

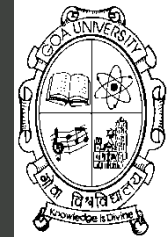
Goa: Developmental Dilemma

Pranab Mukhopadhyay
Goa University

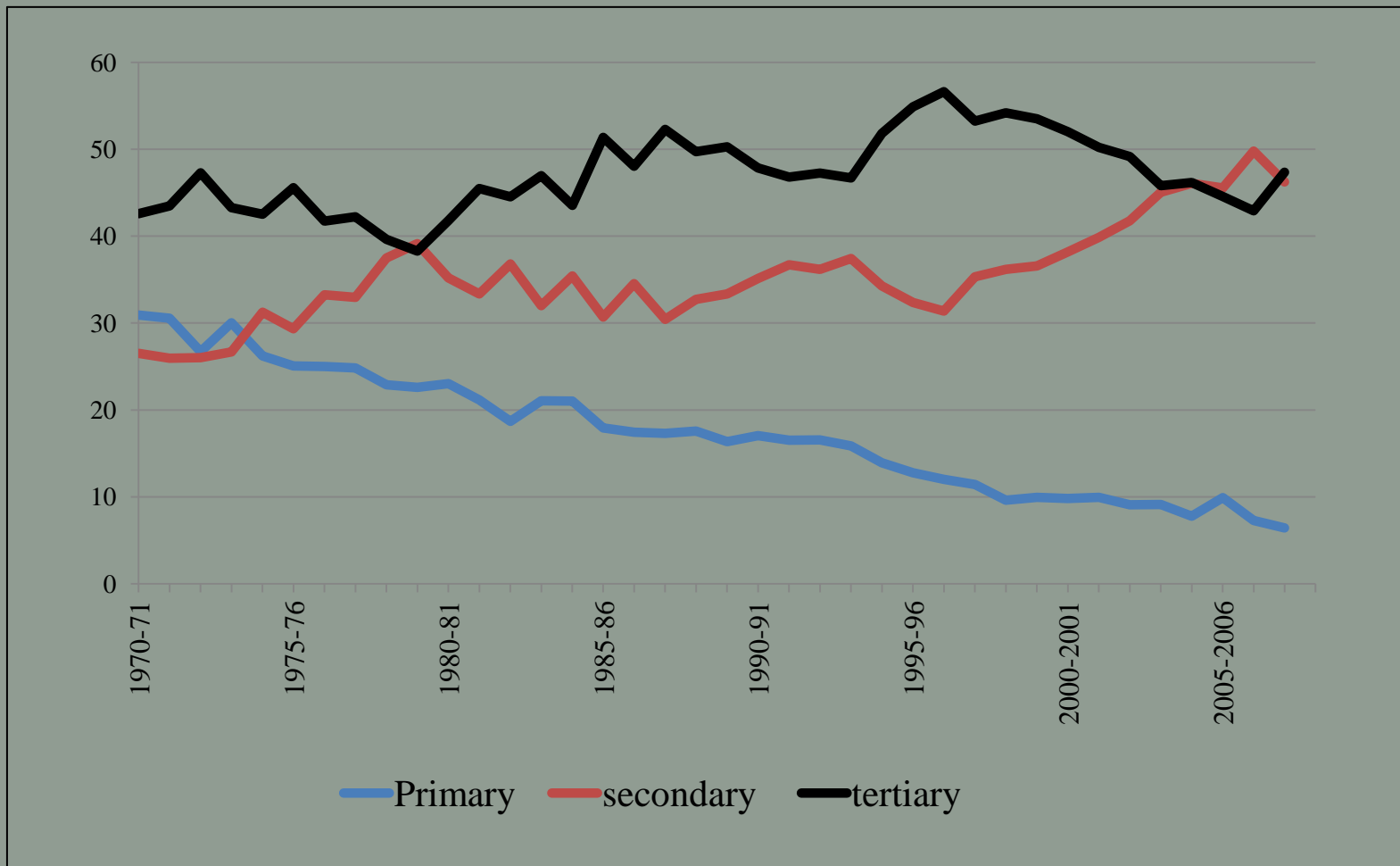
South Asian Network for Development and Environmental Economics

Kathmandu, Nepal

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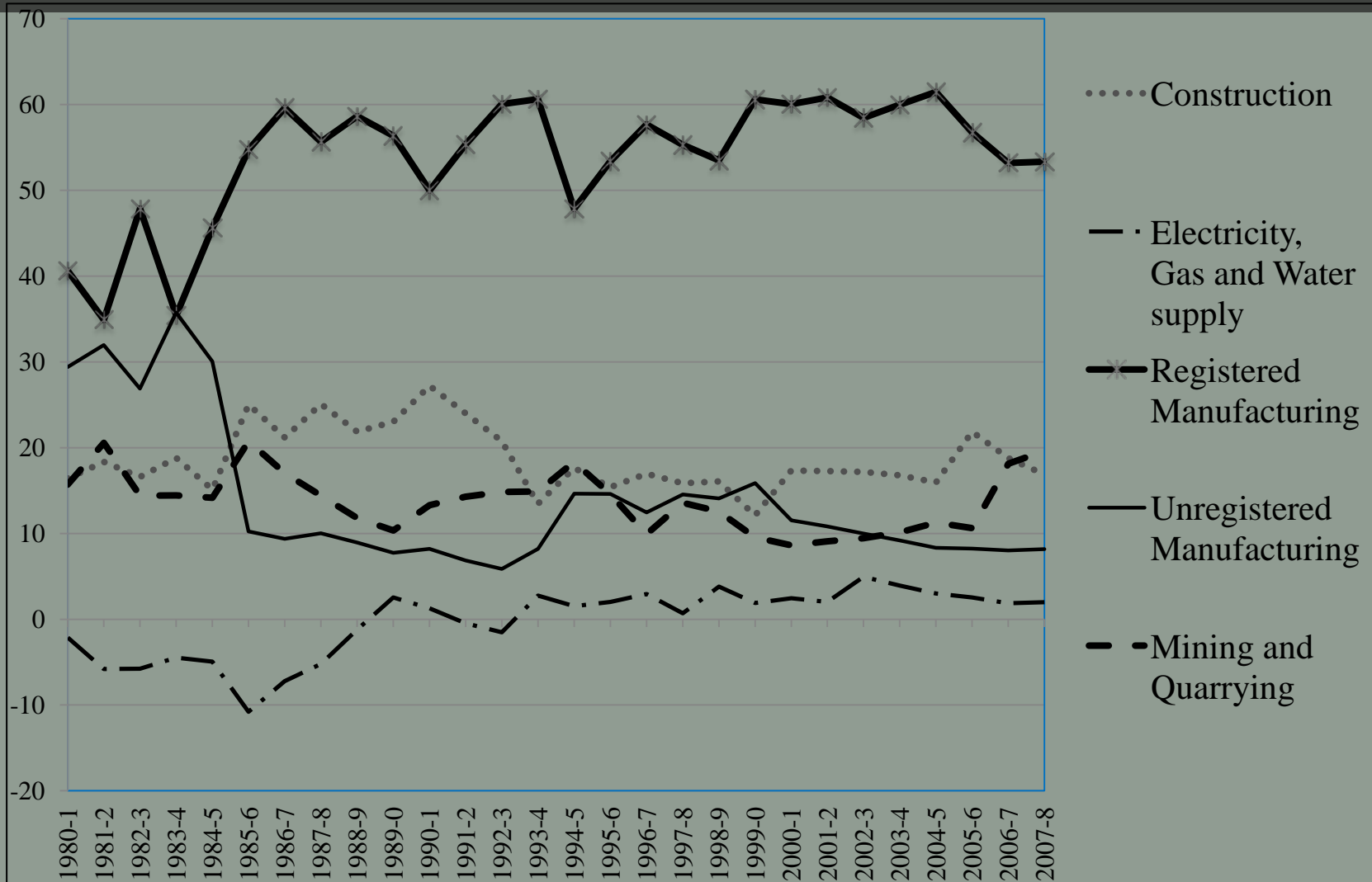


Structure of Goan Economy (NSDP at Current Prices-Sectoral Shares)



Source: CSO, Indiastat.com and Economic Survey Goa (various years)

Structure of Secondary Sector (% share)



Social Cost & Benefit Analysis

- Social costs of mining – loss of ecosystem services
- Social benefits -- Value of minerals (both export and other processing values), employment generation, etc.

CBA of Mining

- Mining outweighs the losses from forest loss. Net gain from mining is Rs 18422 million per year (NCAER 2010) (1 USD = Rs 54 approx.)
- Opportunity cost of disallowing mining is Rs 14,449 crores measured as net present value (NPV) (NCAER, 2010: 50).
- Deforestation cost due to mining is estimated to be worth Rs 4680 million (at 2008-9 prices), which amounts to Rs 0.16 million per ha of forest area.

Mining Area

- The Western Ghats -- a biodiversity hotspot. A UN Natural Heritage site
- Dense tropical forests,
- One National Park and 6 wildlife sanctuaries (FSI, 2009).
- Watershed for the important water bodies such as Kushawati, Kalay, Uguem, Khandepar, Advoi, Bicholim, Zuari, and Mandovi rivers.

Problems

- Mandovi and Zuari and other watersheds are not fed by glacial melt as in the Gangetic system).
- Mining → Denudation of forests → Affects hydrological cycle.
- Could cause increased floods
- Salinity ingress in the rivers loss of marine life, etc.

Comparative TEV (Rs Million) of Goa's forests valued at 2009-10 prices

IRADE (2008:88)		NCAER (2010: 42)		SC (2008)	GAISP Values	
Total Economic Value	Economic Value	Total Economic Value	Economic Value		Higher Bound	Lower Bound
54540	6770	40670	5050	210270	276170	176840

Amounts of Compensation Payable for Goa's forests as per SC mandated values

Type of forests	Amount (Rs) per hectare ^a	Area (sq. kms) ^b	In Rs (crores) ^c
Very Dense Forest	1,043,000	511	53,29.73
Dense Forest	939,000	624	58,593.6
Open Forest	730,000	1016	74,16.8
Total		2151	18,605.89

Source: ^a: SC (2008); ^b: FSI (2009) ; ^c: Values of "a" multiplied by "b"

^[1] The area under forests stated by FSI (2009) differs from the figure of 1424 sq km used by NCAER (2010) in their calculations.

Understanding Royalty

- Royalty is often perceived as a net benefit (gain).
- Royalty = Resource rent for consuming a natural asset (Opportunity cost of depletion)
- The equilibrium price for an exhaustible resource is:
$$\text{Price} = \text{Marginal cost of ore extraction} + \text{Exhaustibility rent (same as royalty)}$$

712 MT of Iron ore reserves
Geological Survey of India
(GSI), as on 1.4.2005 (IBM,
2009: 47_2) of which:

- 268 Mt is proven reserves,
- 190 MT (Probable)
- 254 MT (Possible).

Current stocks

- In 2008-9, Goa produced 33 MT of iron ore-estimated value Rs 38.8 billion (IBM, 2009)
- If 712 MT is extracted at 33 MT/year, the resource would exhaust in 21 years.
- Since $\frac{2}{3}$ of these reserves are “probable” or “possible”, the “proven” reserves will exhaust in 8-9 years.

THANK YOU