

**FIRST CDEIS-INDIALICS INTERNATIONAL CONFERENCE ON  
DEVELOPMENT AND INNOVATION IN THE EMERGING ECONOMIES  
November 16-18, 2012**

**Rapporteurs' Report**

**16.11.2012: Inaugural Session**

The inaugural session of the Conference began with Prof. Inderjeet Singh welcoming the delegates and guests. The head of the Economics Department Prof. R.K. Bansal introduced the department and its sister concerns, the courses run by it, and provided information regarding the students and the faculty members of the department. The Conference theme was introduced by Prof. Lakhwinder Singh. He elaborated on the close connection between development and innovation, and stressed the need to understand how societies progress, in order to understand the process of economic development.

The inaugural address was delivered by **Dr. P. Banerjee**, Director, CSIR-NISTADS, New Delhi. His address was titled 'On a Few Issues Pertaining to Development and Innovation in Emerging Economies'. Dr. Banerjee considered development and innovation as more or less synonyms, as both were about challenging the current order and incumbent power. This is to say that development and innovation refer to powers of making rules, exercising control over rule implementation and in owning assets that are upwardly valued. The central focus of development and innovation would, thus, be rules and powers to make value, and finance to own valued assets.

Dr. Banerjee was of the view that the Schumpeterian idea that innovation as a change is effected by an entrepreneur, is out of place in the current context. He emphasized that development and innovations cannot be brought about without the assistance of state and transnational provided finance. He also stressed the importance of time period for emerging economies, and cautioned against blindly following other economies.

The inaugural address was followed by the Keynote address, which was delivered by **Prof. Mammo Muchie** from Institute for Economic Research on Innovation, Tshwane University of Technology, South Africa. His address was titled 'Locating Development Economics within a Unified Innovation System'. In his

address he explained how a system of innovation that combines knowledge, learning, research, innovation, and capability building can provide an alternative framework of the study of development and underdevelopment. According to him, this can be done by consciously developing linkages and combinations between economic and non-economic structure and actors, formal theories and deepening evolutionary economic dynamics to include new thematic areas such as national economic integration in relation to reducing dependency on donors in different types of developing and transition economies.

He gave Nelson and Winter's explanation for formal and appreciative theory, according to which formal theory is a source of ideas for appreciative theory and vice-versa. According to Prof. Muchie, in general, drawing linkages or connection between these distinct forms of theorizing can enrich understanding of economic enquiry. But it is not clear how much significant interaction and learning takes place between the formal theory and appreciative theory with mutual gain to each other.

Prof. Muchie highlighted the Appreciative theory in this innovation system genre which has produced such terms as the knowledge-economy framework, the learning economy framework and with the Globelics initiative, a further development has occurred. Globelics has combined together knowledge, innovation, learning and capability building and suggested research applicable to the problems of development and underdevelopment by translating innovation system into: 'learning, innovation and capacity, capability and competence building system'. He pointed out that there have been varieties in the presentation of systems of innovation perspectives since the 1980s. Theories on innovation and their use have gradually expanded their focus and complexity to include the environment and industry in which firms operate. Its use was explained in five major areas: (i) spatial; (ii) industry and technology specific; (iii) in terms of innovation types; (iv) in terms of level of technology/innovation complexity; and (v) in terms of economic and social objectives.

Integrating the concept of system of innovation with economic development, Prof. Muchie opined that system of innovation helps to focus on knowledge and learning activities among various actors and institutions that provide competitive advantage in the long-term. The concept of innovation system captures the specific interaction of 'innovation-knowledge' as the independent variable and spatial, sectoral

and institutional arrangements as the dependent variable in the context of the activities and actions to bring about transformation and development. As a critique, the concept of 'system and innovation' can be used by challenge ideas about wealth accumulation based exclusively on static comparative advantage imparting development features to a given national economy and as a metaphor, it inculcates a mental attitude of 'can do it yourself' by creating self-reliance.

Thus, development is driven by the intellectual achievements, discoveries, inventions, transformations and progress that a nation has accumulated in its history and is likely to improve the way it may be productively used especially when the innovation system framework is applied increasingly to the problems of development and underdevelopment.

Prof. Muchie also dwelt on the African Development Agenda. He stressed on the need to develop a unifying economic growth strategy that works for Africa, and there is a need to open the door for theories that are grounded and contextualized in African setting.

Prof. Muchie's keynote address was followed by the Presidential Address delivered by **Dr. Jaspal Singh**, Vice-Chancellor of Punjabi University, Patiala. He elaborated on how industrial revolution gave birth to revolutionary innovations, but the world economic order at maturity of industrial revolution has divided global economy between developed and underdeveloped. He lamented that the innovative system of development has undergone change which has generated accumulation from 'need based' to 'greed based'. Mother Earth has suffered in the process and now it is the emerging economies which face a challenge in overcoming this crisis. He said that development will take place in real terms only if the marginalized sections of society are given proper representation in the development process.

Towards the end of the inaugural session, Prof. S.S. Khehra, Dean Academic Affairs of the University proposed the vote of thanks.

### **Technical Session I**

The first technical session was **chaired by Prof. Surjit Singh** from IDS, Jaipur. Three papers were presented in this session. The first paper was presented by Dr. Dinesh Abrol, NISTADS-CSIR, New Delhi. In his paper titled 'Pro-poor Innovation: Making Critical Reflections on the Indian Experience', examined the

experience of implementation of pro-poor innovation making schemes. Tracing the evolution of the implementation of pro-poor experiments in innovation making in India beginning 1950s, he also studied the impact of these efforts to improve rural livelihoods. He was of the view that though the state, public science and technology organizations and social movements strived hard to promote pro-poor innovation making, the success attained was limited. He presented three case studies of "politics of institution building in higher education" (The case of Radhakrishna Commission of Higher Education: 1948); the promotion of knowledge production in State sector R&D agencies (the case of CSIR); and the "innovation system building by social movements for pro-poor technology and implementation (assessment of KVIC and other rural development programmes). His analysis demonstrated that pro-poor innovation generation and diffusion in India has not been successful due to the fact that such innovation systems were constructed as a residual socio-technical system without ensuring their systemic competitiveness, rather than with the aim of achieving social justice and economic empowerment of the poor. Stressing on the need for tackling issues of diversity in demand, resource regeneration and skill enhancement, Abrol cautioned against putting too much confidence into the ability of the corporate sector.

The second paper, jointly authored by **Prof. Inderjeet Singh, Ms. Minaxi Bansal**, and **Bhavna Chhabra**, was presented by Ms. Minaxi. In their paper titled "Innovation Inputs and Performance in Indian Banking" they have analyzed the relation of innovation inputs and performance in Indian Banking for the period 1998 to 2010. Empirical prognostication of the relation has been done using the correlation regression and other techniques. Their study confirms that contribution of technology to banks' performance has a differential behaviour. It contributes positively only to those banks where some preconditions conducive to performance are existing e.g. trained man power, size and scale of business. It shows that banks performance is related not just to its technological stance but to other areas of competencies. The third paper was jointly authored by **Dr. Piyush Verma** and **Hemant Sharma**, and presented by Dr. Piyush on the theme "Technological Competitiveness and Public Policy Challenges: Issues in Measurement and Building Innovation Capabilities". In the present era of Globalization, increasing integration and rising competition have

put a fair amount of pressure on emerging economies to build their technological and innovation capabilities in order to develop new technologies, new products, processes and also improve the ability to capably absorb and assimilate technologies which are developed in the advanced foreign nations. There are different routes varying from marketing mediated (trade, FDI, licensing and joint ventures) to non-market mediated (imitation, reverse engineering and publications like journals, data and patents) to transfer the technology. However, proper assimilation, absorption and adaptation are equally important for technological development and higher economic growth. The presenters broadly used two approaches – Global Competitive Index (GCI) and Technology Achievement Index (TAI) in order to examine different phases of technological capability progression paths. GCI divides countries into three stages – Stage I (Factor driven), Stage-II (Efficiency driven), Stage-III (Innovation driven) and also captures dynamism in terms of explaining transition from stage-I to II and from State II to III, whereas TAI which assess the level of technological progress of the countries classifies them into four categories – leaders, potential leaders, dynamic adopters and marginalized nations. These two approaches together provide deep insights about the level of technological capability which is achieved by the various countries and further provides suitable policy interventions to develop technological competitiveness. The states and governments after examining the different phases of technological capability progression paths can suggest appropriate public policy by choosing among the various alternative approaches (National Innovation System, Triple-helix and Industrial clusters) for building technological and innovation capabilities. All the above approaches focus on building technological capabilities but differ in their respective actors and interdependence among them.

The session ended with a lively discussion in which a number of delegates participated and raised issues pertaining to the content of the presented papers. It was argued that there is a need to evolve new methods of measuring innovations and resolve the dilemma between new economy innovations and old economy innovations.

### **Technical Session II**

The second technical session, **chaired by Prof. M.S. Sidhu** from PAU, Ludhiana had two presentations. The first paper in the session was presented by **Prof.**

**Surjit Singh.** He presented a paper "Innovations: Finance, Employment and Social Security: An Outsiders' View". He emphasized the role of innovation in the modern society and explained its link with Finance, Employment and Social Security with the help of macro and micro level studies. Finance and Innovation was explained using three arguments: firstly, increasing disparities in income and development across countries; secondly, domestic firms engaging in more adaption and imitation of already created technologies by the foreign firms; and thirdly, competitive firms innovating more than the older firms. All these arguments have simply one answer and that is lack of incentives and R&D investments across countries, regions and firms. The presenter also explained the effect of innovation on employment particularly highlighting the effect of product and process innovation. Studies have shown that process innovation account for a smaller share of change in employment and product innovations are an important source of firm-level employment growth. The presenter also says that the social security systems (both individual and collective security) should be encouraged so as to promote initiatives for innovations. According to the presenter, government is already doing its work in this field but all in vain because even though the spending on the social services is high but system is fragmented and the coverage is poor. Precise labour laws and contracts that exhibit tolerance to failure are a must for a case like India. Thus, the presenter concludes in Kalecki's words that 'innovation effect is a development factor and thus contributes to the maintenance of the long-run upward trend'.

The second paper, jointly authored by **H.S. Gill** and **Poorva Gill**, was presented by H.S. Gill. In their paper on 'Energy, Technology, Development, Economics and Management', they discuss problems of electricity generation, at the levels of conceptualization, policy formulation and implementation level. Well established technologies of energy generation like use of bamboo, thorium etc. are not being implemented simply because decision making in favour of this technology and "aggressive application" is missing. Further, policies followed are not attractive from investment point of view, although potential of conventional energy sources is substantial to meet requirements. There are problems at the implementation level too. There are synchronization and coordination gaps because as many as five ministries in the central govt. deal with different components of energy sector and these results in

overlaps, deficiencies and coordination failures. The paper also drew attention to the issue of energy conservation. The authors summed up by stressing on the need to develop new and sustainable energy areas, and translate innovations into realities.

In the session, issues were raised regarding factors behind unemployment, social security and sustainable development. It was argued that without employment, development cannot be sustainable. The paper on energy was discussed in the light of the centralized prescriptions, but local generation and accountability issues.

### **Special Lecture I : Rakesh Basant**

The first day of the conference ended with two special lectures, the first of which was by Prof. Rakesh Basant from IIM, Ahmedabad. The lecture was **chaired by Prof. Rasigan Maharajh.**

The lecture was titled 'Analyzing Innovation Eco-System in Developing Economies – Emerging Issues for Research in India'. Prof. Basant used National System of Innovation (NSI) as a starting framework of enquiry to identify gaps in context of developing countries. He opined that there is a need to conceptualize innovation policy differently, with sharper focus on linkages among NSI actors. More need to be done to understand the role of each NSI actor, and focus more on innovation driven by new enterprise. The NSI framework has not focused enough on new enterprise. Most NSI have 4 actors – Governments, Universities and Higher Education Institutions, Research Institutions, and Business Enterprises. The NSI research focus should be on linkages between and among the actors. The policy need is to ascertain ways of enhancing complementarities and support all kinds of innovations.

Discussing all the four actors, Prof. Basant also presented two case studies – that of IISc and National Chemical Laboratories, the former an autonomous institution and the latter a public sector laboratory. He concluded his lecture by raising some research agendas:

- How to ensure that complementarities among different policy instruments are realized?
- How to make higher education system innovation focused?
- What models of innovation based enterprise creation through UIIs (University Industry Linkages) or incubators are appropriate?

- How to remove obstacles for new innovation driven enterprises?
- Can new enterprise creation, mentoring and funding be linked to the traditional entrepreneurial system?

The lecture was followed by concerns being raised regarding need for demarcation between pro-people research and private profit research, paying greater attention to institutional innovation, and drawing lessons from manufacturing innovations.

### **Special Lecture II : Rasigan Maharajh**

The second special lecture was held during the conference dinner, and was delivered by Prof. Rasigan Maharajh which will chaired by Keun Lee from South Korea. He delivered a special lecture on 'Mind the Rhetorical Gap: Innovation Policy and the Challenges of Economic Development in Contemporary South Africa'. His paper is a response to the questions being raised about the quality of the transformation of South Africa into a non-racial, non sexist and united country especially after the massacre of mineworkers in Marikana in the North West province of the country. Maharajh traced the economic history of South Africa in the last two decades. He analyzed some of the recent policy developments mooted around the challenges of economic development and also dwelt upon the emerging challenges for further research into the continuing evolution of the South African political economy. The shared concerns of the BRICS group of countries in their quest for structural transformation and sustained economic development, were also touched upon in the lecture.

Maharajh argued that the transformation of South Africa's Science, Technology and Innovations (STI) landscape provided enough evidence to capture the discourse of National System of Innovations (NSI) by vested institutional interests and utilizing it for a reformist agenda rather than to consider more radical solutions. This approach led to continuance of organization that existed under apartheid – reformed with employment equity targets being fulfilled, but with untransformed mandates and activities. Prof. Maharajh argued that the performance of the NSI must be primarily measured within the context of overall political economy, and South Africa's political economy remains largely untransformed. Although significant progress was achieved in the establishment of a united, non-racial, non-sexist and

democratic political regime, inequality and impoverization still persist. Hence, there is need for more direct and explicit policy prescriptions and instruments. This can be done through building a better NSI by improving the performance of science and technology institutions, increasing investments and human resource development and ensuring access to R&D infrastructures.

### **17.11.2012: Technical Session III**

The third technical session was held on the second day of the Conference. The session was **chaired by Prof. Pushpa Trivedi** from IIT, Bombay. The first paper in this session was presented by **Rajeshwari S. Raina**. In her paper 'Innovation for Development: Policy Trajectories and Reform for Rural India', she argues that if innovation has to work for development in India, then it is imperative that decision makers find ways to enable institutional reform specifically oriented to rural employment and incomes. She was of the view that despite the employment rhetoric, policy frameworks and programmes, production investments and technological capacities have focused more on export-oriented capital intensive growth, than on labour intensive growth. She called for changes in the policy, production and consumption components of the national innovations system to ensure relevant investment and production capacities, and consumption opportunities for the massive rural population. This can be achieved only through adequate policy and political support.

The second paper was presented by **Prof. B.K. Pattnaik** entitled "Mobilizing from Appropriate Technologies to Sustainable Technologies based on Grassroots Innovations". In his paper he acquaints us with the concept of "Appropriate Technology (AT)" and also the way it is used in developing as well as developed countries. 'AT' concept is used in the form of "Intermediate or low cost technology" to tackle problems like poverty, ill health, poor medical facilities and housing. On the other hand, it is used in the form of "Alternative Technologies" for tackling environmental issues and saving energy in the developed countries. Various thinkers and authors like M.K. Gandhi, EF Schumacher, J.C. Kumarappa and others tell us about the historical evolution of the "AT" concept in India. The paper included an empirical study of the social movement organization called "Honey Bee Network (HNB)" which does not show us the original discourse of 'AT', rather a shift in this

discourse – towards "Sustainable Technologies". Main objectives of the HNB are: (i) to protect the intellectual property rights (IPR) of the Grassroot innovators, (ii) to add value to the goods based on traditional and local knowledge and (iii) to develop the entrepreneurial abilities of the innovators by training them and providing them financial support. This HNB operates through three network organizations (i) SRISTI (Society for Research Initiatives for sustainable technologies and institutions), (ii) GIAN (Grassroot Innovations Augmentation Network) which was established with a view to link innovators, investment and entrepreneurs (iii) NIF (National Innovation Fund) which was setup in February 2000, by Govt. of India (DST).

The author concluded from his study that "Appropriate Technology (AT)" in India has shown a shift towards "Sustainable Technologies" whereby many technologies developed by grassroot innovators have been successfully commercialized and patented. This concept of "Appropriateness" does not even work in agriculture today where the recognition of alternative sources and local knowledge in the small scale industries and rural technologies favour more the issue of "Sustainability" and "Environment Friendliness" rather than "Appropriateness". The focus of research in HBN has been shifted from "Appropriability" to "Sustainability". Now, what makes these technologies "Sustainable" is a new issue to be discussed in the present arena.

In the third presentation, **Rajeev Sharma and Gurpeet Singh's** paper entitled, "Agricultural technologies access and farmer household's welfare: Evidence from India" took up the issue of access to modern technologies and their impact on the welfare of farmer household's in different regions of India. Using logistic regression analysis, it was revealed that controlling for other household characteristics, the access of modern technology has a significant positive impact on consumption expenditure in rural India. According to presenter from policy point of view there is a need to take some institutional measures that help the small and marginal farmers to increase their earnings.

### **Panel Discussion**

The third technical session was followed by a panel discussion on 'Innovations from South and Development of the Emerging Economies'. The discussion was **chaired by S. Inderjit Singh**, Joint Secretary, DST, New Delhi. Initiating the

discussion, S. Inderjit Singh emphasized the role of innovative ideas, adding that such ideas are needed everywhere, even while dealing with labour. Science and technology has to play an important role if inclusive growth is desired. He lamented the fact that in India, it is more of 'jugaad' (improvisation) rather than innovation. However, the importance of innovation has been recognized and initiatives taken by government are proof enough. However, a lot remains to be done.

**Dr. Rajeswari Raina** was not in favour of imitating the west for solutions of problems that are peculiar to our country. She dwelt on the contribution made by the Department of Science and Technology (DST) for rural development and discussed how DST can help other departments learn. She stressed on South-South collaboration and opined that there is a lot of scope for engaging in such collaborations to help agriculture.

The third panelist, **Dr. Rasigan Maharajh**, talked about the emergence of BRICS countries, and how these has been asked to carry a large part of the burden of climate change. He thus emphasized the need to have a strong IBSA (India, Brazil, South Africa) trilateral agreement. He also pointed towards the importance of basing studies on local innovations and production system.

**Prof. Keun Lee** talked about the changing engines of growth in China and established the close link between big business and growth in China. In this context he dwelt upon the Beijing Consensus to Middle Income Trap (MIT) in China, and innovation capabilities and world class business as the check points for MIT in China.

**Ms. Maria Cecilia Vieira** from the Embassy of Brazil in India mainly elaborated on how Brazil has a leading company in innovation managed by the Department of Science and Technology, as the funds created for development which previously went into basic research, now go towards innovations. She also made a mention of the gaps and constraints facing the country, but ended on an optimistic note that we can always learn from the past and find new ways and solutions.

The last panelist, **Prof. B.K. Pattnaik** pointed out that globalization is a threat to our indigenous knowledge system and practices. He said that we have been aping the west because modern science and technology is a product of the west. He was of the view that caste based guilds protect our indigenous knowledge in India, but there is a need to document and patent our indigenous knowledge.

The panel discussion was followed by raising of issues, questions and concerns by other delegates. Questions were raised as to what BRICS can do to build human capital, how can we bring in our own values for the welfare of all – to alleviate hunger and poverty. It was also pointed out that our education system is divorced from grass root problems, and so 'Need for Innovation' should be included in school and college curriculums.

#### **Technical Session IV**

The panel discussion was followed by the fourth technical session. The session was chaired by **Prof. Rakesh Basant**, and three papers were presented in the session.

The first paper was presented by **Dr. Elias Sanidas, Jisum Lim and Otgonbat Ishdagva**, entitled "Technology, Size of Firms and Sectoral Productivity: A panel data study of Korean Firms". In the paper they examined the role of technological innovations in the success story of Korea's economic growth. Technological innovations consist of two components: technical innovations (TTs) and organizational innovations (OIs). An analysis of Korean firms and sectors was carried out by using firm level panel data and sector-level data. The two models used – fixed effects and generalized method of moments – provided evidence that firm reorganization through OIs and TIs significantly improve the productivity of manufacturing firms and sectors in Korea. The sector level analysis carried out by them confirmed the gradual implementation of JIT/QC (just-in-time and quality control) in Korea in the last two decades. Overall, they examined the extensive data base to see the influence of the size of firms on productivity and all other factors such as technology, and arrived at the result that in general the size of firms is neutral to the influence of technology and all other factors on productivity.

The second paper was by **Buru Im and Keun Lee** entitled "Catching Up VS Advanced Firm: A Comparative Analysis of Korean and American Firms". They conducted a comparative study of Korean and U.S companies and empirically examined the effects of determinants of firms' performance namely, growth, profitability and firm value, in the two countries. The study used financial data of firms which were taken as independent variables viz. size, debt ratio, R&D intensity, advertisement intensity, intangible asset ratio, current ratio and investment, for the period 1990-2007. The performance in terms of the three said determinants was

compared and analyzed using regression analysis. The results of the study showed that average growth rate of firms in the 2000s did not show significant differences while in 1990s the average growth rate of Korean firms was significantly higher than that of U.S. firms. On the other hand, profitability and firm value of U.S. firms were higher than those of Korea in all periods but the gap showed a decreasing tendency. According to the presenter, these results showed that firms of Korea had been gradually changing their former tendency to pursue growth at the expense of profitability. Other performance indicators like sales growth rate, return on assets, return on sales, and Tobin's Q were individually regressed on the independent variables mentioned before to derive the different effects of these explanatory variables. In these regressions, R&D intensity and advertisement intensity variables were more effective to firms in Korea than in U.S. In addition, investment of Korean firms had significantly smaller effect than that of U.S. firms. According to the presenters, this could be linked to the differences like overall management capabilities or investment climates, and connected investment with performance. Thus, this study showed that factors of firm's performance can have different impacts on firms in different countries.

**Suraksha Gupta** presented a paper on "Exploring Relationship between Competiveness and Marketing Innovation: A Resource Based view of International brands in Emerging Markets". She conceptualized a model of marketing via virtue of competitiveness. In the recent global crisis, manufactures from established markets have faced downturn in their business and are looking towards outside territories especially emerging economies for establishing their business and activating higher growth. But international firms while operating outside their home country face many problems like difference in culture, competition in the emerging market and serving customers spread widely in the geographical territory, out of which the first issue is the most challenging to be addressed. In this context, she advocated a resource-based model where international and local firms by collaborating in business via sharing each others' resources can build their individual competitiveness and innovatively serve the market. Business relationship with local firms proves an important resource for international firms to collect local knowledge of market and understand specific cultural requirements of customers in an unknown market. On the other hand, foreign

firms provide important resource to the local firms by offering their brand value and marketing facilities which helps local firms to maintain their competitiveness and also overcome the entrepreneurial challenges they face. Both local and international firms by using each other's resources competitively serve the consumers by innovatively marketing the product which is based on the local culture, thus, adding extra value to the product. The presenter summarized that international firms in association with the local firms succeed in creating brand value which caters to local needs, thus, helping international firms to become competitive manufacturer as well as local firms to become competitive seller of the product.

The session saw discussions regarding marketing strategies adopted by foreign firms, and FDI in retail in India.

#### **Technical Sessions Va and Vb**

The fifth technical session was held as two parallel sessions.

In one session (Va) which was chaired by **Prof. R.S. Sidhu** from PAU, Ludhiana, in which three papers were presented.

**Dr. Sukhpal Singh** presented a paper "Institutional Innovation for Agricultural Development in India: Experience and Prospects". He highlighted the importance of institutional innovations in Indian agricultural framework which is dominated by large number of small farmers who face many problems like high transaction-cost, lack of market integration and interlocking of factors and output markets. The institutional innovations have come up in a big way to help small farmers overcome these problems by way of reducing transaction cost, managing risk, organizing them effectively and addressing their marketing problems. Prof. Sukhpal examined institutional innovations – both group and policy – in agri-business sector where these have helped small farmers in almost every possible way like providing farm inputs, processing their produce, marketing it and helping them to fetch attractive prices. He exemplified success stories of institutional innovations both in India and abroad. Some of the examples included MAHAGRAPES in Maharashtra helping grape growers to export their grapes, turmeric cooperative FAPFO in Hoshiarpur district of Punjab providing farmers enormous benefits of this high value added crop, Kohinoor Food Ltd. (KFL) in Utrakhand promoting organic Basmati rice and quality tea procurement centres in South India formed by SHGs of women. Apart

from it, producer companies (PC) have come up via amendment of Companies Act, 1956 to overcome problems of traditional cooperatives. These producer companies were first promoted in Maharashtra State. Some institutional innovations like Newly Generated Companies (NGC) have come up in USA and Canada. These aforementioned institutional innovations have strengthened small farmers in terms of linking them to market, organizing them effectively, providing them better return of their produce and making them internationally competitive. But APMC markets is still the biggest existing platform for large number of small farmers which needs to improve its cost effectively to help farmers in providing better share of their produce.

The second paper by **A. Sajitha** entitled "Institutional Innovations and Black Pepper Cultivation in Kerala: An Exploration" attempted to explore the impact of innovation at farm level on black pepper in the state. In agrarian economies like India in general and Kerala in particular, agriculture holds an important role in the process of economic development. Black pepper is one of the most traditional spice crops of India which has been produced and traded worldwide. However, with the emergence of competition from other pepper producing countries such as Vietnam, Brazil, Indonesia and Sri Lanka, India is missing out the opportunity to take advantage of the fast-growing international pepper market. A sustainable and dynamic approach towards the development of this sector becomes a major concern of government and the policy makers. The paper suggested that institutional intervention and better coordination among various agencies to provide the extension services and timely support pepper growers can go a long way in boosting the cultivation of pepper.

The third paper presented in this session was by **G.K. Rajesh** entitled "Diffusion of Agricultural Innovations in India: The Case of Bivoltine Hybrid Technology in South Indian Sericulture'. He discussed the difficulties encountered by the Indian silk industry. Due to low productivity, poor quality produce and resulting imports of silk, domestic sericulture has been adversely affected and led to considerable labour displacement. Adoption of Bivoltine hybrid silkworm has been provided as an answer to this problem, but again, bivoltine technology diffusion has been very slow in India. In this context, Rajesh took up an empirical study in the sericulture belt of Mandya district of Karnataka (India) and attempted to look into the factors determining the diffusion of bivoltine hybrid silkworm in India. The study

found that age, education and availability of family labour discouraged bivoltine adoption, while farm size, credit, mitigation of perceived risk and uncertainty exert a positive influence. The study stressed the necessity for evolving more hybrids resistant to diseases, crop insurance schemes, improvement in the official extension system by capacity building and credit facilities on affordable collateral for sericulturists.

The parallel session Vb was chaired by **Dr. Rajeshwari Raina**. Two papers were presented in this session. The first was by **Pratap C. Mohanty**. He presented a paper entitled “**Determinants of ICT Diffusion and Implications for Policy in India: Theory and Empirical Estimation Based on Unit Level Data**”. He highlighted the importance and potential of Information and Communication Technology (ICT) in transforming the economy especially the rural economy. According to him, lack of infrastructure and accessibility associated with the use of ICT creates additional hindrance for the poor to catch up and fail to take the benefit of ICT applications. The analysis was conducted using Rank/Probit Regression model approach and has tried to examine critically the mapping of ICT diffusion especially to highlight the persisting gap of ICT use among rural and urban areas. The results of probit regression and marginal effect after probit have indicated that caste, size of the household, occupation, education, value of asset holding, monthly per capita expenditure (MPCE) on internet, local content, marriage and location of the household in rural or urban very significantly affected the use of computer and broadband service. Other factors like place and inherent network effect, sex, education, local content, age (young age), occupation and caste also had a dominant affect on ICT diffusion. Thus the gap between rural and urban has widened. It was suggested that firstly, a major effort should be made to transform the local spoken and written languages into universally used set of computer codes, fonts, and so on. Secondly, there is a need for operating systems and for useful software applications that are relevant to and that speak to the needs of the local people. Monhanty thus concluded by saying that there is no skepticism to the fact that the wealth created by a successful software industry could be shared by other sectors of the population, but so-called ‘market forces’ are not adequate to ensure this outcome. Instead, required are government policies, actions, and plans, along with the dedication of individuals, real

stakeholders and enterprises that benefit from the IT boom, to make sure the wealth created through various channels could aid those who live ordinary lives.

Another paper was presented by **Sandeep Kumar Kujur** was entitled "Determinants of ICT Diffusion and Implications for Policy in India: Theory and Empirical Estimation Based on Unit Level Data". He highlighted the importance and potential of Information and Communication Technology (ICT) in transforming the economy especially the rural economy. According to him, lack of infrastructure and accessibility associated with the use of ICT creates additional hindrance for the poor to catch up and fail to take the benefit of ICT applications. The analysis was conducted using Rank/Probit Regression model approach and has tried to examine critically the mapping of ICT diffusion especially to highlight the persisting gap of ICT use among rural and urban areas. The results of probit regression and marginal effect after probit indicated that caste, size of the household, occupation, education, value of asset holding, monthly per capita expenditure (MPCE) on internet, local content, marriage and location of the household in rural or urban areas significantly affected the use of computer and broadband service. Other factors like place and inherent network effect, sex, education, local content, age (young age), occupation and caste also had a dominant affect on ICT diffusion. Thus the gap between rural and urban has widened. It was suggested that firstly, a major effort should be made to transform the local spoken and written languages into universally used set of computer codes, fonts, and so on. Secondly, there is a need for operating systems and for useful software applications that are relevant to and that address the needs of the local people. Mohanty concluded by saying that there is no skepticism to the fact that the wealth created by a successful software industry could be shared by other sectors of the population, but so-called 'market forces' are not adequate to ensure this outcome. Government policies, actions, and plans, along with the dedication of individuals, real stakeholders and enterprises that benefit from the IT boom are needed to make sure that the wealth created through various channels could aid those who live ordinary lives.

### **Special Lecture III (Keun Lee)**

Prof. Keun Lee from Seoul National University, South Korea, delivered a special lecture on 'Knowledge and Detour for Sustained Catch-up beyond the Middle

Income Trap: Neo-Schumpeterian Analysis at Firm, Sector and Country Levels'. The lecture was chaired by **Prof. B.K. Pattnaik**.

Prof. Lee first traced the trend of catch up in countries like Korea, Taiwan, Malaysia during the 1960s, 70s, 80s and the 90s. His lecture focused on questions like what determines catch up growth, why it is easy to catch up in some sectors and not in others, and which corporate innovation system is a good fit for catching up. He took cycle time (speed of change in knowledge base of technology) as the key variable, and emphasized that to catch up, it is better to specialize in short cycle technology based sectors because knowledge becomes quickly obsolete. Prof. Lee pointed out that shorter cycle was leading to growth in Asian countries. Catching up firms tend to pursue sales growth by borrowing and investing more, while advanced firms pursue profitability. Prof. Lee cited the example of Korea and Taiwan, who have increased the level of self production by specializing in short cycle technologies. However, he admitted that the cycle time of Korea and Taiwan patents have been growing longer in recent times.

Prof. Lee concluded by advocating detour for latecomer countries. He mentioned three steps along the detour – design capabilities, targeting short cycle sectors, and leapfrogging into new/emerging technologies in short cycle.

The lecture was followed by questions being raised regarding lessons to be learnt for India, the need for good governance in catch up, and the possibility of carrying out our own path of development instead of catching up.

#### **18.11.2012 : Technical Session VI**

The sixth and last technical session was held on the third day of the conference. The session was **chaired by Prof. Sukhpal Singh** from IIM, Ahmedabad. Three papers were presented.

The first paper presented by **Pradeep K. Choudhury** entitled "Technical Education and Labour Market: An Empirical Study of Engineering Graduates in Delhi", analyzed the labour market profile of final year engineering graduates in Delhi, taking a sample of 1178 students in the academic year 2008-09. He took six dimensions like the percentage of students getting job offers, waiting period, type of job, location of job, type of company, annual salary, household characteristics, etc. to analyze the labour market profile. Logit model was then applied to determine the

employability of engineering graduates. His analysis emphasized the role of management of the institutions and courses of study on different labour market aspects of engineering education in Delhi.

Another paper was presented by **Ranjan Kumar Mohanty** entitled "Fiscal Deficit-Economic Growth Nexus in India: A Co-integration analysis". He studied the impact of fiscal deficit on the economic growth of India. The objective was to examine both the short run and long run relationship between the two by covering the time period from 1970-71 to 2011-12. The objectives of the study were examined using Unit root test (ADF and PP test), Johansen Co-integration test, Granger Causality test, and Vector Error correction Model (VECM) technique. Johansen methodology confirmed the existence of long run relationship between GDP and selected factors namely; fiscal deficit held by the central government, gross domestic capital formation and employment in the public and organized private sectors. The findings indicated a negative and significant relationship between fiscal deficit and economic growth in the long run. The findings also revealed that the negative impact of post reform fiscal deficit on economic growth was more than the impact of pre-reform's fiscal deficit. According to Mohanty, this is contrary to Keynesian theory, but in conformity with Neo-classical theory, which holds that fiscal deficits lead to a fall in the Gross Domestic Product. Thus, he suggested that the subsidies should be reduced and instead this money should be invested in health, education and infrastructure sectors such as power and roads etc., so that it enhances the productivity of both human and physical capital, which will go a long way in increasing the per capita income of the people.

The last paper was by **Anirudha Barik** entitled "Government debt and Economic Growth in India". It examines the potential indirect influence of public debt on economic growth through its impact on investment. The issue is empirically examined using an augmented Solow (1956) neoclassical model of economic growth that allows for both the direct and indirect effects of public debt on economic growth. Barik concluded that public debt appears to be positively related to both investment and output growth and thus has an indirect positive effect on economic growth through its positive influence on investment.

### **Valedictory Session**

In the valedictory session, the valedictory address was delivered by **Prof. K.J. Joseph** from CDS, Thiruvanthapuram. The address was entitled "Innovation and Development in India: Changing Paradigms and Trajectories". Prof. Joseph highlighted the importance of science, technology and innovations for the development of the economy and also tried to capture the major shifts which have occurred in the technological paradigms especially after liberalization.

India is one of the pioneering countries in recognizing the importance of science and innovation in its development. This is well reflected in Science policy of 1958 which highlights the importance of science and technology (S&T) for industrialization. Prof. Joseph first explored the relationship between growth, innovation and development and secondly, he touched upon the issue of transforming those economies who got independence after World War II. For analyzing the first issue, he took up six heuristics frameworks – classical legacies, Schumpeterian paradigm, Arrovian legacy and endogenous growth model and technological capability approach and innovation system approach. Examining the second issue showed a major shift from inward oriented and trade restricting policies towards outward oriented and trade promoting polices, and the success of South Korea was specially mentioned. Regarding innovation capability building in new emerging countries NIC's, the speaker dealt with two broad issues. Firstly the issue dealing with the transfer of technology either via FDI or embodied technology or through imitation, the second issue related to building local technological capabilities which are adaptive in nature.

Prof. Joseph stated that the catching up strategies for the developing countries in the present globalized world are not the same and conducive in the way as these were in the earlier policy regimes. He took up the different periods in order to capture the technological paradigm shift occurred in India – phase I before 1990 and phase II after 1990. Phase I is characterized by policies focusing on achieving self-reliance in science and technology. Science Policy Resolution of 1958, Science and Technology Plan (1969-74) and Technology Policy Statement of 1983 highlights efforts to develop indigenous technology and building technological capabilities. SUSSEX manifesto, though not improved by UN council was immensely helpful in increasing

R&D efforts of developing countries especially India. Various restrictions on foreign collaborations were imposed and FDI was allowed only in the core areas. However, the paradigm after shift 1990 was marked by increasing integration with the rest of the world in order to build technological capabilities and become internationally competitive. New Patent Act of 2005, New Science and Technology policy of 2003 emphasized developing S&T for higher and sustainable economic growth.

But the need of the hour as highlighted by Prof. Joseph is to develop NIS framework in the southern perspective where inclusive innovations assumes significant importance. In the developing countries, there is higher economic growth on the one hand and rising inequalities and poverty on the other. So, the policy makers should develop NIS framework in a way which must address the problems of the marginalized and excluded sections of the society. In this decade of innovation, efforts must be geared towards generating such NIS framework which provides inclusive innovations for inclusive growth of the society.

Prof. Joseph viewed innovation as a cheque given by society to the poor, but considered it unfortunate that this 'cheque' has bounced because of our inability to understand institutional constraints. However, he was optimistic that not all has been lost.

The conference drew to an end with this address.

Rapporteurs:

Prof. Anita Gill  
Dr. Harpreet Kaur  
Ms. Deepika  
Ms. Niharika