Assessment of Economic Benefits of PROWESS- Indian Case Studies

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Need for socio-economic assessments of PROWESS? - Indian Context

- The 12th Five Year Plan approach paper

  "a one per cent growth in overall GDP from the agriculture & allied sectors is twice as effective in elimination of poverty as a one per cent growth in overall GDP from non-agricultural sector"

Employment in agriculture and allied sectors 238 million 52% of 461 million workforce

- ***Marine Fisheries Sector:"3288 marine fishing villages and around 8.65 lakh marine fishers' households in India of which around 7.90 lakh house hold (91 per cent) were "Below Poverty Line" (BPL) households."*** Source:The Central Marine Fisheries Research Institute (CMFRI) Kochi. 2010 Census Report
- ***Indian Poor – Some 250 million mostly from rural areas (rural population 830 million urban 380 million (2011)… Bimal Jalan's lecture 2014***
- ***India accounted for 3.7% of world output 2000; estimated to share 8% 2010…. A 1.8 trillion economy per capita GDP USD 3700 etc. but PROWESS aims to help the crucial 250 million population …. PROWESS would help marginal farmers (< 1 ha 62% of operational holdings 75 million optl hldgs) and small farmers (< 2 but >1 ha 19% of operational holdings 23 million optl hldgs)***

- Agriculture & fisheries sector contributes to Indian economy through,
  - employment generation & poverty alleviation
  - development of subsidiary industries dependent on Ag Processing and marketing, fish catch,-fish processing and marketing,
  - contributing to food and nutrition security
  - foreign exchange earner.

Why Assess Economic Benefits? All Countries' Context

- Economic analysis involving use of national parameters enables us to look at implications from the economy perspective unlike the financial analysis which looks at from the perspective of project entity.

- Such an approach is necessary to estimate externalities Fisheries :The framework to arrive at the overall value of the oceans to humans or overall assessment of human impact on the oceans or environmental, economic and social aspects in relation to conservation of marine species and habitats
- Agriculture Per cent of farmers with awareness of use of PROWESS, Per cent benefitting from use of information

Impact of Use of Remote Sensing Technology in fisheries sector - Technology, Society & Government

- Remote sensing has improved livelihood of fishers.
- A field survey in maritime states revealed that the Identification of Potential Fishing Zones increases productivity, significantly improves catch size and reduces fuel consumption, and avoiding extreme weather-related emergency situations.
- The net economic benefits computed due to the scientific identification of PFZs based on satellite information can be estimated

Economic Benefits Computations-PFZ Identification Impact

- Premium on foreign exchange earnings from additional fish catch made possible due to identification of PFZ is the economic benefit.
- The “premium” is arrived at as the weighted average tariff levied on imports (2009-10).
- Thus the “economic benefits” is 10 per cent of additional FE earned due to identification of PFZ.
- The “premium” in economic sense is an estimate of “promotional expense” required to earn one unit of FE.
- Unskilled fishermen in crafts earn a far higher wages due to incentives attached to additional catch from identification of PFZ in contrast to the same craft operating in non PFZ area.
- Economic benefit due to additional consumption benefits of unskilled fishermen in the craft is estimated at one third of the additional wages earned by them (shadow wage rate is two-thirds). Thus one third of additional wages earned by unskilled fishermen is assumed to be economic benefits.

Major Assumptions- Economic Benefits Computations-PFZ Identification

- Scenario 1 assumes that he mechanised craft (national level estimates are available) adopt PFZ information to gain additional catch. Scenario 2 assumes that motorised craft use the PFZ info. Scenario 3 assumes that all mechanised, motorised & traditional crafts adopt PFZ info to realise additional benefits.

- In all our studies, awareness level of fishermen was found to be 94 per cent of the utility of PFZ in realising additional catch throughout India (West Bengal was marginally lower). If motorised crafts and traditional crafts operators also adopt the PFZ info, the benefits to fishermen would be immense.

Value of Oceans-Labour Migration in Marine Fisheries

- Employment status and opportunities in marine fisheries sector has increased over the years

- Manpower employed in active fishing as well as in secondary and tertiary sectors both from coastal villages and other regions were assessed.

Overall Assessment of Human Impact on Oceans

- Several targeted assessments have been made on Impact of unsustainable development practices on:
  - scaling up of coastal aquaculture,
  - sea water desalination technologies
  - marine protected areas and

  loss of livelihoods

Economic Benefits Assessment in use of PROWESS- Agriculture

Farmers

- Unlike fishermen, only 24 per cent of farmers have access and use the weather information.
- All 24 per cent who have access to info are not able to benefits only a position of those accessing info benefit from the information
- Economic benefit from the use of weather information = ((% of farmers receiving weather information * % of farmers profiting from the information * average profit crop wise* proportion attributable to weather information *total production of crop) * conversion factor).

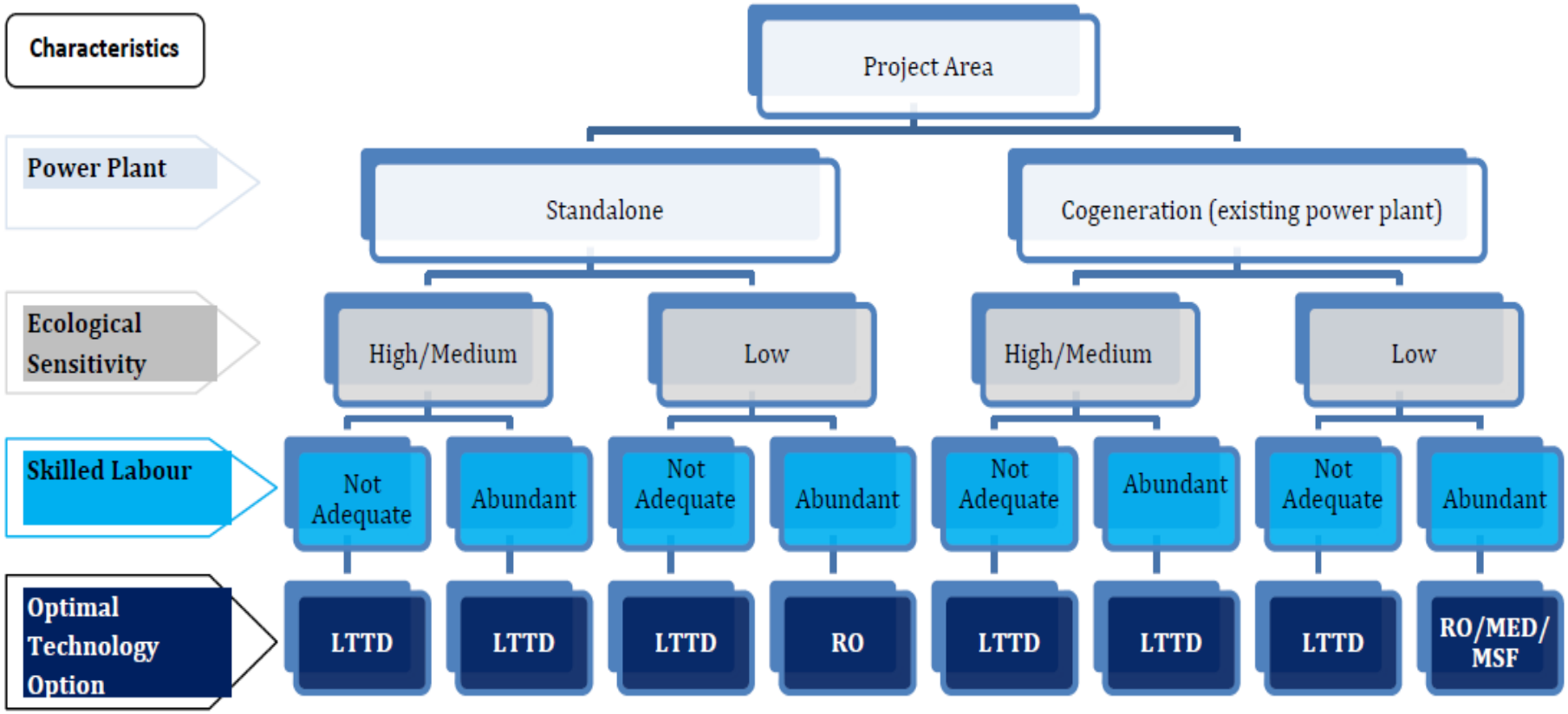
- The conversion factor translates financial values to economic values by using the ratio of international prices to domestic prices for farm output.

How to Measure Externalities- Economic, Environmental and Ecological Framework- Illustrative Example

- **Issue:** The potable water demand/supply gap is being increasingly met by sea water desalination processes in coastal areas. The sub optimal choice can affect traditional fish catch due to 'sea desertification'. The sea desertification occur from the high density, high salt containing brine discharge into the sea.

- **Paper:** A framework to Assess Economic, Environmental and Ecological Costs of Adoption of Sea-water Desalination Technologies in Islands and Coastal Areas
- **Key Point:**
  - The policy planners should not evaluate desalination technologies to rank them universally, but rather evaluate all technology options for each project area in terms of composite cost of economic, environmental and ecological components. Thus the unit of analysis for total cost consideration should not be the "technology" but the "project area".

Result- Optimal technology options across project areas



Thank You!