

Technological and institutional change: India's development trajectory in an innovation systems framework

Two messages for India's NIS

-Institutions matter

**-Structural change and its nature
matters**

Confucius

“Do not do to others what
you would not choose for
yourself”

Institutions – norms that shape economic variables/processes

- *“... the linkages in industrialization in developing countries depend in fact less on technologically determined input-output relationships than on the characteristics of their economic systems which determine who takes the relevant investment and production decisions, how the incomes generated in the process are distributed, and what patterns of demand grow as a result.” (Raj, 1975, p. 113)*

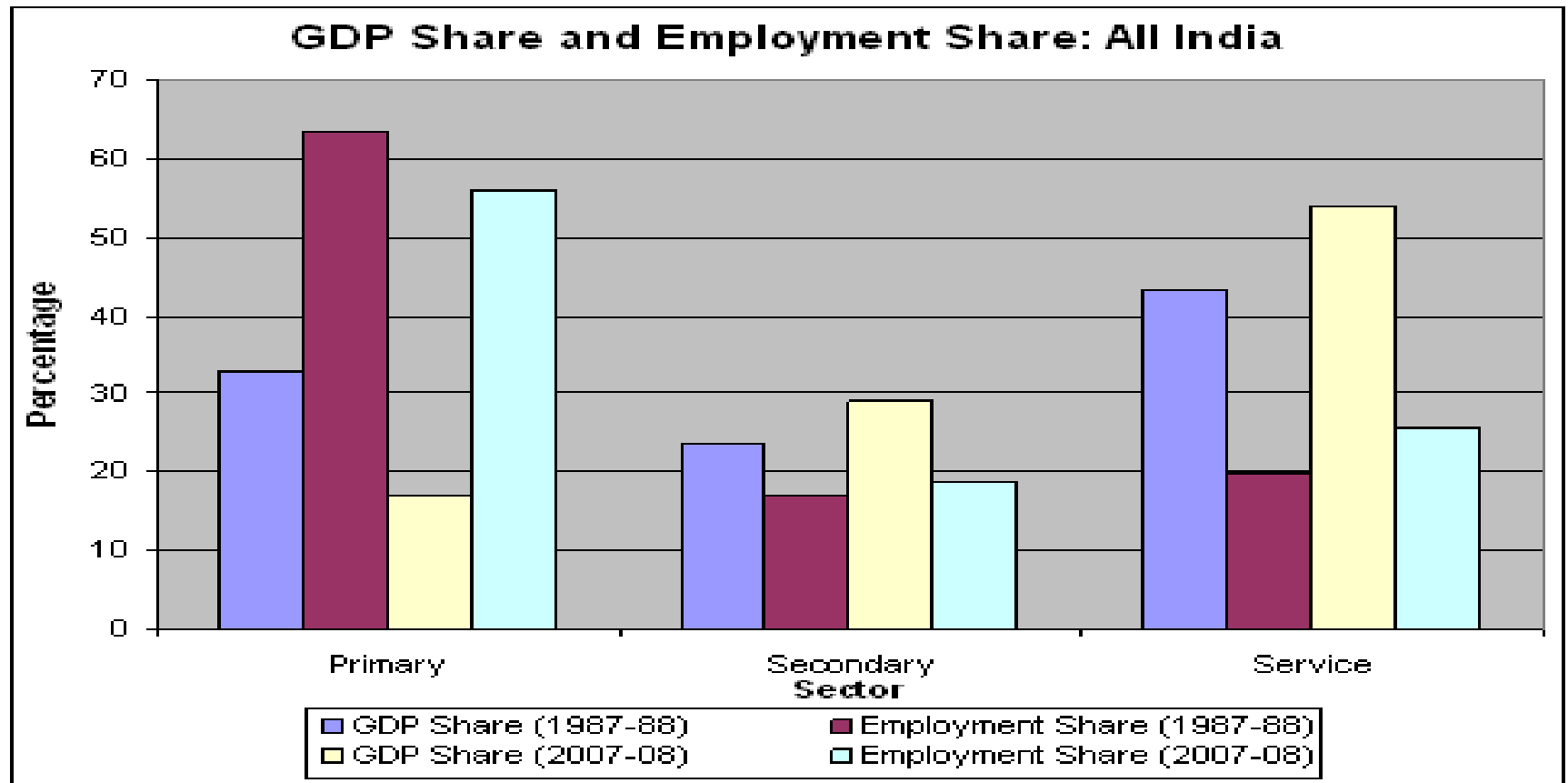
Key Concepts

- Innovation Systems – technological and institutional changes
- Innovation - products, processes, capacities
- Institutions – rules, norms, ways of working, values (Veblen, Kapp, Myrdal, Kaldor,..)
- Institutional change in innovation systems – new or modified rules, norms, values -from interactions, linkages, learning (Nelson, Lundvall, Shulin Gu, ...)

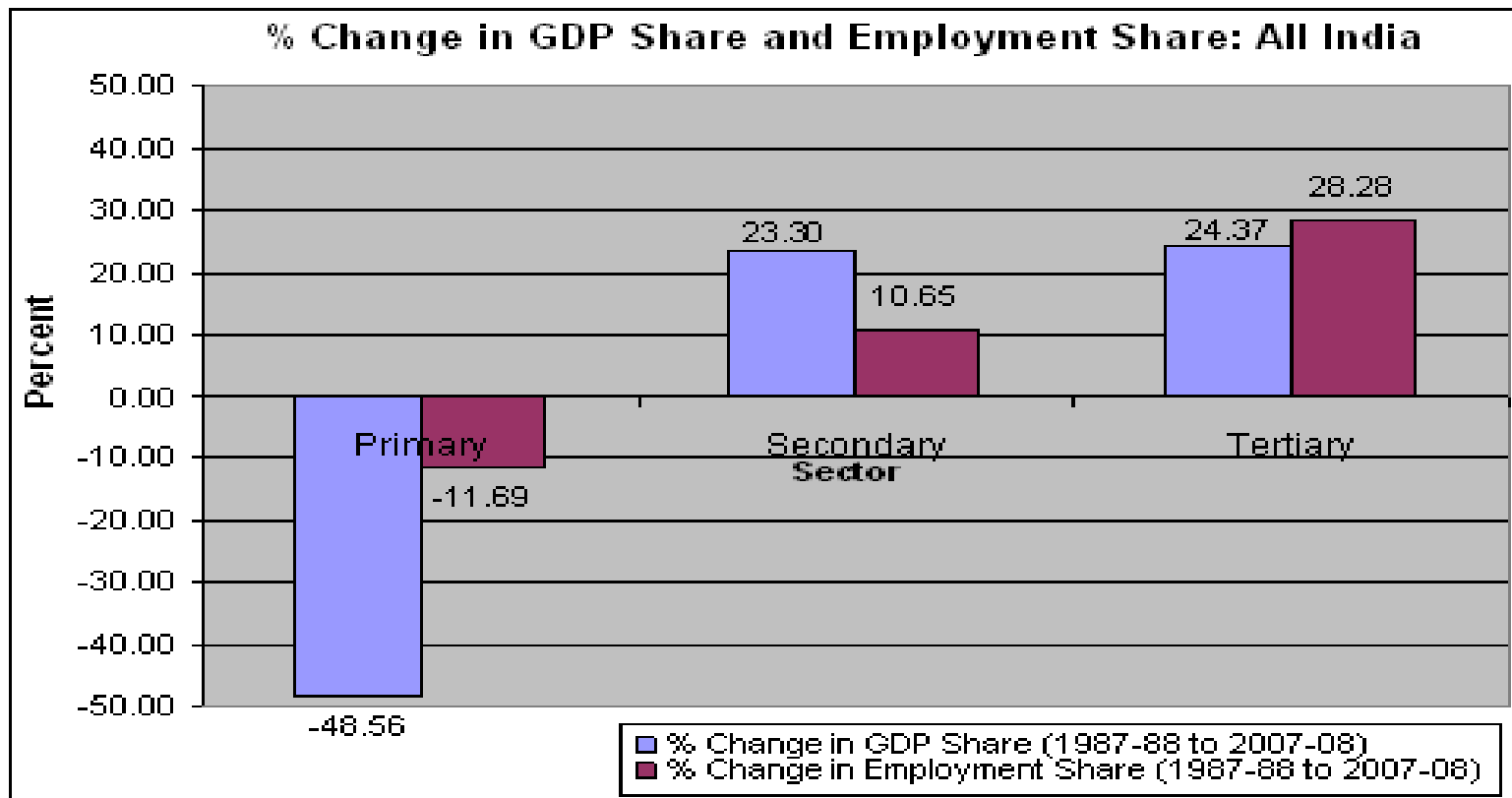
Outline

- India today – economic growth, with poverty, unemployment and rising inequality
- Rural exclusion – a result of the choices made
- Linkages – between industrial and agricultural innovation
 - ignoring the institutional issues in innovation and development
 - investment and innovation – by “developed country” experiences, theories
- The state – needs institutional learning

Sector-wise composition

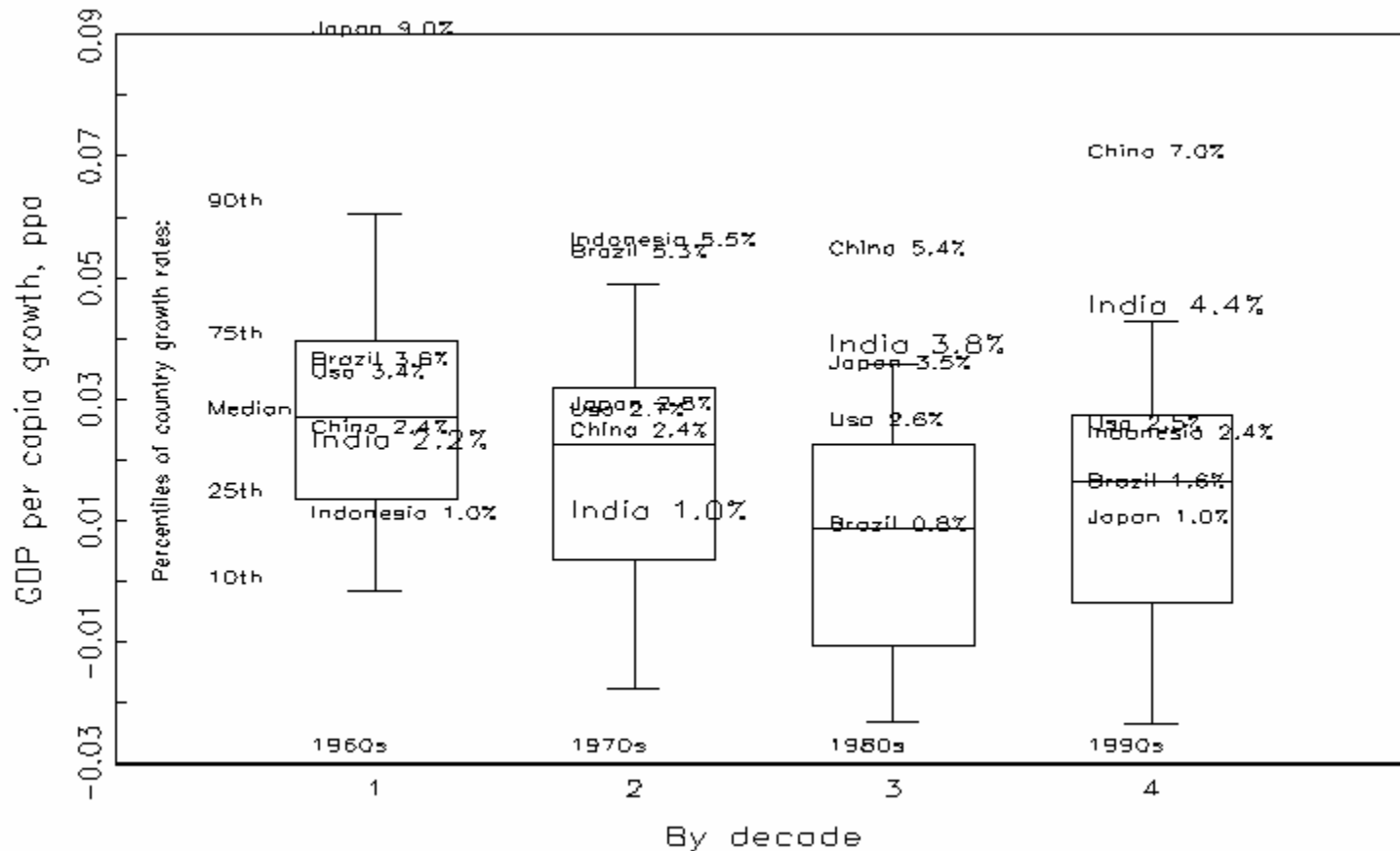


Sector-wise change in GDP and employment



Growth rate of GDP per capita 1960s to 1990s

(Source, World Bank, 2006)



Development paradox

- Economic growth - 8% – high inequality
- Agriculture + rural non-farm livelihoods – poverty
- Industrial growth limited – limited increase in jobs

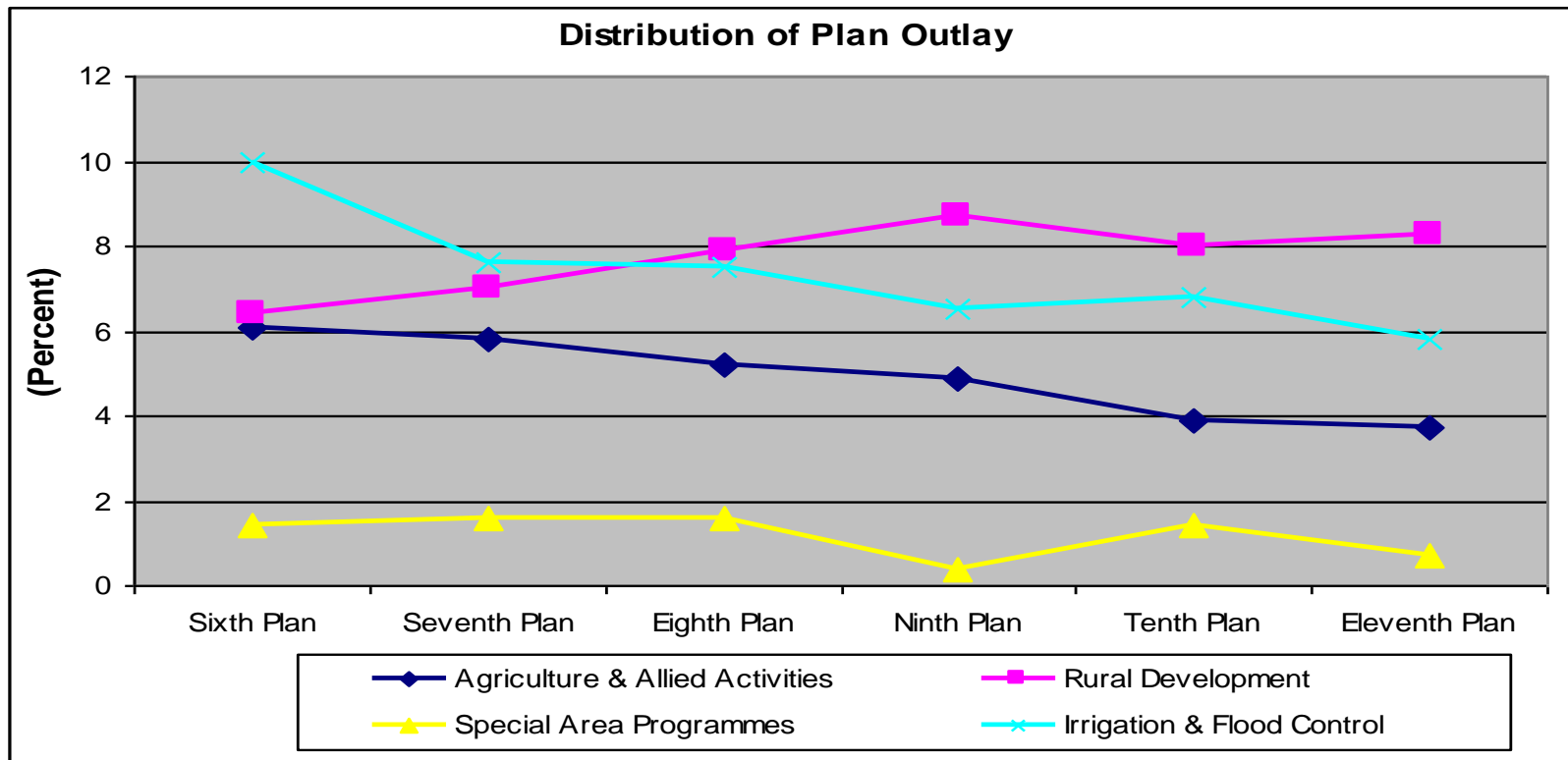
WHY?

Innovation constraints - without institutional reform and structural change.

INDIA IS RURAL

- Rural Population of 830 Million – in 1100 Million
- Cultivators + Main and Marginal workers – 430 Million
- Urban Literacy Rate (81%); Rural (61%)
- Female Literacy 45% in Rural Areas (70% in Urban Areas)
- Malnourished - 49% of Children and 39% of Women in Rural India (36% and 20% in Urban Areas)
- Rural Infant Mortality Rate- 61 (37 in Urban Areas)

Stagnating plan allocations to agriculture and allied sectors



Agricultural innovation

- Institutions or norms for ‘rural mobilization’
 - Nurkse (1951) – idle labour in peasant households – use for capital formation in rural economy
 - Lewis (1954), Fie and Ranis (1964) – resource transfer – surpluses – from agriculture to industry
 - Schultz (1963), Mellor (1976) – rapid growth in agriculture through technological change- leading economic role of modern agriculture
- Capital formation in and for agriculture
- Neglect of rainfed farming, areas, people – 60 percent of India’s arable land

India's drylands

- Evidence of exclusion -
 - Account for 60 percent of NSA
 - Over 70 percent of operational holdings
 - Over 50 percent of foodgrain production, 60 percent of livestock population
 - Over 50 percent of the population and 90 percent of farmer's suicides
 - Less than 20 percent of irrigation investments
 - Less than 6-8 percent of national agri. subsidies
 - Less than 12-20 percent of agri.research resources
- Institutions and policy frameworks for investment and administration are different from irrigated areas

Industrial innovation

- Investment norms – expected linkages –
Leontief's cook book – technology choice –
industrial investment choice - 'since there was
thought to be hardly any choices here,
institutional factors could make little difference to
industrial structures' (Raj, 1975, p. 109)
- Capital goods industry- declining share of
manufacturing, labour absorbing industry, limited
innovation.

Innovation? ?

- Agricultural growth – limited by unwise investments – institutional constraints to innovation
- Industrial growth – limited by poor aggregate demand (over 60 percent of the population) – limited innovation – institutional constraints to investment and employment
 - a vicious circle – - continues--

Institutions in innovation systems – belittled, ignored

- Among innovation systems components -
Demand component – weakest
Enterprise, Research, Policy, Intermediary
components – seriously flawed
- Increasing S&T funding cannot help –
unless structural changes and appropriate
investments are made

Social sciences – institutions and innovation

- “Economics” and techno-centric legitimizations -2nd school of institutional economics
- Limited social science engagement – institutions ignored
- No space for learning - Institutional changes emerge from – (i) need to escape repeated patterns (ii) desire to learn, to experiment – Veblen’s workmanship
- Lessons ignored –from emerging economies- local govt., energy, labour, gender, environment-friendly production, etc.

Innovation capacities within the State

- Assumption - that economics , the social sciences and the state understand can enable institutional reform- need a “structural reality check”
- Dominant institutions –agenda setting norms from developed countries – innovation for development - sequential or synchronized?
Learning – design pilots with safety nets