

**Towards a Sustainable System of
Innovation:
The Case of Plantation Sector in Kerala**

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As we proceed

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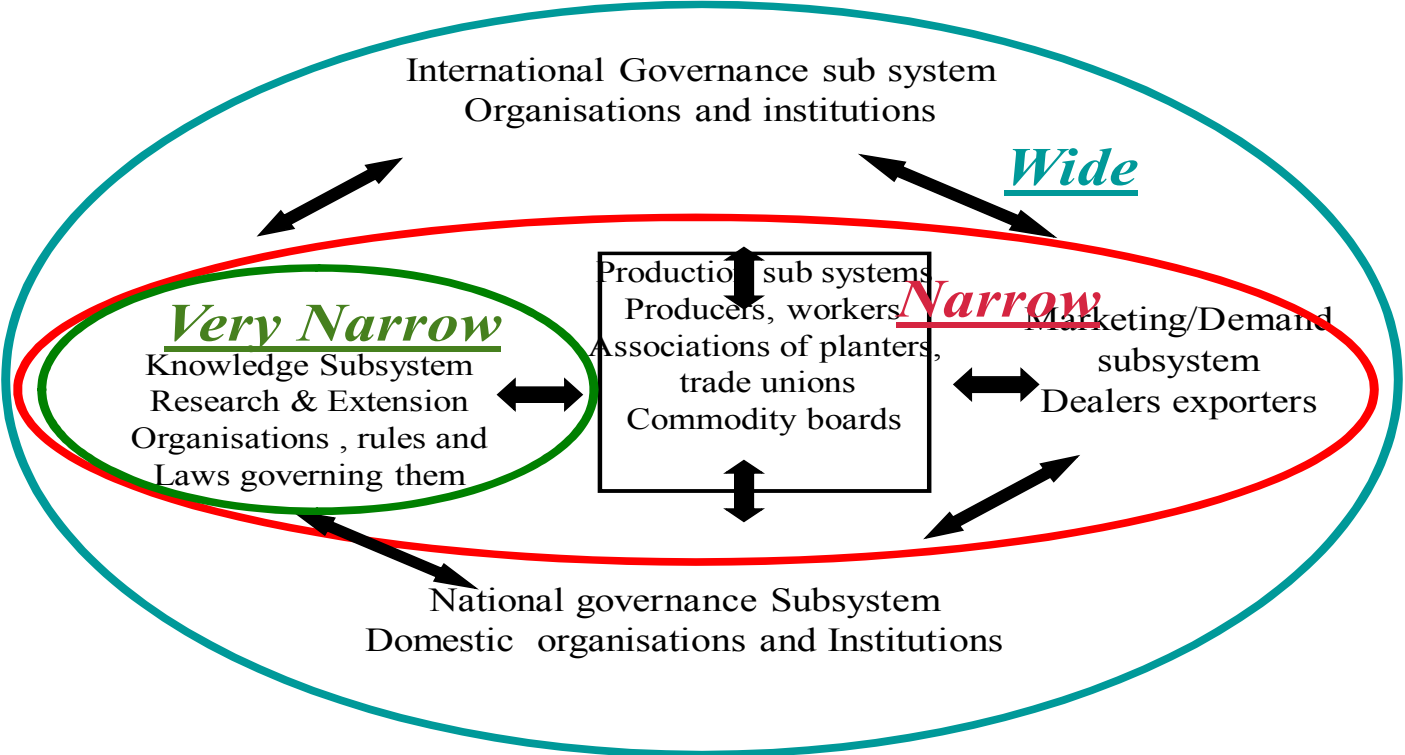
Towards an analytical framework

- Road to high growth is no more an uncharted terrain
- Innovation has been key to higher growth
- Higher growth however has not been sustainable
- While a recipe for higher growth is ready, policy makers are in search of ways to make it sustainable
- If innovation breeds growth, could it also be instrumental for sustainable growth?
- A dollar worth of potato chip different from a dollar worth of microchip
- Hence to understand the micro foundations for growth and sustainability the inquiry has to be at the sectoral level which justifies our focus plantation sector

Towards an analytical framework

- Viewed in a dynamic sense; high growth trajectory could be associated either with complimentary or non complimentary relationship between environmental and economic sustainability
- This in turn would depend on the growth drivers in the economy.
- Since innovation and growth are driven by the underlying innovation system; if growth needs to be sustainable the underlying innovation system also has to be one that is oriented towards sustainability.

Innovation system in plantation sector



Emerging innovation system in plantations

- **Plantation sector has been a key source of foreign exchange**
- **Towards building international competitiveness, a vibrant system of innovation and production has been evolved over time**
- **The key issue is whether the nexus between economy, ecology and technology in Kerala's plantation innovation system as evolved over the years has been tending towards a trajectory of high growth with complimentary or non complimentary relation between economic and environmental sustainability**

Organizational innovations: shift from estates to small holdings

- Historically, plantations have been organized as large estate with mono crop
- Over time small holders have emerged as dominant players
- Given the economics of small holder production mono cropping is inimical to small holders
- But, the institutional arrangements are not conducive for mixed crop cultivation which is more environmentally friendly as compared to mono cropping



Technological innovations

- Highly chemical fertilizer and pesticide intensive production (eg cardamom)
- Deforestation resulting from shade regulation in cardamom cultivation
- Felling of trees for feeding cardamom curing houses
- Lack of co-evolution in the form of organizational and institutional innovations to address these issues leading the non complimentarity between economic and ecological sustainability

Institutional innovations (global)

- Agreement on Sanitary and Phytosanitary Measures at the instance of WTO
- Though these are non tariff barriers,
- Positive response from organizations like Spices Board - organic farming - research agenda towards evolving reduced inputs of chemical fertilizers and pesticides

Institutional innovation (global)

- Kyoto protocol – Reducing Green House Emission
- International Emission Trading (IET), Joint Implementation of emission reduction projects (JI) and Clean Development Mechanism (CDM).
- CDM - funding from developed countries for environment-friendly projects in the developing countries - that help developed countries earn Certified Emission Reduction (CER) credits or carbon credits
- Potential for plantations

Concluding observations

- Given the importance of plantation sector as a foreign exchange earner a vibrant innovation system has been evolved overtime
- Competitiveness at the forefront – environment at the back seat
- There is a two two way relation between ecological and economic sustainability in plantations.
- Overtime, there has been growing concern with its impact on on sustainability

Concluding observations

- Over the years certain organizations innovations – estate to small holders, mono to mixed cropping) are salutary to sustainability
- But there appears to be an institutional inertia such that institutional innovations (rules laws etc) are not coevolving with organizations innovations
- Certain technological innovations (in production and processing) appears to have the effect of making the the sector environmentally less sustainable). Here again we find institutional inertia
- But institutional innovations at the global level appears to be more oriented towards making the sector more sustainable

Concluding observations

- The study makes the case for evolving sustainability oriented innovation system wherein various innovations coevolves in such a way that the plantation sector is made sustainable

Thank you