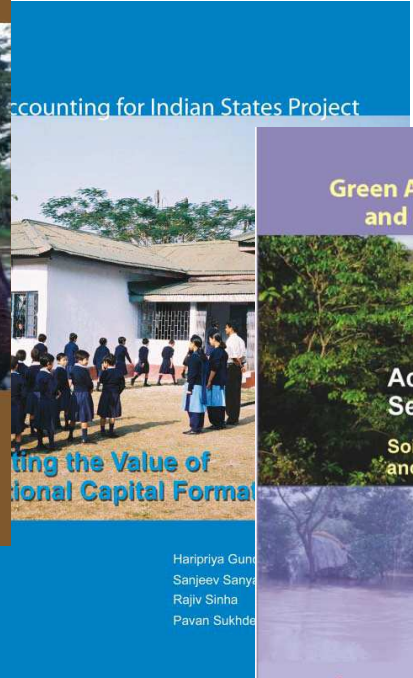
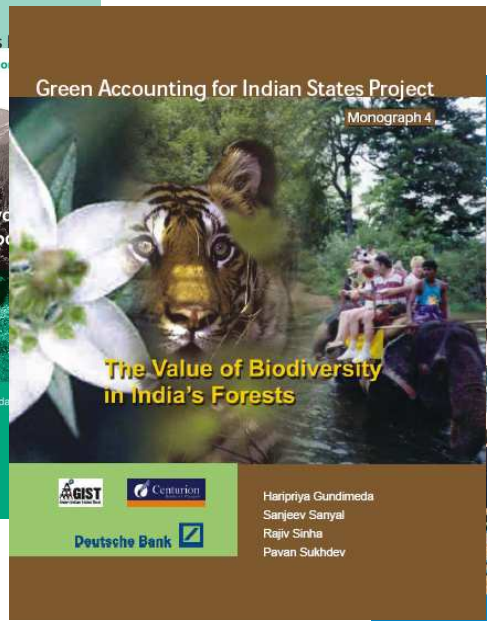
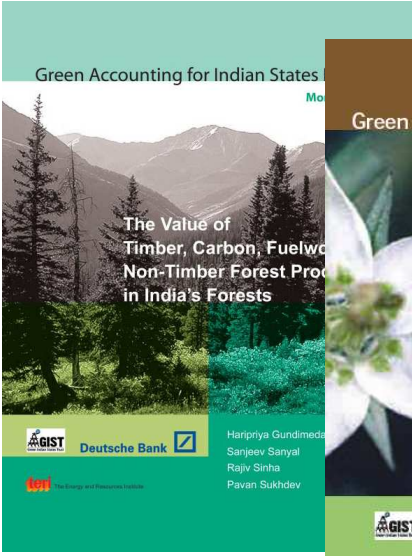
*Improving Measurement can be a long process, but of fundamental importance to being able to obtain a solution (TEEB, D1, chapter 3))*

## Sustainable measurement need of the hour

- Economic assets – Natural assets
- Infrastructure – Green infrastructure
- Gross fixed capital formation – Natural capital formation
- Trade deficits – Green deficits
- National net savings – Genuine savings
- National Accounts – Satellite Accounts for nature
- GDP – EDP
- **There is a natural counterpart to many of our economic measures, which is equally important, yet we do not take it into account. This must change to achieve true sustainable development (TEEB, D1, Chapter 3)**

# Introducing GIST's "Green Accounting for Indian States Project" (GAISP, 2003 – 2008)

**"GAISP" ...THE PRODUCT**  
**Eight Monographs....**



**"GAISP" ....THE TEAM**

- Dr. Haripriya Gundimeda**
- Dr. Pushpam Kumar**
- Prof. Rajiv Sinha**
- Pavan Sukhdev**
- Sanjeev Sanyal**
- P. Yesuthasan**

# Green Accounting Project for India - *GAISP*

## GAISP Mission

provide a sustainability framework for State Governments in India so they can “measure what they manage” and make informed trade-offs while evaluating policy choices

## GAISP Objectives (‘Phase 1’)

- **Design a framework for Green Accounting in India which reflects the latest research and is comprehensive, unbiased, top-down, practical and policy-relevant enough to answer to the question : “Is this State growing in a sustainable manner ?”**
- **Calculate one full set of adjustments to GSDP for all states across all key unaccounted wealth components, and thus kick-start an annual process of producing Adjusted GSDP Accounts**
  - **Prepare the ground for ‘Phase 2’ ....**

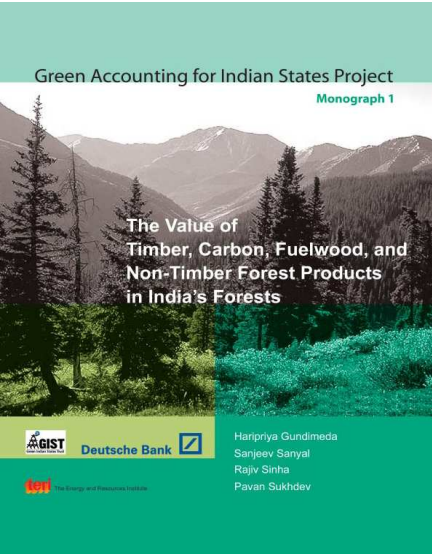
## Example from India GAISP project for forests

- Opening stocks
- Changes due to economic activities
- Other Changes
- Closing stocks

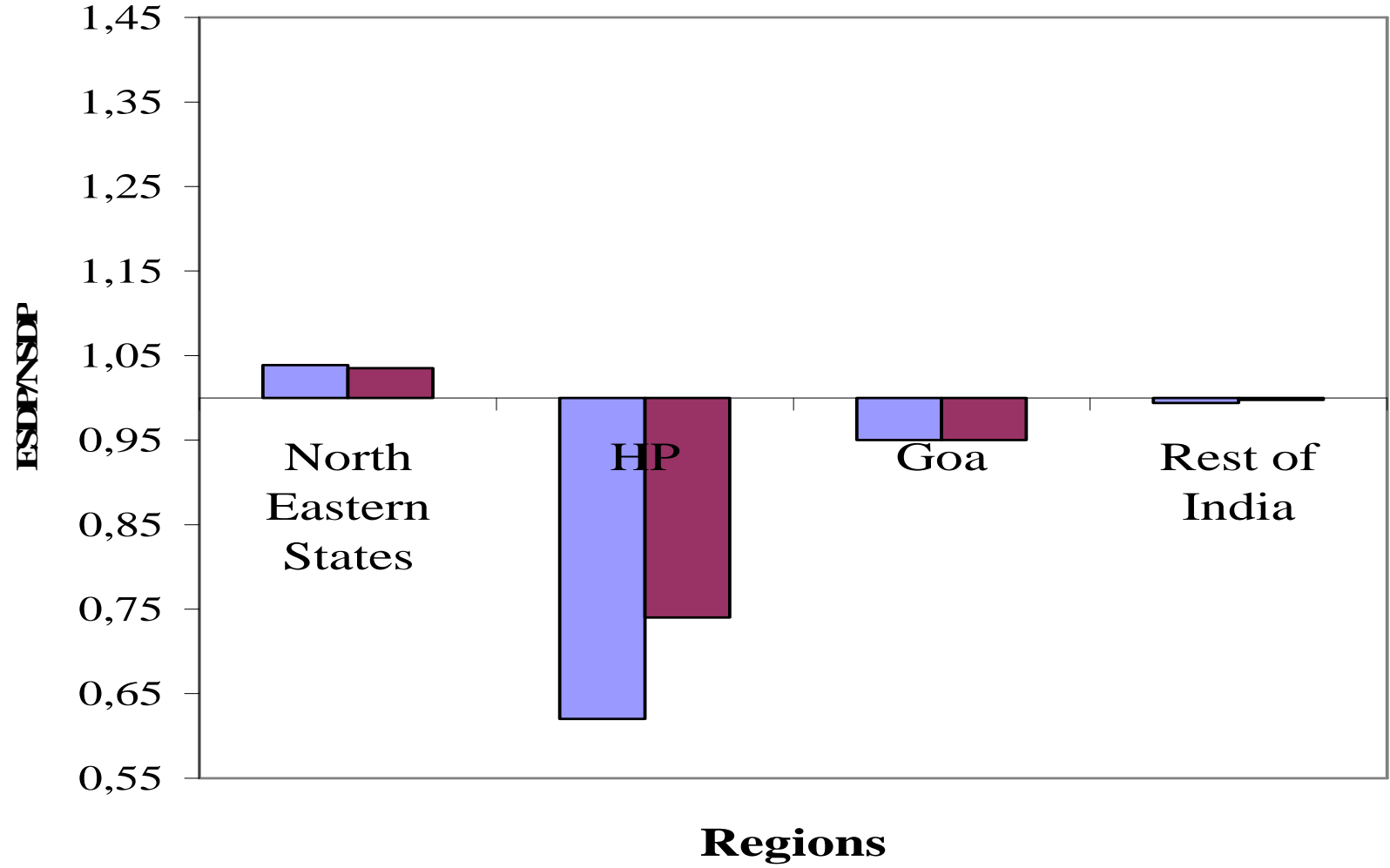
Detailed components for forestland, timber and carbon are slightly different for each

Total economic value (Timber, fuelwood, fodder, nontimber forest products, carbon, ecotourism, biodiversity, ecological values)

Monetary accounts



# Depletion Adjusted NSDP (ESDP) to NSDP



- ESDP/NSDP using net price method
- ESDP/NSDP using weighted net price method

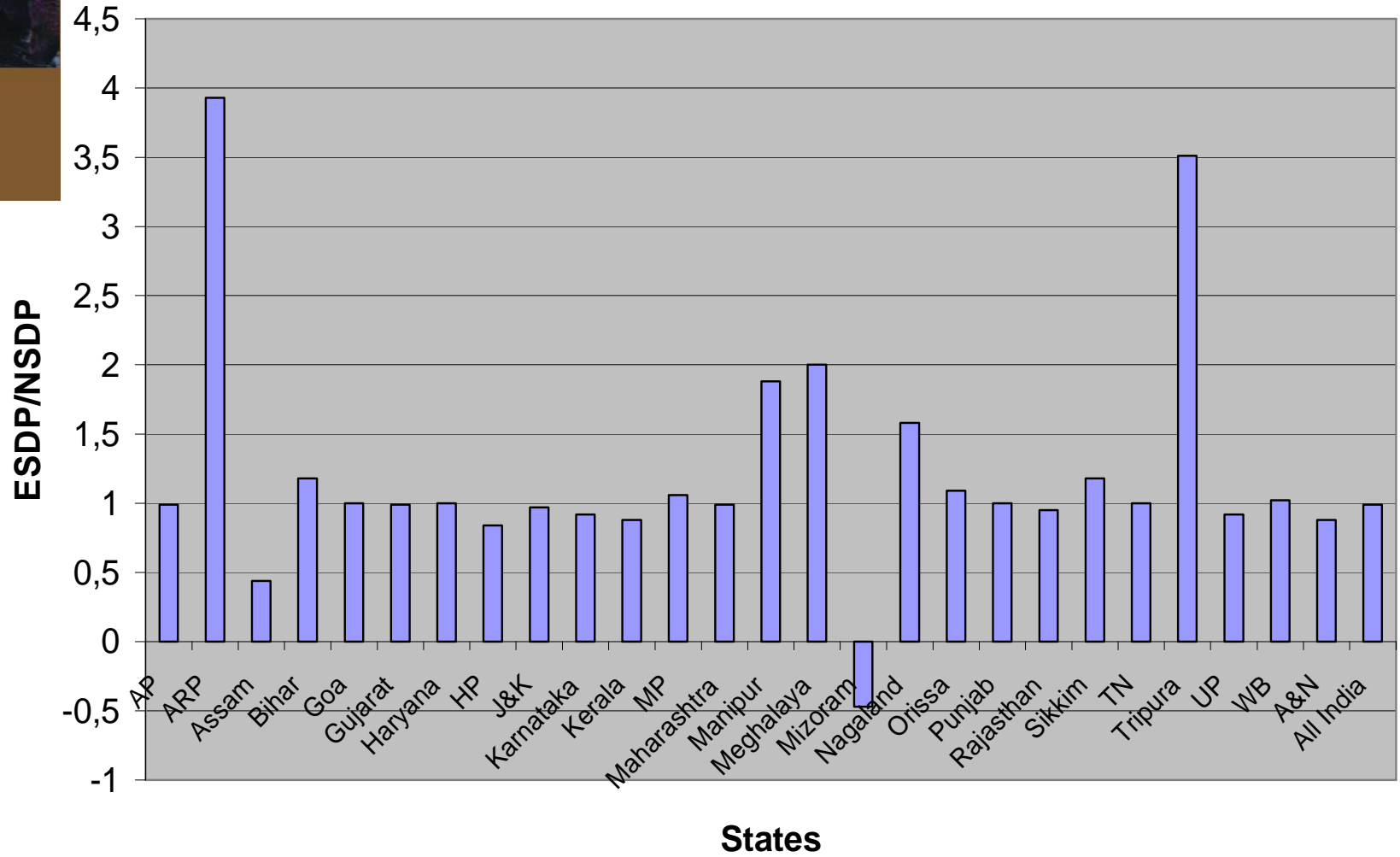
The Value of Biodiversity  
in India's Forests



Hanpriya Gundimeda  
Sanjeev Sanyal  
Rajiv Sinha  
Pavan Sukhdev



### ESDP/NSDP



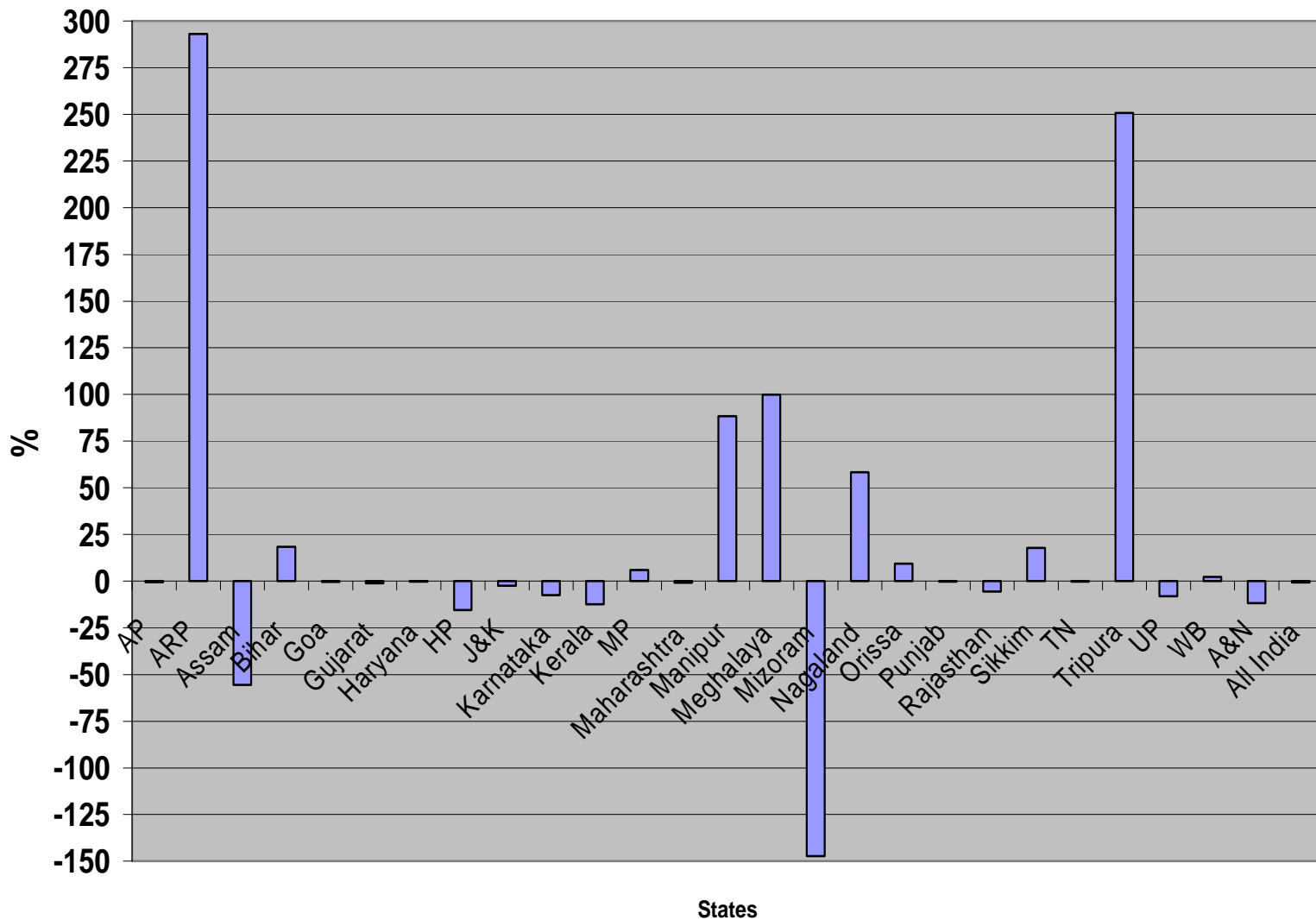
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### Loss as % of NSDP



## India's Natural Resource Losses, measured in GDP terms

( Net Resource Loss Adjustments as % of Gross State Domestic Product ; 2002-03 ; "Floor values")

| Natural Resource<br>State | Fresh-<br>water       | Forest<br>Biomass                              | Forest Bio-<br>diversity<br>(‘use values’<br>only) | Forest Eco-<br>Services                               | Capital<br>Loss<br>(as % of<br>GSDP) |
|---------------------------|-----------------------|--|--|---|--------------------------------------|
|                           | Freshwater<br>Quality | Timber, Fuel-<br>wood, Carbon<br>storage, NTFP | Eco-Tourism,<br>Bio-prospecting                    | Water storage,<br>Flood control,<br>Topsoil retention |                                      |
| <b>Bihar</b>              | <b>- 5.4 %</b>        | <b>- 4.7 %</b>                                 | <b>- 0.0 %</b>                                     | <b>- 0.4 %</b>  | <b>- 10.5 %</b>                      |
| <b>Himachal</b>           | <b>- 9.7 %</b>        | <b>- 2.0 %</b>                                 | <b>- 7.8 %</b>                                     | <b>- 7.4 %</b>  | <b>- 26.9 %</b>                      |
| <b>Goa</b>                | <b>-17.6 %</b>        | <b>+0.4 %</b>                                  | <b>-1.7 %</b>                                      | <b>- 5.1 %</b>  | <b>-24.0 %</b>                       |
| <b>Uttar Pradesh</b>      | <b>- 17.5 %</b>       | <b>- 0.1 %</b>                                 | <b>-1.4 %</b>                                      | <b>- 1.8 %</b>  | <b>-20.8 %</b>                       |
| <b>India</b>              | <b>-3.4 %</b>         | <b>+0.4 %</b>                                  | <b>-1.7 %</b>                                      | <b>+0.5 %</b>   | <b>- 4.2 %</b>                       |

Source : GIST's "Green Accounting for Indian States Project" (GAISP) Monographs # 1, 4, 7, & 8.

**Note** : for forest services, these are net 2002/03 GSDP adjustments, i.e. after positive adjustments for unaccounted service flows... i.e. stock losses from deforestation (net of re-growth) exceed flows

# Human Capital

Green Accounting for Indian States Project

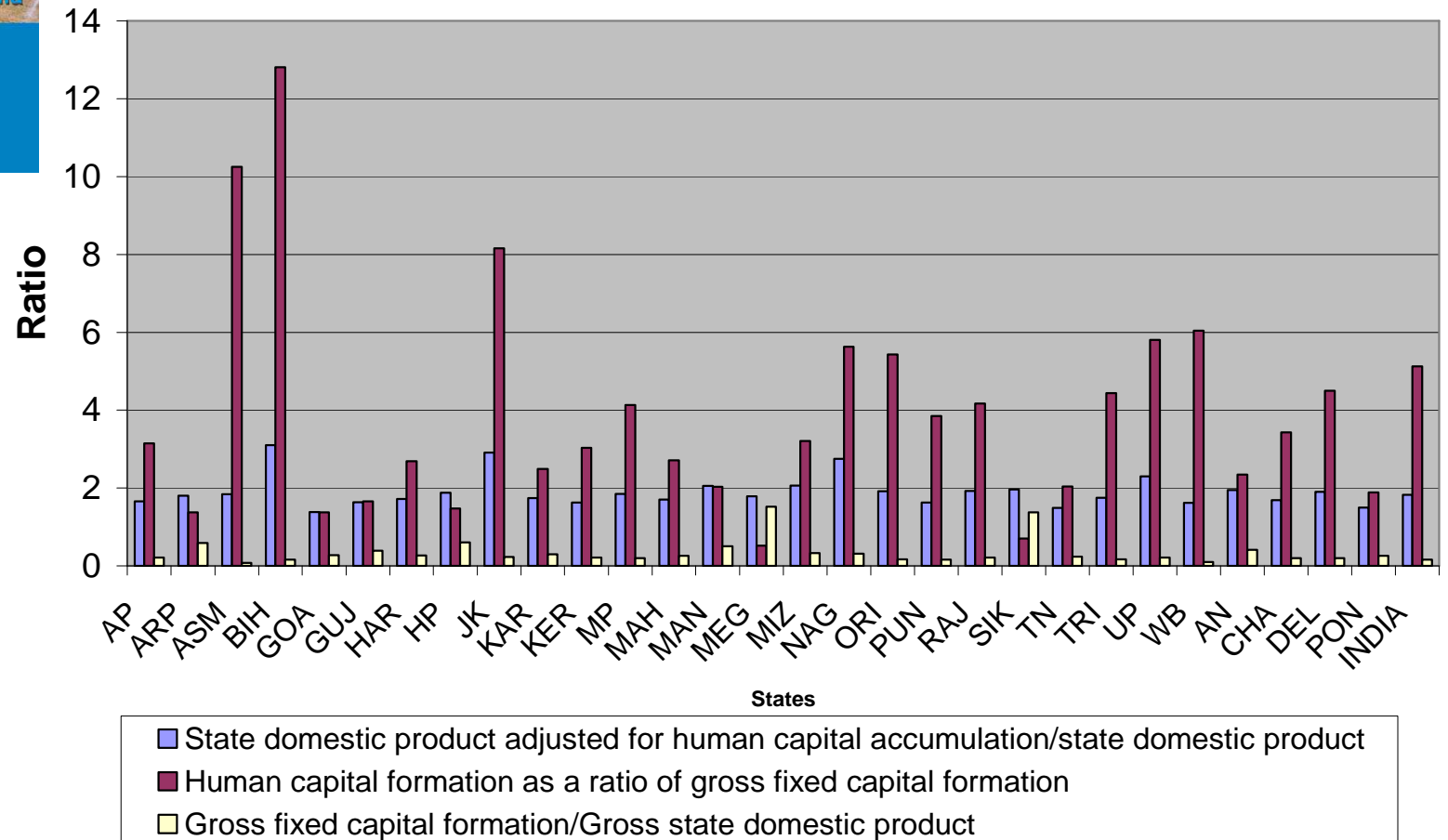
Monograph 5

Estimating the Value of Educational Capital Formation in India

Haripriya Gundimeda  
Sanjeev Sanyal  
Rajiv Sinha  
Pavan Sukhdev

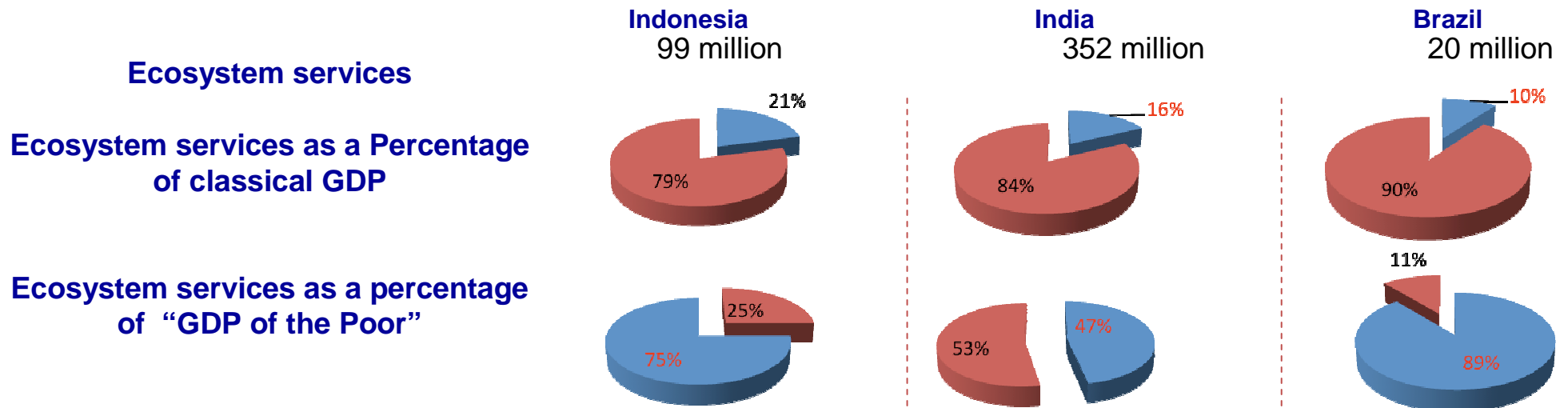


## Comparison with national accounting indicators (GSDP, HCF)



# GAISP ESTIMATES FOR INDIA USED TO ASSESS Ecosystem Losses & Poverty

“GDP of the Poor” is most seriously impacted by ecosystem losses:



Source: Gundimeda and Sukhdev, D1 TEEB

# Applications of “Green GDP”

- Some practical applications of our approach.....
  1. benchmarks for transfers between states (eg: Himachal /...) and between neighboring countries (eg: Nepal / India) through Payments for Ecosystem Services agreements (“PES”) for downstream water provision and regulation
  2. indicative sectoral returns on investment for areas not adequately reflected in National Accounts, to identify the biggest “bang for the buck” for society as a whole (eg : sectoral returns on Education, Forests, etc )
  3. benchmarks for calculating compensatory afforestation rates ...(eg : Supreme Court of India, CEC report, 2007)

# Benchmark for fiscal Transfers to states

- 13<sup>th</sup> Finance Commission in India had introduced a forest-related grant of Rs 1,000 crore to be distributed among the states in accordance with their share of the total forested acreage in the country.
- The THFC forest grant formula takes into consideration three factors
- – one, the share of the total forest area in the country in a particular state;
- 2) states where the share of forested area in their total area is greater than the national average; and
- 3) the quality of forests in each state, as measured by density.
- The forest grants are subject to a release and monitoring mechanism after the first two years.

# Per hectare value of forests based on GAISP calculations

| <i>Component</i>                        | <i>Value</i> |
|---|--------------|
| Value of Timber and fuelwood            | 1,52,830     |
| Value of NTFPs                          | 7631         |
| Value of fodder                         | 2958         |
| Value of eco-tourism                    | 65113        |
| Value of bioprospecting                 | 25553        |
| Value if ecological services of forests | 144332       |
| Value of flagship species               | 258400       |
| Carbon sequestration value              | 120780       |
| Total value of forest                   | 777597       |
| Average value                           | 800000/ha    |

Matrix showing NPV of the different eco-value / canopy density classes at estimated average NPV value of the country's forest as Rs. 800,000/- per ha.

| Eco-Value class | Very Dense Forest | Dense Forest | Open Forest |
|-----------------|-------------------|--------------|-------------|
| Class I         | 10,43,000         | 9,39,000     | 7,30,000    |
| Class II        | 10,43,000         | 9,39,000     | 7,30,000    |
| Class III       | 8,87,000          | 8,03,000     | 6,26,000    |
| Class IV        | 6,26,000          | 5,63,000     | 4,38,000    |
| Class V         | 9,39,000          | 8,45,000     | 6,57,000    |
| Class VI        | 9,91,000          | 8,97,000     | 6,99,000    |

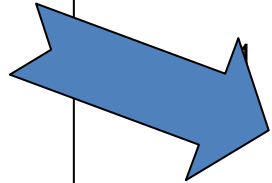
# Testimony of GAISP's impact

- “The value of the first six goods / services has been taken as provided in Annexure – RIII of CEC’s 11. report dated 16.10.2006. The carbon sequestration value has been assessed on the basis of the state-wise details of carbon in biomass of forest as assessed in the Green Indian States Trust (GIST) report (refer Table – 8 of the Monograph – I enclosed at Annexure-RII of the CEC’s report dated 16.10.2006) and taking the monetary value of CO<sub>2</sub> @ US \$ 20/tonne, which has been arrived at on the basis of the EUA future prices (**ANNEXURE-RS-IX**). **The state-wise details of the carbon sequestration value are enclosed at ANNEXURE-RS-X to this report. The value of the flagship species in respect of forest area outside the National Park and Wildlife Sanctuary, done on the basis of the valuation done in the GIST report and by assuming that 30% of the Royal Bengal Tiger, 50% of the Asian Elephant, 10% of the one horned rhino and 0% of Asian Lion are found outside the National Park / Sanctuary and that the value of other flagships / charismatic species is at least equal to those of these four assessed species, is enclosed at ANNEXURE- RS-XI to this report.”**
- **Source: CENTRAL EMPOWERED COMMITTEE**  
[http://164.100.194.13/allied\\_forclr/htmls/CECReport/ReportofCEC.htm](http://164.100.194.13/allied_forclr/htmls/CECReport/ReportofCEC.htm)

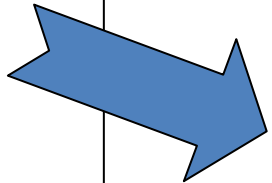
# Implications for development policy

- The development paradigm should take into account the nexus between growth, poverty and environment.
- Greening the accounts is a way to recognise contribution of natural resources
- Along with this we also need to use a sectoral GDP measure which is focused on and adapted to their livelihoods.
- **At a micro-level, the inclusion of ESS increases the estimate of effective income and well-being of the rural and forest poor**
- It is clear that where natural capital is being lost, the rural poor are even less well off
- The issue of the rural poor's dependency on income from non-market products and services is a critical one to factor into policy-making.

## Aligning with the objectives of PEP ... Environmental management should be viewed as part of development concerns



**The environmental quality of growth matters to poor people.** The poor depend more immediately on clean water, fertile soils, etc, than other groups. Ignoring the environmental sustainability of growth – even if it reaps short-run gains – can undermine growth itself and its effectiveness in reducing poverty.



**2 Environmental management cannot be treated separately from other development concerns.** Improving environmental management in ways that benefit poor people requires policy and institutional changes that cut across sectors. These lie mostly outside the control of environmental institutions.

**3 Poor people must be seen as part of the solution rather than part of the problem.** If environmental management is to contribute to sustainable growth and poverty reduction, it should reflect the priorities of the poor.”

# Pro-development opportunities through improved accounting for environment

- Recognition of the importance
- Fiscal transfers and compensation
- EGS link with building ecological infrastructure – job opportunities and improved livelihoods
- Payment for ecosystem services
- Sustainable income generation models involving the poor

**THANK YOU**