

Annual Report of

the Planning

Commission Unit for 2011-12

Centre for Development studies

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Kerala

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Personnel

Chair Professor: Dr Sunil Mani

Research Assistant: V S Sreekanth, MPhil

A. Completed Research

1. Foreign R&D Centres in India, An Analysis of their Size, Structure and Implication (joint with Rakesh Basant, Indian Institute of Management, Ahmedabad)

The study measures the contribution of MNCs to the generation of innovations from India. The focus is on innovations that are carried out in foreign R&D Centres. After having mapped out the size of this sector, the study develops a way of classifying them into two categories on the basis of their actual record with respect to performance of innovations. Further we survey the policies that are available in India to promote FDI in R&D services. The study also identify the characteristics of these foreign R&D centres in terms of a number of indicators like their, size, domain expertise, physical location and then it distils out the interaction of these centres with India's National System of Innovation. The latter is carried out through a primary survey. The contribution of this study is an identification of the size of foreign R&D Centres in India from official sources of data and its actual working. The study has thus a number of pointers for public policy for promoting this activity so that it is beneficial to the host economy of India.

Output: [available as a Working Paper of Indian Institute of Management-Ahmedabad](#)

2. Liberalisation of Technical Education in Kerala:

Has a Significant Increase in Enrolment Translated into increase in Supply of Engineers? (Joint with M Arun, Society for Promoting Alternative Computing and Employment)

There has been a significant increase in the places for undergraduate engineering degree programmes in the state. This has happened over the last decade by licensing a number of privately owned engineering colleges. Consequently, enrolments in engineering increased from about 2800 in 1991 to about 28,000 in 2008. The study analyses whether this increase in potential supply of engineers has resulted in actual supply of engineers. In fact, after a careful analysis of a unique data set the study reaches the conclusion that actual outturn rates have been steadily declining and especially since 2004. This decline is observed both at the aggregate level, across

different branches and across different colleges. It then hypothesises about the probable causes for this steady decline in outturn rates and has identified this in terms of two prominent causes. The study then concludes with the larger implications of this state of affairs.

Output: [available as a Working Paper of Centre for Development Studies](#)

3 On the road to self reliance in high technology, Role of Public Sector Enterprises in India

The paper analyses the position and performance of India's public sector enterprises over the period since economic liberalisation and increased integration of India's economy. The ensuing analysis shows us that there is enough quantitative evidence to show that performance, both financial and technological, have shown some sharp increases. However technological performance seems to be concentrated in a few enterprises and as such is not widespread. If the country wants to be self-reliant in certain areas of high technology, it has to instill and nurture the spirit of innovation across a much larger number of enterprises.

4. Internationalisation of Innovation, A survey of public policies for its support in the Indian Context

India is now becoming an important location for innovative activities by MNCs. Over the last decade (2000-2010), much of the knowledge assets that are created in India are either by branches or subsidiaries of MNCs. Also during the period many Indian companies themselves, of which the conglomerate firm Tata is a fine example, have themselves become MNCs investing abroad to gain access to state-of-the art technologies markets and in some cases even key natural resources. It was also during the period when India's economy had become much more globalised. Against this context, the basic purpose of this paper is to survey the extent to which public policies have changed to encourage not just the internationalisation of India's economy, but especially its innovative activities. Although it must be stated at the very outset, that this process was by no means straightforward. Sometime some policies, which were not exactly targeted at internationalisation, also may have contributed to it, albeit, in an indirect fashion.

Towards achieving the basic objective, the paper is structured into four sections. The first section measures the nature and extent to which India's economy is globalised. Here we consider two indicators of globalisation: a narrow index and a broader index. The purpose of this section is to show the increasing internationalisation of India's economy. The second section, measures the extent to which innovative activities in India are internationalised. We infer this from three indicators: (i) Increasing share of MNCs in the performance of industrial R&D in India; (ii) growth in R&D services from India; (ii) ownership of Indian patents in the US. Using these three indicators we attempt to show that India's innovation system is, increasingly, getting internationalised. The third section will survey the main policy instruments that are

put in place to increase internationalisation of innovation. We divide these policies into three: (i) policies for promoting innovations in general. These policies can be further divided into those which are umbrella policies such as the Science and Technology Policy of 2003, or the TRIPS compliance of Indian patent regime and more specific instruments for promoting R&D like the tax incentive scheme. The second set of policies which are more direct at enhancing internationalisation are the policies on both inward and outward FDI. Of particular emphasis is the liberalisation policies which allow Indian companies to invest abroad and it can also be shown that one of the prime reasons for this for acquiring innovation and technological capability. Third is the policy on high skilled migration from India. Although there are no explicit policies on high skilled migration from India, the government has been easing the bottlenecks on one of the dominant routes through which high skill migration takes place namely the education route. Policies for this route include those dealing with the financing of foreign education of Indian students and also encouraging a number of collaborative agreements between Indian and foreign universities. The fourth and final section summarises the main findings of the paper and also highlights the fact that changes in international governance rules may have actually reduced the space for domestic policies to play.

5. Evolution of the sectoral system of innovation of India's aeronautical industry

India is one among the few developing countries that have sought to establish an aerospace industry. The industry has two components, namely aeronautical and astronautical. I first map out the sectoral system of innovation of this industry which is actually located as a cluster in the south Indian city of Bangalore. The paper identifies the three building blocks of the sectoral system: lead actors, knowledge or technology domain, and the demand. Changes in each of these blocks over time are discussed. The study concluded with a comparison of the performance of the sector in terms of exports and competitiveness and also delves on the policy instruments that are required for placing the industry on a sure flight path.

Accepted as a journal article in the *International Journal of Technology and Globalization*

B. On-going Research

1. Innovation Process in Indian Software Industry

-Joint Author(s) : Martin Fransman (University of Edinburgh) and M Arun (Society for Promotion of Alternative Computing and Employment)

-Date of commencement: December 20, 2012

-Expected date of completion: June 30, 2012

-Research theme in which to be listed: (Refer page 5 for listing of themes)

-Publication plan (name of journal, book etc in which you plan to publish):
(CDS working paper, journal, chapter in a book): Jour

2. TRIPS compliance of national patent regimes, an analysis of its potential and actual effects on innovative activity

Abstract: All developing countries with the exception of the least developed ones have made their Intellectual Property Right (IPR) regimes TRIPS compliant with effect from January 1, 2005. The most important manifestation of this is the acceptance of product patents in pharmaceuticals, agrochemicals and food products. This acceptance of product patents is expected to have both positive and negative consequences. On the positive side this may spur innovations in a number of industries and on the negative side it may actually reduce innovations of an incremental nature affected through reverse engineering. Further it may also precipitate patent litigation between MNCs and local companies and between local companies. The study examines these potential and actual consequences both at the macro level and at the levels of industries such as Automotive, Pharmaceuticals, and Agrochemicals across Brazil, China, India, South Africa and Thailand.

-Sponsor : The Earth Institute, Columbia University, New York, USA

-Other members (if any) : Richard Nelson, Sudip Chaudhuri, V K Unni, Patarapong Intarakumnerd, Luciano, Povova and Hermi Boraine

-Date of commencement: September 2010

-Expected date of completion : September 2012
(please indicate if you are revising the date already reported last year):

-Seminar/workshop plan (if any): Two workshops at Columbia University in September 2010 and May 2011

-Research theme in which to be listed: (Refer page 5 for listing of themes):
Industry, Innovation and Infrastructure

3. Rise to market leadership

Abstract: A number of firms from developing countries have become successful and innovative and have become important companies not only in their own home countries but abroad as well. Three industries where such firms are likely to exist are Automotive, Information and Communications Technology, and Pharmaceuticals. The proposed study identifies a collection of such firms from three fast growing emerging economies of Brazil, China and India and identifies

the relationship between learning and capability building at the firm level and systemic factors that may have contributed to the success of these firms.

Sponsor : The Earth Institute, Columbia University, New York, USA

-Other members (if any) : Richard Nelson, Franco Malerba, Zheng Liang, Bruno de Araujo, Luiz Ricardo Cavalcante, and Arun M

-Date of commencement: January 2012

-Expected date of completion : December 2012

-Seminar/workshop plan (if any): One Workshop at Columbia University during April 10 and 11, 2012 and a panel at Globelics 2012 at Hangzhou, China in November 2012

-Research theme in which to be listed: (Refer page 5 for listing of themes): Industry, Innovation and Infrastructure

C. Publications

- **Journal Articles**

Mani, Sunil 2011 ‘Bridging the digital divide, Indian experience in increasing access to telecommunications services’, *International Journal of Technological Learning, Innovation and Development*, Vol. 4, Issue 4.

Mani, Sunil (2011), ‘National Manufacturing Policy: Making India a Powerhouse’, *Economic and Political Weekly*, Vol. XLVI, No: 53, December 31, pp. 16-19.

Mani, Sunil (2011), ‘‘Guide to data on India’s Automotive Industry’, *International Journal of Development and Social Research*, Vol. 1, Issue no: 11, pp. 81-86.

- **Chapters in Books**

Lee, Keun, Sunil Mani and Qing Mu 2011, ‘Explaining divergent stories of catch-up in telecommunications equipment industry in Brazil, China, India and Korea’ in Franco Malerba and Richard Nelson (eds.), *Economic development as a learning process: differences across sectoral systems*, Cheltenham, UK and Northampton, Mass: USA: Edward Elgar.

- **Working Papers**

Rakesh Basant and Sunil Mani, *Foreign R&D Centres in India: An Analysis of their Size, Structure and Implications*, Indian Institute of Management Ahmedabad, W.P. No. 2012-01-06, January, 2012

Sunil Mani and Arun M, *Liberalisation of technical education in Kerala: Has a significant increase in enrolment translated into increase in supply of engineers?*, Working Paper 448, Centre for Development Studies, Trivandrum, March, 2012.

- **Other Publications**

Mani, Sunil (2011), 'Tryst with technology' Review of the book, *Reinventing India* by Raghunath Mashelkar, *The Hindu*, November 8, 2011

D. Seminars/Conferences/Lectures attended or presented

- Gave a public lecture on "Innovation and growth in China and India" at the IDRC Headquarters, Ottawa, Canada, May 5 2011, <http://www.idrc.ca/EN/Themes/Economics/Pages/EventDetails.aspx?EventID=66>
- Presented a paper on "Evolution of the sectoral system of innovation of India's aeronautical industry", at the international seminar on The International Civil Aircraft Industry, Pulling ahead, falling behind and catching up, organised by Canada Research Chair on Management of Technology, Université du Québec à Montréal (UQAM), Montreal, May 6 2011
- Gave two lectures on "Measuring Innovation" and "Financing of Innovation" at the 7th International Ph.D. school on 'National Systems of Innovation and Economic Development', Globelics Academy 2011, University of Tampere, Finland, May 17 and 18, 2011.
- Participated and presented a paper on "TRIPS compliance of Indian Patent Regime, An analysis of its effects on innovative activity at the macro level" at the project meeting on "TRIPS Compliance of National Patent Regimes and its Impact on Innovative Activity in Developing Countries", Columbia University, New York, May 24-25, 2011

- Gave a lecture on “Have China and India become more innovative since the onset of reforms in the two countries?”, National Centre for Science and Engineering Statistics, National Science Foundation, Washington D.C., May 26 2011
- Participated in the meeting at KITEs, Bocconi University, Milan, Italy to initiate a new project titled “Rise to Industrial Leadership”, September 1-2, 2011
- Chaired a session and presented a paper titled “Sectoral system of innovation of the Indian Automotive Industry, Enhancing innovation capability through internal and external sources” at the 2011 Atlanta Conference on Science, Technology and Innovation Policy, Georgia Institute of Technology, Atlanta, USA, September 15-17 2011
- Presented two lectures, ‘Creating national champions, The Indian Experience’ and ‘ Diffusion of innovation surveys across Asia’ at the training programme on Design and Evaluation of Innovation Policy in an emerging country context organised by the United Nations University-MERIT and Economic Planning Unit, Prime Minister’s Department, Malaysia, Putra Jaya, October 31-November 4, 2011
- Participated and made a presentation on innovation Surveys at the first meeting of the International Advisory Steering Committee for the Centre for Science Technology and Innovation Indicators, Human Science Research Council, Republic of South Africa, at CeSTII, Cape Town, November 9-11
- Presented a paper, The Mobile Communications Services Industry In India: Has It Led To India Becoming A Manufacturing Hub For Telecommunication Equipmet?”, at the 9th International Globelics Conference, Buenos Aires Argentina, November 15-17, 2011
- Presented a lecture on TRIPS compliance of Indian Patents Act and its potential and actual effects on innovative activity in Indian Industries at the National Training Programme for Scientists & Technologists on “IPR & WTO Issues” at Administrative Training Institute, Department of Atomic Energy (DAE), Anushakti Nagar, Mumbai January 9, 2012
- Presented a lecture on ‘High Skilled Migration from India, An Analysis of its Economic Implications’, to a group of visiting faculty and students of University of Oslo, Norway at St Gits Institute of Management, Kottayam, January 12, 2012
- Presented a paper on ‘High Skilled Migration from India, An Analysis of its Economic Implications’ at the international seminar on ‘Young People and Migration’, Rajiv Gandhi National Institute of Youth Development, Sriperumbudur, January 18, 2012

- Presented a paper titled, ‘On the road to self-reliance in high technology, Role of Public Sector Enterprises in India’, and was discussant to another paper at the international conference on ‘The State’s Return to Business: Government-Linked Companies in the Post-Crisis Global Economy’, organised by University of Malaya, Siam Reap, Cambodia, February 9-10, 2012.
- Presented a paper (with Arun M) on ‘Liberalization of technical education in Kerala: Has a significant increase in enrolment translated into increase in supply of engineers?’, at the conference on Kerala’s Economy and Society, Situating the Present, Imagining the future’, Centre for Development Studies, Trivandrum, February 26-27
- Designed and taught a ten lecture elective course on “Innovation and Technology Policy” at the PGPEX programme, Indian Institute of Management, Calcutta, January 31-February 7, 2012
- Participated and presented a paper ‘Innovative activities in China and India, Are there any lessons for it for other BRICS Countries, at the 4th BRICS Academic Forum: Stability, Security & Prosperity, New Delhi, March 5-6, 2012

E: Training programmes coordinated at the Centre

E.1. Using Internet for Applied Development Research, Version 7.0, April 27-29

-Sponsor(s): Paid for by Course Fee

-Name(s) of other coordinator(s) if any Nil

-Number of participants: 15

E.2. Teaching Innovations Programme in Economics for College Teachers (TIPE Version 5.0), November 28-December 9, 2011

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-Sponsor(s): CDS under the K N Raj Fellowship Scheme

-Name(s) of other coordinator(s) if any Ni

E. 2 .Teaching at training programmes:

E 2.1 Using Internet for Applied Development Research, Version 7.0

-Topic(s): The first step: articulating your research problem

E 2.2: : Teaching Innovations Programme in Economics for College Teachers, Version 5.0

-Topic(s): Industrial Sector and Economic Liberalization

-Teaching notes, if any, developed and used:Published as a chapter of a text book, Prakash, Alwin , *Indian Economy*, Delhi: Pearson, pp.416-431

F. Seminars coordinated at the Centre

- *Foreign R&D centres in China and India*

-Sponsor(s)IDRC

-Date(s) November 28, 201

-Number of participants: 30

- *Kerala's Economy and Society: situating the present and imagining the future*

-Sponsor: CDS

-Dates: February 26 and 27, 2012

-Number of participants: About 100

G. Professional involvement outside Centre

- Member, Advisory Steering Committee, Centre for Science, Technology and Innovation Indicators (CeSTII), Human Sciences Research Council (HSRC), Republic of South Africa
- Project leader, *TRIPS compliance of National Patent Regimes*, Research project under the catch up series, The Earth Institute, Columbia University, New York, USA
- Project Leader (along with Professor Franco Malerba) , *Rise to market leadership* Research project under the catch up series, The Earth Institute, Columbia University, New York, USA

- Contributor and reviewer to *Science and Engineering Indications 2012*, National Centre for Science and Engineering Statistics, National Science Foundation, USA.
- Instructor, Globelics Academy , Summer School for PhD students, University of Tampere, Tampere, Finland
- Honorary Visiting Professor, Faculty of Economics, University of Ljubljana, Slovenia
- Honorary Visiting Professor, Institute of Public Enterprise, Hyderabad, India (IPE- an ICSSR institution)
- Honorary Fellow, National Institute for Science, Technology and Development Studies (NISTADS- a CSIR Institution)
- Referee to : (i) Research Policy; ((ii) World Development;(iii) International Journal of Technology and Globalization; (v) Economic and Political Weekly; and iv) Edward Elgar
- External Examiner to PhD thesis from Indian Institute of Science and Guru Nanak University, Punjab.
- Member, Editorial Advisory Board, *Research Policy*, Elsevier
- Member, Editorial Board, *International Journal of Development and Social Research*, XIMB, Bhubaneswar.

H. Teaching and supervision at the Centre

- **Teaching at the M.Phil programme:** : Course No. 304: India and the global economy No. of sessions-----10; Course No: 402: Indian industrial Development

- **Supervision**

- M.Phil No. of students : 3 Approx. No. of days : 365
- Ph.D No. of students : 2 Approx. No. of days : 365

I. Administrative responsibilities at the Centre

- Coordinator , MPhil Programme in Applied Economics
- Member Programme Advisory Committee for MA , MPhil and PhD
- Coordinator, K N Raj Fellowship Programme
- Member of the Sub-Committee for M A in Applied Economics
- Vice Chairman of the IT Committee
- Chairman of the Library Committee (only from March 2012)

J. Research Plan for 2013-14

See the section on on-going research on page 3 onward.