

# Policy Perspectives on Innovation and Sustainable Development



## Policy Perspectives on Innovation and Sustainable Development, By

Sujit Bhattacharya, Yogesh Suman and Tabassum Jamaal; Volume IV in India S & T Series, NISTADS Tracks in Policy Research NTPR- 1, CSIR NISTADS, New Delhi, 2017, ISBN: 9781642047400.

The book identifies the need for evidence-based policy making, but works more on addressing conceptualisation and operationalisation aspects alone to a greater extent and to a lesser extent normatively. To say that a one size fits all approach is criticised, conflicts with the ability to generate concrete understanding in some parts. The Book, however succeeds in crafting the contours of the Decentralised Model of Science

and Innovation to the aim of establishing sustainability of development.

The Book works well, in part by identifying the concepts of sustainable development but risks conflation of development of sustainability with sustainability of development at places. This though gives some of the themes discussed policy value at some level yet doesn't go far to address the linkage outlined i.e. the linkages of sustainable development and Innovation. Suffice to say, the Book appears to be caught in the themes that defy complementarity, in terms of the linkage under exploration. This may for the target reader they have outlined, lead to unintentional blurring of theoretical boundaries, as

### Copyright

© The Author(s). 2018 This article is distributed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made.

well as skewed internalisation of the syntax involved. Also, the book emphasises that measurement does not follow a straight-jacket formulaic approach in such cases and that it is the conceptualisation that becomes more relevant and meaningful in cases, particularly in studying dynamic aspects of innovation systems. These two aspects work in ways, both positive and negative for the reader.

At the theoretical level, we have the Regional Innovation system incorporating the evolutionary trends, which is at display in the Chapter on the case study of the Indian Dairy Industry (Chapter 2), and on the entrepreneurial ecosystem in Bangalore, which follows a rationalist and formalist characterisation (Chapter 3). This formalist characterisation of firms is quite at cross purposes with the overall discussion of informal sectors in Part I of the Book. The Chapter serves to underscore that the reality in the informal sector case studies is also to a large measure reflected in the organised Information Technology Clusters of Bangalore, at least in terms of the level of evolution achieved. This helps discredit the view that firms are organised, efficient actors within the network, as far as technology is concerned. That creates a need for an alternative epistemology of political economy and that of an Industrial organisation to meet the new political economy, which is often viewed as an unrealistic pursuit. Chapter 3 could have also engaged with aspects of size and age of firms deeply, given the preponderance of start-ups cited in the Information Technology Industry. There is no explanation as to why firms like start-ups exist and prosper, particularly in this sector and how they fade away. Absent this, it renders the narrative monolithic, while for the discerning reader, the firm level differences are equally important. This sector being service-intensive could have served to emphasise structural issues in services versus goods sector. As much is known of the manufacturing sector, this Paper serves the purpose of throwing light on the services sector, which essentially covers knowledge related services. Actually, thought-provoking insights could arise on whether the innovative problem is an entrepreneurship problem, at what level and how start-ups can be promoted. It appears somewhat of a misfit in the scheme of the Part I, save for studying regional systems of innovation that it appears and is suitable for juxtaposition only.

Another key theme outlined in the Informal sector in various chapters of Part I is the absence of scale economies, lack of product innovation and the nature of competitive advantage enjoyed being limited to cost advantages. In fact, the first few Chapters underscore how the articulation of competitive advantage is problematic to the Indian innovative context, on a regional basis at the actor, collaborative and systemic levels. This touches more fundamental structural issues and is hence more processual than statistical.

The Book begins with a Paper on Innovation strategies in the Textile Sector studying the Surat Cluster (Tabassum Jamaal *et al.*). The characterisation of competitive advantage from a Porterian perspective leads to a recognition of the multilateral trading system, being at odds with the view of Innovation at the margins. It is here that the Chapter though very well documented does not fully engage with the issues faced by the Textile Industry, as even in new clusters, innovation is demonstrated to be a bleak prospect. However, in terms of the mature clusters, where typically price competition is visible (based on expectations in economic theory), the scenario is even grimmer.

The fact of subsidy support through loan waivers is relatively under-documented here but appears as a structural factor behind the survival of economic agents in the sector. This Chapter points to another irony of oligopolistic business organisation on the one hand and the existence of sectors with huge populations of actors, remaining underutilised. The contradictions of labour intensive and technology-led growth (that is often characterised as a function of altering requirements of labour and capital) becomes apparent, as another structural facet of technology-led economic activity in India. The Chapter does well to identify the path dependence on pathways that do not consider Innovation as very instrumental. This irony reflects the reality well but taking the sustainability of the process of innovation appears as a non-starter of sorts.

Another key aspect is the preponderance of process innovation which is part of conventional wisdom in relation to many sectors in India. However, the determination of organisational innovation as a relatively low priority to firms undermines the need for Industrial organisation. This is another achievement of the Book to discern in which way firms in the textile sector and for that matter industries in low technology sectors operate.

Chapter 2 studies the case of the Kaira Cooperative Society cluster in Anand, Gujarat (popularly 'Anand'). This Chapter is symptomatic how the focus of the regional system of innovation on success stories does not engage with the challenges of extension of successful models to other sites. The characterisation of the Industry, in terms of the changing product profile, has been well-documented. However, the engagement with the issue of why domestic machine equipment manufacturers are not incentivised to generate state of the art machinery for the Indian Market is not discussed adequately. The Chapter demonstrates the importance of generating social capital among milk producers in the Informal sector, as being largely outside the success achieved. Further, in terms of the Institutional aspects, the issues of compliance with adulteration underscores the need for decentralised standard-setting processes. Also, the role of consumer preferences in orienting

product innovation is another insight that merits attention to enable user innovation. However, in terms of the sustainability theme, the innovation in packaging technology could have been better studied to see not only attitudes, but forms relevance in terms of its environmental impact. The case for foreign investment in the sector is rather tenuous and demonstrates how conventionally technology transfer has not accompanied the movement of factors of production, especially capital. The issue of cold chain development could have been given more scope in terms of discussion to enable how infrastructural challenges relate to sectors involving natural resources, especially agricultural produce.

Chapter 4 attempts to document the contribution of the horticultural sector in Jammu and Kashmir towards regional development, especially socio-economic impact. It outlines the formal and informal actors, their linkages- forward and backward. However, the promising prospect of deriving interactions of forms, values and social relations that evolve around technologies, shared knowledge or skills and producer-supplier relationships has not been fully attempted here. This reflects how the absence of institutions, particularly informal ones is also an impediment to shared knowledge and values leading to institutional vacuum. This, however, juxtaposes with the conventional wisdom that visualises institutions, particularly formal ones as divorced from the informal context. The resultant formal institutions are not informed by a bottom-up approach, which is neither socially efficient nor is it in line with their context-dependent nature.

In terms of the characterisation of regional innovation systems following Asheim (1998), the author of this Paper has not been able to decipher or discern either a territorially embedded regional innovation network or regional networked innovation systems. The Paper serves to characterise an architectural view, which is perhaps a constraint social reality in such sectors imposes. One would have wished for a more engaging analysis that moved beyond this characterisation.

Interaction of the informal and formal institutions, particularly learning and knowledge transfer have emerged as an interesting area of research which the case study perhaps does not acknowledge. This is on account of the conflation between formal agencies and formal institutions, the latter which does not enable values, shared knowledge much less normative dimensions (page 43). Thus, the Paper fails to enable the formation of regional innovation systems as playing a strategic role in the development of the capacity of regions to innovate and to create competitive advantage. This Chapter works to show how economic activity at the periphery does not fit itself into the formulaic visions of the structured firm philosophy and does not follow trajectories, which are pre-determined but deterministic of technology assimilation. This also serves well- to define the integration of apple growers

with value-adding activities in the research and development, yet doesn't outline their downstream impact, which is readily discernible.

Chapter 5 documents the performance of the Bamboo Industry in the North-Eastern region by use of a survey. This aimed to develop a product profile of firms engaging in bamboo trade, ownership characteristics, skill levels of workers, customer profile and Innovation activities. Some findings on Turnover, Manpower and Input cost material serve to underscore labour-intensive nature of the Industry. The findings on sources of funding demonstrate that most Indian businesses do not employ huge capital resources due to access issues. But how it answers the objectives is unclear. The customer profile reveals the preponderance of private manufacturers and the nature of innovative activities centres around new product innovation followed by process improvement, when compared to an efficient use of raw material. This part is well-taken. It characterises the Bamboo Industry well, but it could have engaged with the findings more deeply.

Chapter 6 on Green Technology and Sustainability studying the case of Indian Automobiles does well to conceptualise the sustainability paradigm in the user's domain through the case of electric vehicles. Here particularly the Literature review could have been oriented towards the Responsible Innovation perspective. The Technology, Awareness, Lack of Policy Implications and Infrastructure are findings that should have been grounded from empirical data. The R and D problem could have been better conceptualised.

The Chapter on Leather technology (Chapter 7) tries to grapple with the dynamic of sustainability because of the obvious concerns surrounding the Industry and the efficiency of its process, in terms of the environment. It provides a narrative of unsustainability that the Courts have recognised historically and that the fate of the clusters in the Northern regions corroborate. In respect of leather technology, it is known that the zero-emission approach has been successfully implemented. This Paper still holds to the old school argument of unsustainability. No explanations as to why the paradigm shift to zero emissions has not resulted misses the opportunity to make a contribution to the solution.

Chapter 8 on "Waste Water Treatment: From Problem to Resource" documents the Wastewater treatment problem in metro and other cities well. The Technology upgradation should come on the back of policy operationalising the mandates of running Effluent Treatment Plants as community initiatives, which answers to an organisational innovation. This argument is well-placed within the Sustainable Development-Innovation Linkage. It does not shed light on how this needs to be done-in formal structures or through informal structures, which is bit of a drawback.

Chapter 9 attempts to develop the case for offshore wind energy towards achieving energy security within the renewable energy policy of the Indian Government. This however follows the theoretical framework of regional innovation systems to a reasonable extent and engages with the problem of sustainability.

The Chapter on Informal sector (Chapter 10), intrinsic motivations sets up a counter-narrative of incentive systems other than Property rights and extrinsic motivations to innovate. The policy suggestions seem well grounded in the informal sector and should serve as a suitable starting point for enculturating innovation. However, there can be contestations on the feasibility of promoting intrinsic motivations at all times. I mean structural issues like access to micro-credit, infrastructure, support services cannot be replaced but if we were to go towards commercialisation, then intrinsic motivations would shift and change forms and not follow easy trajectories and/or normative prescriptions.

The absence of a clear synthetic mandate comes across, particularly in the Chapters on Protecting Traditional Artefact for Socio-Economic Sustenance: Case Study of Gamosa, A Traditional Handicraft of Assam (Chapter 11), Traditional Medicinal Knowledge: Study of Tribal Practices in Wayanad District (Chapter 12), though beautifully documenting the aspects they choose to study do not go so far as critically engaging with admitted contradictions of the Property rights system. This is both at the level of argument of a reputation for textile goods and at the level of social practices, surrounding the community engaged in the transfer of Traditional Medicinal Knowledge in the latter. I feel that the arguments in these undermine the sustainability of practices argument. This is despite the contradictions of the sui generis system as an institutional innovation seen vis-a-vis the property rights system. This view is in light of the increasing clamour for Geographical indications in cases, where the content of the right based on reputation requires further rigour, as various similar cases demonstrate. Further, the case ignores the structural problem of high labour input in the textile sector, which is at once counter-intuitive to the narrative of reputation. This in my view may not help address other structural issues that are important in any significant manner. The focus of reputation to get customers is not welfare enhancing nor is it instrumental to the cause of survival of the Industry.

Chapter 13 on regional collaboration in the Ayurvedic Medicine Industry within Haridwar and Lucknow clusters attempts to identify collaborative activity in the context of historical and cultural contingencies. It is a good attempt to study the behaviour of firms relying on resource based economic growth. However, the characterisation of the Ayurvedic Industry (in terms of a history of collaboration), though consistent with economic theory on firms is a non-replicable and reductionist

narrative. The case studies the regional clusters and interestingly cites the Chyawanprash as an FMCG good. This raises some contradictions that do not find traditional explanations in the traditional knowledge and property rights system debate and is somewhat misplaced in this Part II.

Further, the product diversity in the case of Chyawanprash, coupled with the fact that no single actor is engaging in product quality innovation, through quality upgrading and that innovation doesn't proceed seamlessly, even with lack of proprietary innovation should reveal the comparison with structuring of innovation through transactional value. Further, it should reveal the issue of quality standards, in relation to manufacturing processes and the overall preponderance of value addition which is where the Chapter succeeds.

I am of the view that the collaborative context based on geographical proximity runs counter to the narrative on relational proximity, search for external capabilities like manufacturing (in view of the reversed dynamic overall on downstream activities). A more interesting prospect is that in view of the search for external capabilities (due to the shift to manufacturing good practices), what is the impact on internal coherence of firms.

Chapters 14 examines the scope of Telemedicine sector, in terms of challenges and opportunities. In terms of the analytical framework, the attempt to show geographical clustering is either absent or is assisted by the State goes to support a centralist command and control paradigm, which is no longer of value. Given the huge investment, a question worth asking would have been the overall attitudes, perceptions, and beliefs of users and non-users about telemedicine and whether it can serve to replace the problem of healthcare distribution, especially for rural households. That being the case, whether this presumes a trajectory of technological determinism or social construction of technology as healthcare technology innovations are known to demonstrate is unclear. The challenges identified by the author are a shortage of healthcare workforce, infrastructure, funding, technical skills, poor connectivity and policy initiatives which to my mind cannot be addressed only by demand-led factors and require supply-side factors like technical skills, workforce, etc.

The Chapter on Biotechnology Industry Potential (Chapter 16) share from a paradigmatic conflict of themes like discussion of genetic engineering-based biotechnology clusters, whereas the Chapter on Marker Assisted Selection (Chapter 15) emphasises the utility of alternative paradigms, other than genetic engineering, which to my mind is better suited to the linkage in consideration. However, the same maybe criticised as discussing innovation (as a technological system), without connecting the various units of analyses, particularly regional that it should demonstrate how cluster activity can be

furthered in that context. In view of the chapter on technological incubators (chapter 17), a question arises whether the innovation problem is reducible into a problem of entrepreneurship in the Indian context. However, equally, I am of the view that a framework other than national system of innovation should have addressed the issue of its relevance in the post globalisation context, more so the context discussed. Further, the choice of variables is not adequately reflected in the discussion. The ideation, creation, and innovation of knowledge is thus a far call in view of previous Papers and the progression is flawed.

Assuming the heterogeneity of actors argument outlined above, the areas identified for policy concern defy easy formulation and any attempt is appreciated.

Here, Chapter 18 addresses what is undoubtedly an important issue on supply related factors like Skilling workforce. However, the characterisation of the sociological impact of elite educational institutions on aspiring students, through a case study of the Coaching, helping students prepare for the Indian Institutes of Technology is not an appropriate match for the flow of logic followed by this Volume. Knowledge divide seen from the prism of the Educational access divide is an essential aspect, but it stands out in the absence of the linkage of skill supply with Sustainable Education and much less innovative tendencies among students. However, the Paper works at a level to demonstrate how the dynamics of education that doesn't provide this orientation is sub-optimal and that the prioritisation of educational values (in the realm of instrumental ones like financial stability, social prestige, etc.) has been quite the norm in the Indian context.

Chapter 19 attempts an ambitious survey of the Micro, Small and Medium enterprise sector in terms of innovation strategies employed. The key idea is that their productivity as actors is not efficient across sectors. The path dependency in terms of lack of product innovation, compared to process innovations, is well-entrenched from this Survey. It, however, diverges with Chapter 1 on its findings on organisational and marketing innovation, which merits further attention. The usual disclaimers on studies with self-reporting bias apply here.

Chapter 20 identifies the manufacturing sector in India, which provides further refinement to the previous Chapter and serves to detail preponderance of various value chain activities. This analyses a regional pattern to the same, suggesting that this regional imbalance be addressed. This study is broad-based to 23 sectors of the Indian Economy and provides valuable insights from secondary data. However, it could have engaged with micro-trends and undertaken an investigation of sector-specific dynamics to show the relative importance of levels of innovation systems. This serves to underscore the oligopolistic nature of Industrial ownership across key sectors but does not

go so far to cite any implications for innovation. The interpretation should nuance the discussion in previous chapters on sectors and should have logically preceded.

Chapter 21 deals with growth, productivity, and Innovation in this MSME sector, focussing on Indian Manufacturing Industries to derive the linkages thereof in terms of firm characteristics like capital intensity, export share, labour productivity, technology intensity, etc. The only problem with that dialectic is one of communication, in terms of understanding of the process aspects of Innovation and not as a structured economic activity. The labour-intensive nature of industrial activity appears from this Paper to be the main culprit behind productivity losses. Seen from a welfare perspective of employment augmentation, this can be severely criticised as a form of development that is unsustainable in our context.

Chapter 22 explores an inclusive framework for growth in Indian agriculture, in terms of the previous chapters of this part and errs in entrenching growth as derived only from statistics. However, the effort in establishing the economic and social heterogeneity of Indian agriculture innovation is laudable for its focus on natural resource management, which is almost the starting point for this book and where it consolidates the entire trajectory into a macro-view of resource-based industries. This addresses the sustainability-Innovation linkage well in part associated with food security concerns. The structural factors are well-identified. However, the formal discussion of Indian agriculture doesn't deeply engage with issues in my view.

Finally, the piece on perspective places regional considerations of sustainability and innovation as important, tackles the issue as one of a definition of the Regional Innovation system, among others. The challenges of regional Innovation system are seen from the prism of successful commercialisation which has its own merit and demerits. The piece identifies critical success factors both generic components like supply chain analysis, resource and skill mapping as important. The integrated approach to sustainability and Innovation is emphasised. However, ideas on modes of implementation through modelling and data analytics leave room for healthy debate on the feasibility of goals identified. While this Book is definitely instrumental to look at evidence generated from the periphery, the need for going behind the statistics into qualitative aspects, dynamics, and evolution is more apposite as is the divide between the formal and informal, another key theme in this Volume. The execution in terms of the division of parts somewhat overlooks the overall preponderance of Industry into formal and informal sectors. That being said, the book overall does take you in a direction that provokes the thought process, even if in parts and manages to do well through mapping the evolution of the Indian Innovative ecosystem. A good read

for policy analysts seeking to discern and engage with science policy studies. However, better editing in parts and chapter transition are particularly necessary to maintain the flow of logic. The effort of editors in bringing together various thematic threads is appreciated, but their coalesce into the big strand on sustainable development and Innovation is frankly an ongoing Project.

**Reviewed by**

**Ashish Gosain**

Centre for Studies in Science Policy, School of Social Sciences-II, Room No. 223,

Jawaharlal Nehru University, New Delhi – 110067, INDIA.

E-mail: ashish27\_sse@jnu.ac.in, ashishgosain@gmail.com

**DOI:** 10.5530/jscires.7.1.10