

# Value, Monetize and Incentivize – An Effective Path to Conserving Ecosystem Services?

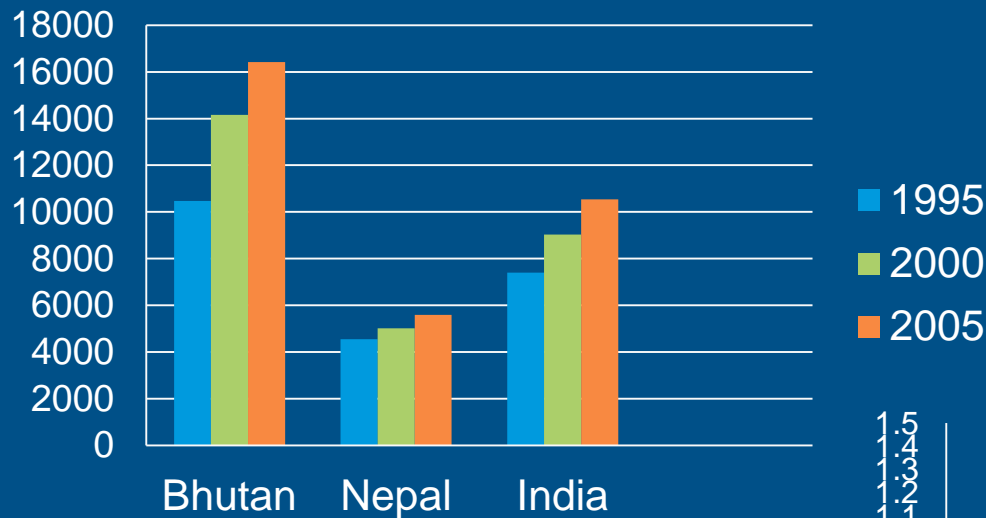
**Priya Shyamsundar**

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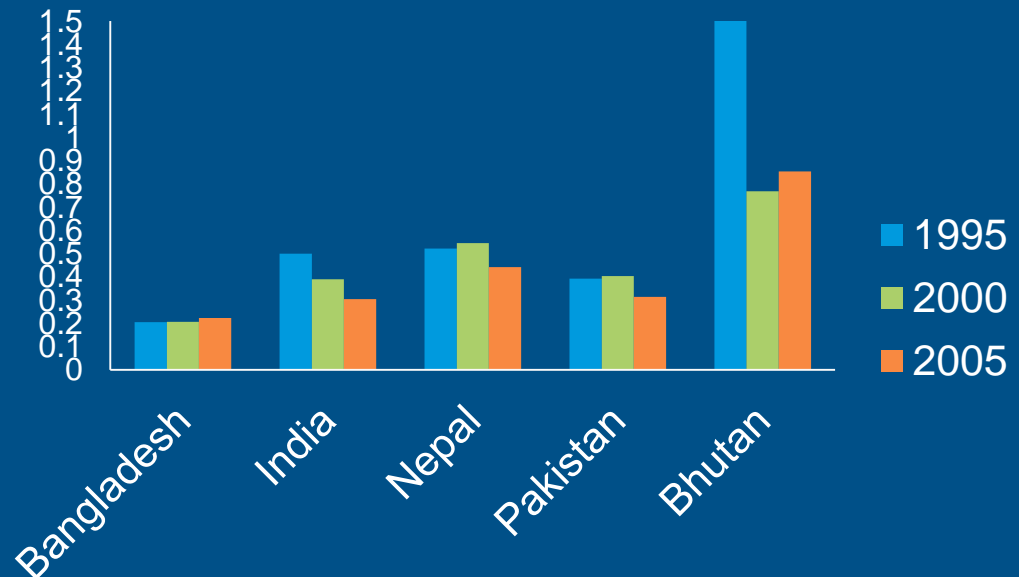
South Asian Network for Development and Environmental Economic

# Wealth Estimates (World Bank)

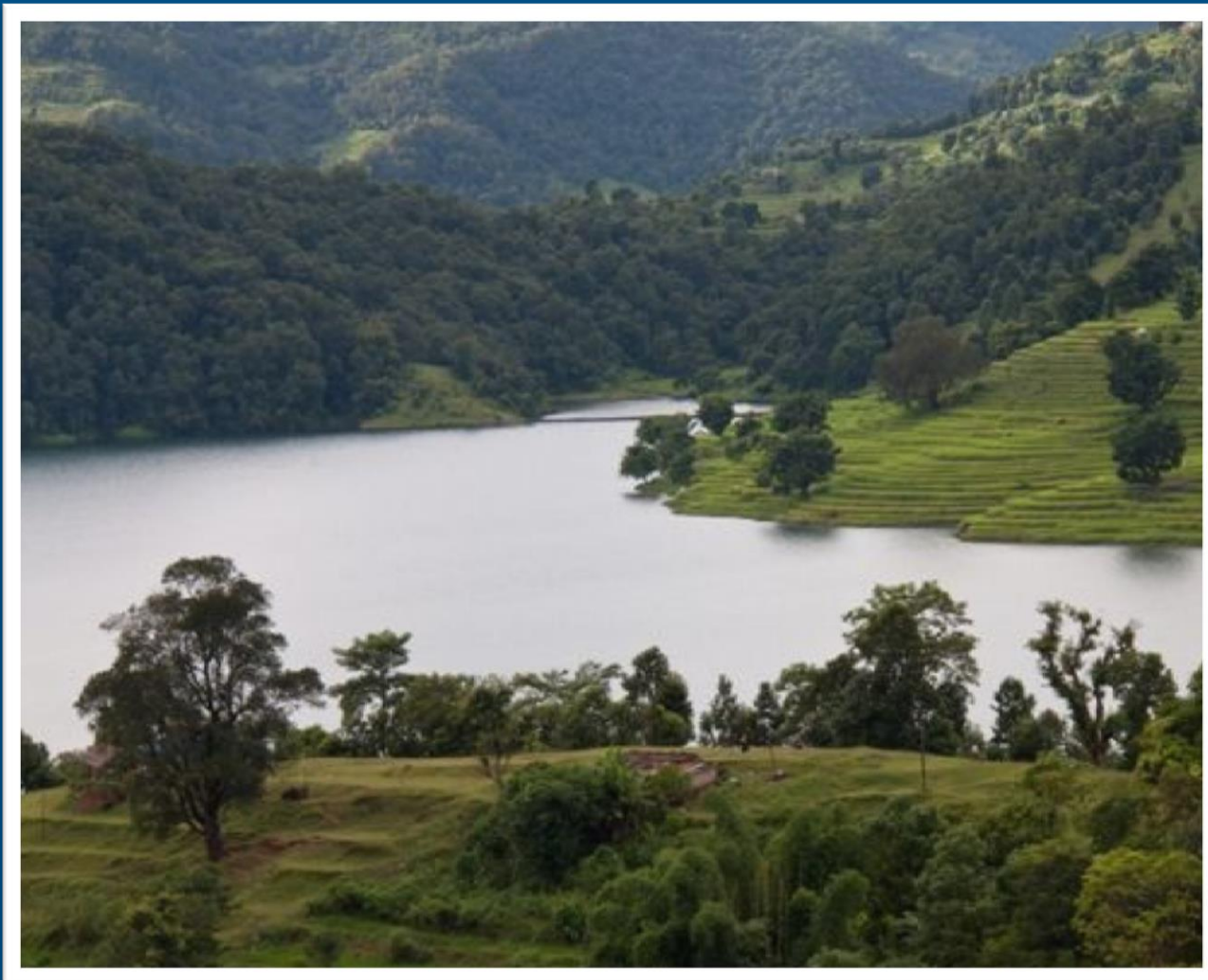
## Wealth Per Capita



## Natural Capital - % of Total



# What about Ecosystems as Natural Capital?



# Lessons from Reviews

- Provisioning versus Regulating Services
- Limited links to trade-offs & human impacts
- Distribution un-even
- Valuation disconnected from policies
- Limited evidence of impacts of PES
- Should payments be equity neutral?



Creating win-wins from trade-offs? Ecosystem services for human well-being: A meta-analysis of ecosystem service trade-offs and synergies in the real world, *Global Environmental Change*, Vol 28, 2014, 263-275



# Case Studies

## Payments to reduce Black Carbon emissions, Krishna Pant



## Payments for Storing Carbon, Bishnu Sharma



# Residue Burning across South Asia

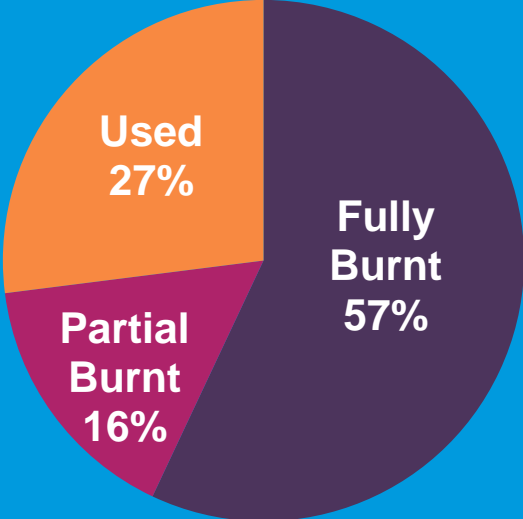


## Black carbon

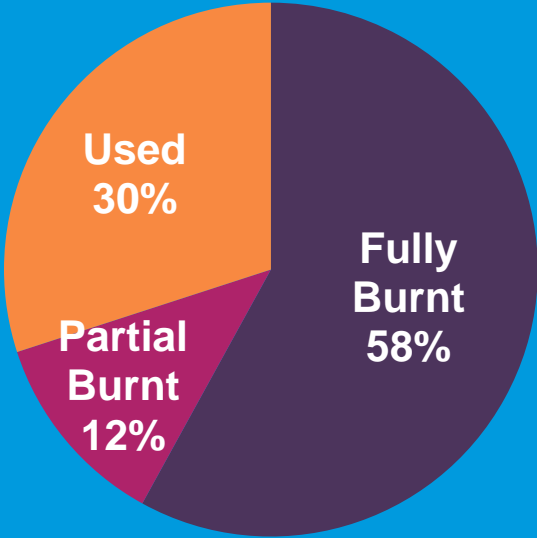
- 2<sup>nd</sup> biggest contributor to global warming
- Health threat
- 40% of global levels from India and China
- 24% from open field burning in India

# Crop Residue Practices across South Asia

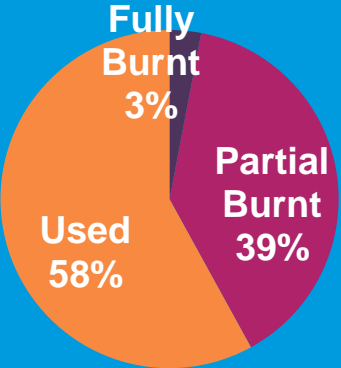
### India - Combine (% land)



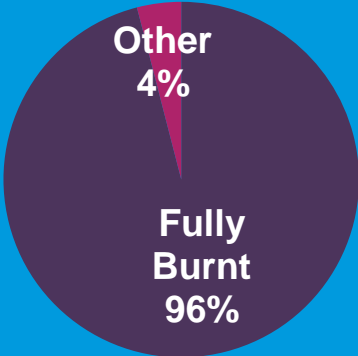
### Pakistan (% land)



### Bangladesh (% plots)



### Nepal (% households)

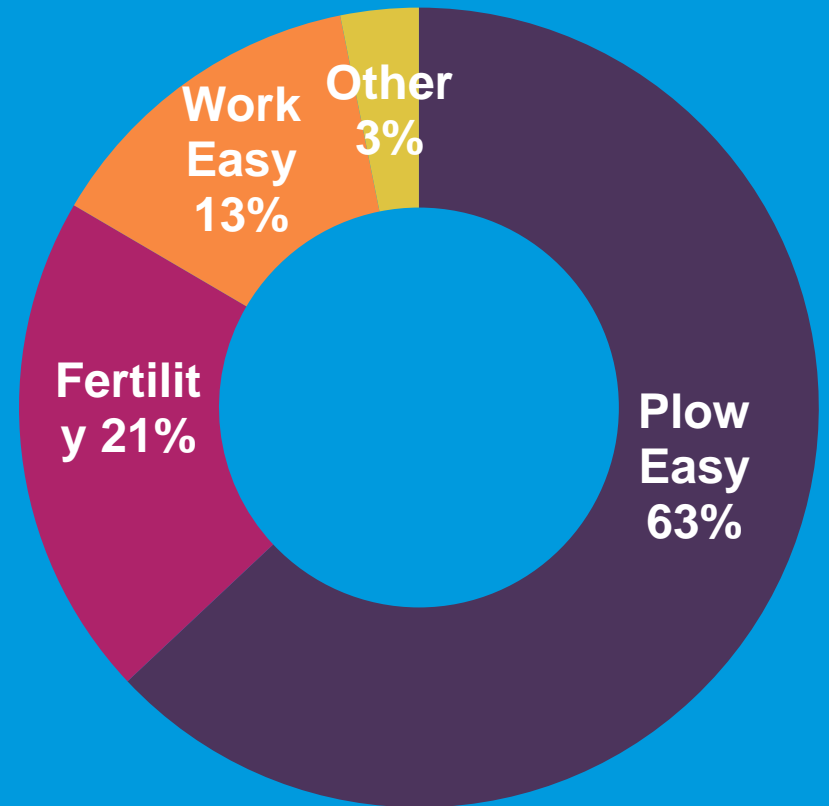
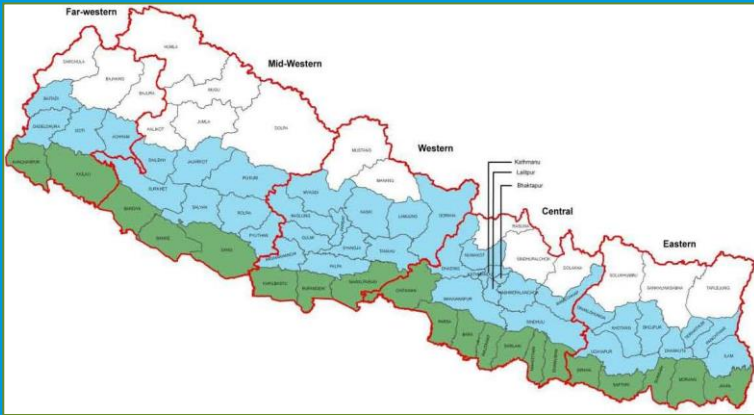


Z. Haider, R. Gupta, Ahmed and Ahmad, K.P. Pant, SANDEE Working papers

# Can we compensate farmers to reduce a public bad?

## 20 mil tons of crop residue

## Reasons for Burn (% HHs)



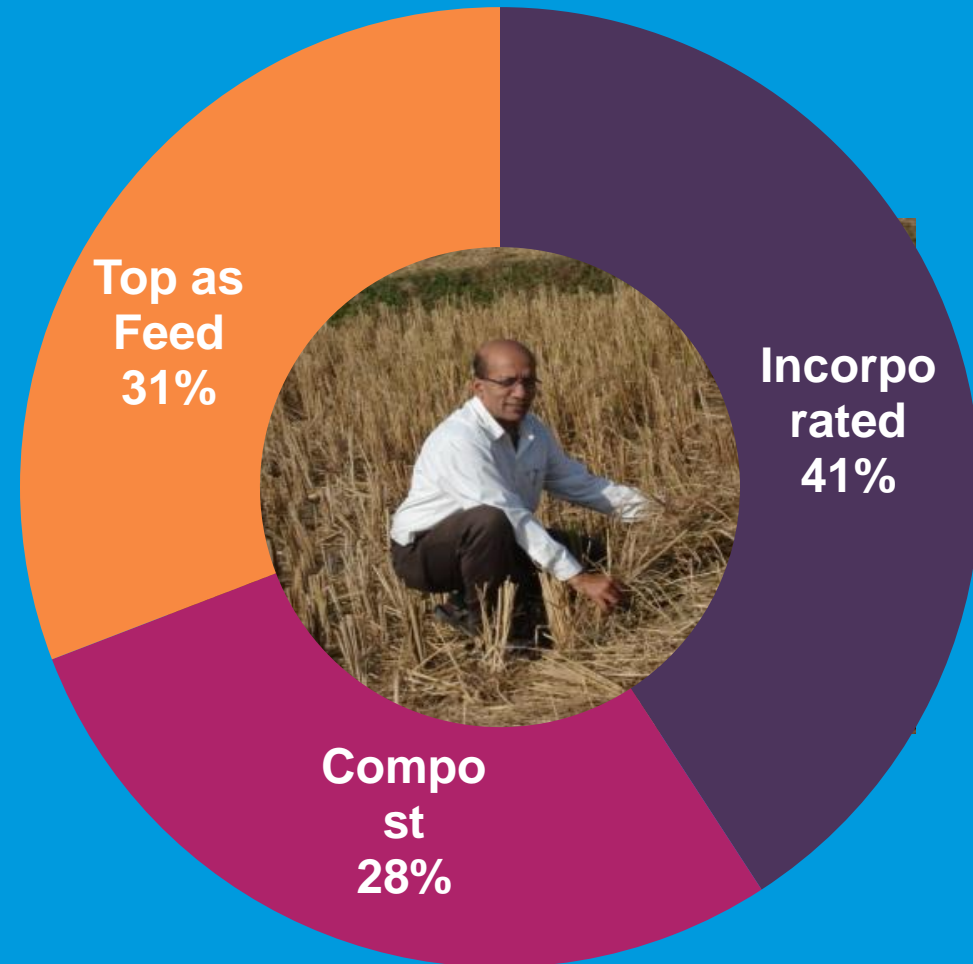
## Combine H. ban in-effective





# Reverse Auction – Accept Payments to Conserve

- Baseline (n=317)
- Bidding
- Agreements (53%)
- Recording Plots
- Monitoring and Verification
- Payments (86%)



Post Agreement (% farmers)

# Lessons to Solutions

## Incentives Work

Median  
payment  
\$78/ha

86 %  
Compliant

## Payments Necessary

Private  
Rights  
and  
Costs

Reduce  
Public  
Bad

## Possible Solutions



# Will Payments with Local Monitoring Work?

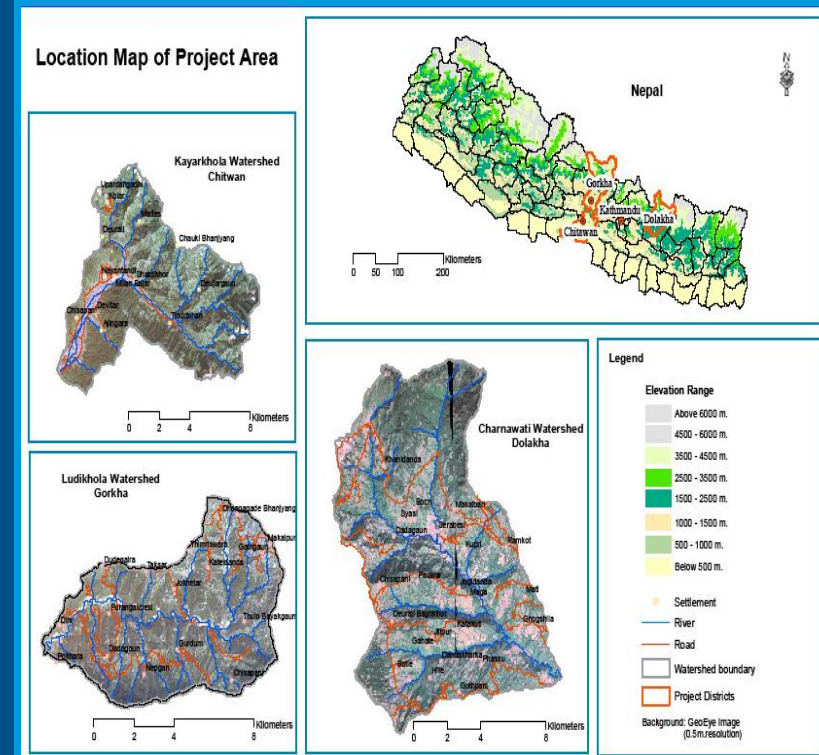
- Deforestation and degradation ~ 17% of GHG emissions
- REDD+ -- market based, quick, cheap
- Will carbon sequestration through community forests be effective, cost efficient, equitable?



Bishnu  
Sharma

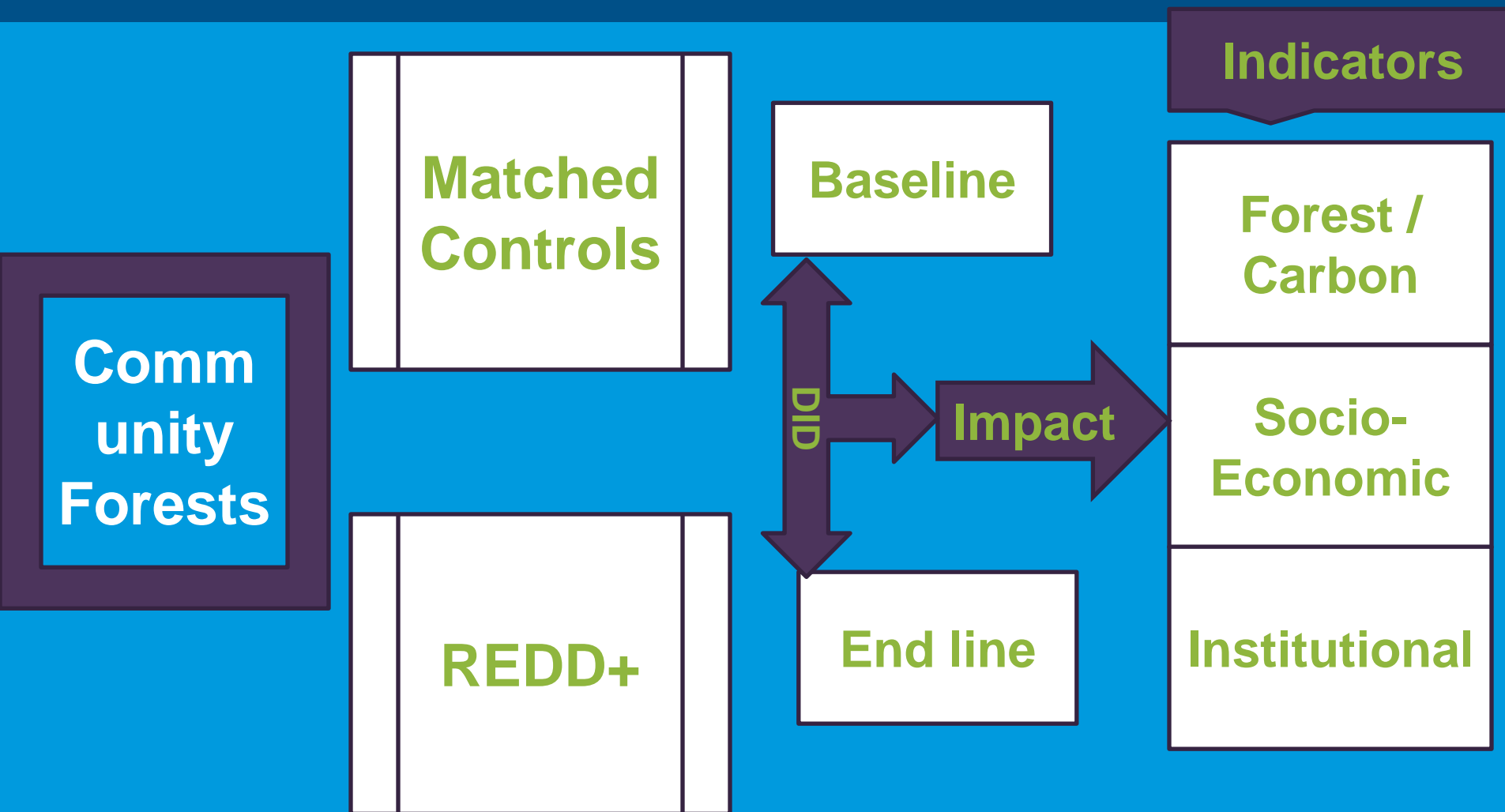
# ICIMOD - FECOFUN - ANSAB Pilot

- National Trust Fund
- Payments = f (Carbon+  $\Delta$  in Carbon + % Indigenous, Dalits, Women, Poor)
- Guidelines on forest and livelihood enhancement
- MRV



Three Landscapes

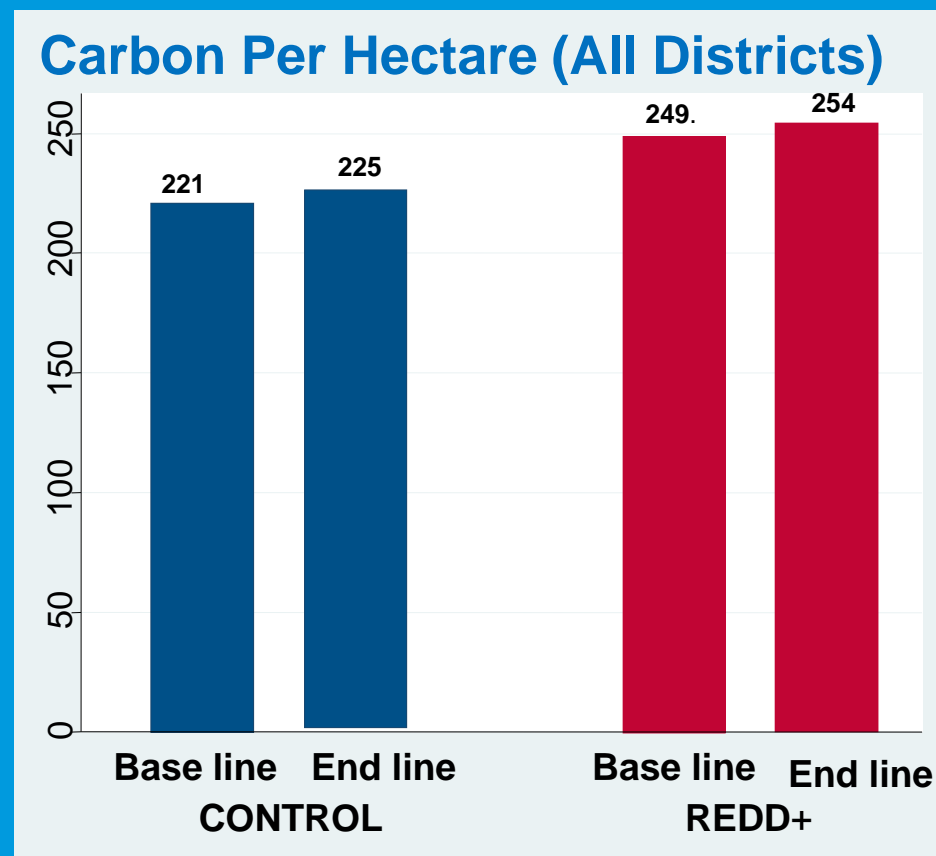
# Strategy to Assess Impacts





# Change in Forest Indicators

Ecological variables	Impacts
Forest fire	(-) <sup>***</sup>
Grass cover (%)	(+) <sup>**</sup>
FW collect signs	(+) <sup>**</sup>
Timber extract	(-) <sup>**</sup>
Encroachments	(-) <sup>***</sup>
Wildlife signs	(+) <sup>***</sup>



# REDD+ -- No Harm to Local Communities

Forest Product Extraction (load)	Impact
Firewood	(~)
Fodder-grass	(~)
Leaf-litter	(~)

**5 -6% increase in Biogas Use**



# Learning from the REDD+ Pilot

Carbon neutral

Trade-offs among services  
can be limited

Shift to alternate fuels  
important

# Observations

- Incentives work
- Connect the  $\Delta$  in dots – services (measures), welfare (value), institutions and policy
- Institutional costs matter
- Integrating ecosystems into national accounts?

# Acknowledgements and References

- Ahmed, T. and Ahmad, B. (2013). Why do farmers burn residue? : Examining farmers' choices in Punjab, Pakistan . South Asian Network for Development and Environmental Economics (SANDEE), Working Paper, 76–13
- Ferraro, P.J. & K. Lawlor & K. L. Mullan & S. K. Pattanayak. Forest Figures: Ecosystem Services, Valuation and Policy Evaluation in Developing Countries, *Review of Environmental Economics and Policy*, 2012.
- Gupta, R.(2012). Causes of emissions from agricultural burning in North-West India: Evaluation of a technology policy response. *SANDEE, Working Paper*, 66-12
- Haider, M. Z. (2013). Determinants of rice residue burning in the field. *Journal of environmental management*, 128, 15-21
- C. Howe, H. Suich, B. Vira, G.M. Mace. Creating win-wins from trade-offs? Ecosystem services for human well-being: A meta-analysis of ecosystem service trade-offs and synergies in the real world, *Global Environmental Change*, 2014.
- A. P. Kinzig, C. Perrings, F. S. Chapin III, S. Polasky, V. K. Smith, D. Tilman, B. L. Turner II . Paying for Ecosystem Services: Promise and Peril, *Science, Policy Forum*, 2012.
- [S. Lele](#), [O. Springate-Baginski](#), [R. Lakerveld](#), [D. Deb](#), [P. Dash](#) Ecosystem Services: Origins, Contributions, Pitfalls, and Alternatives, *Conservation and Society*, 2013
- MOEF, 2012. Economics of Ecosystem Services and Biodiversity: India, Initial Assessment and Scoping Report, *MOEF Report*, GoI
- Pant, K. P. (2014). Uniform-Price Reverse Auction for Estimating the Costs of Reducing Open-Field Burning of Rice Residue in Nepal. *Environmental and Resource Economics*, 1-15.

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# Value, Monetize and Incentivize

- Valuation first step toward conservation
  - Supply, Use, Institutional framework
  - Choice of method
- Ecosystem services
  - Measurement w/o welfare changes of limited use
  - Transactions costs significant in design/implementation
- National Ecosystem Accounts