UNDERSTANDING INNOVATION

THE INDIAN CONTEXT

A Bulletin Initiated by

National Science and Technology Management Information System (NSTMIS), Department of Science and Technology, New Delhi, Govt.of India

सत्यमेव जयते

ISSN 2277 - 9299

CSIR-National Institute of Science, Technology and Development Studies (NISTADS),New Delhi

Understanding Innovation

The Indian Context

Contents

Editors

Pradosh Nath

Parveen Arora

Research & Editorial Team

Abhinandan Saikia

Abhishek Kumar

Praveen Rawat

Debanjana Dey

Technical Support Roshan Kumar & Sanjay Kumar

Cover Design Debasish Mukherjee

Field Survey Conducted by

Market Insight Consultants
A 72, Sector 34
NOIDA 201307 (U. P), India
www.marketinsightconsultants.com

Zinnov Management Consulting Pvt. Ltd.
69, Pratibha Complex
4th ‘A’ Cross Koramangala Ind. Layout
Koramangala 4th Block, Bangalore - 560095
www.zinnov.com

डा. टी रामासामी
सचिव
DR. T. RAMASAMI
SECRETARY

भारत सरकार
विज्ञान और प्रौद्योगिकी मंत्रालय
विज्ञान और प्रौद्योगिकी विभाग
टेक्नोलॉजी भवन, नया महरौली मार्ग, नई दिल्ली- 110016
GOVERNMENT OF INDIA
MINISTRY OF SCIENCE & TECHNOLOGY
DEPARTMENT OF SCIENCE & TECHNOLOGY
Technology Bhavan, New Mehrauli Road, New Delhi-110016

FOREWORD

Recognizing the importance of innovation for economic and social development, the Government has declared 2010-2020 as the **decade of innovation.** A new policy on Science, Technology and Innovation is also on the anvil. To align with the changing paradigm, the Department of Science and Technology (DST) has launched a new initiative the Science, Technology, Innovation and Creation of Knowledge (**STICK**). STICK aims at developing innovation indicators in Indian context and benchmarking the performance of the national innovation system. This highlights the significance of National Innovation Surveys (NIS) in measuring innovation for better understanding and enables evidence-based policy interventions for innovation led growth.

The National Innovation Survey framework, evolved upon in-depth discussion with the national and international experts, shall be used in the implementation of the STICK Programme. The present bulletin, first in the series, has been planned to disseminate the intermediate findings of the ongoing NIS.

The bulletin elaborates the fundamental issues related to innovation survey and context specificity, a comparative understanding of similar surveys including their methodology undertaken in other countries, and the progress of NIS made so far in Indian context.

A commendable effort has been made by the DST and NISTADS team to put together fundamental issues related to innovations in the context of developing economies to make the bulletin useful to policy makers, planners and the scientific community. Subsequent issues of the bulletin will report on the interim results of the survey as a prelude to the final report.

Dr. T. Ramasami
Secretary

New Delhi
October, 2011

1 About the Bulletin

The President of India has declared the present decade as the Decade of Innovation. National Innovation Council has been constituted to herald the activities for promotion of innovation. On its part Department of Science and Technology (DST), Government of India has launched STICK (Science, Technology, Innovation and Creation of Knowledge) programme. The National Innovation Survey (NIS) is a major programme under STICK initiative (see section 2 of the Bulletin for details).

The bulletin is the first of the series planned to be brought out for interim dissemination of the broad findings from the survey data. The present edition of the bulletin sets a few fundamental issues related to the survey. Context specificity of innovation and its implication on the basis of the survey is briefly discussed in section 3. Section 4 presents a comparative understanding of similar surveys undertaken in other countries. This section reports on the questionnaires adopted by selected countries and also results derived from the respective surveys. Section 5 of the Bulletin elaborates the survey methodology, population and sampling. The last section reports the progress of the survey.

DECADE OF INNOVATION

President of India in her address to Parliament on 4th June 2009 mentioned that next ten years would be dedicated as a Decade of Innovation. Prime Minister of India in the 97th Session of Indian Science Congress held on 3rd January, 2010 at Thiruvananthapuram, Kerala also mentioned in his speech that the Government has declared 2010-2020 as the "Decade of Innovations". The main aim of this declaration is to *develop an innovation eco-system in the country* to stimulate innovations and to produce solutions for the societal needs in terms of healthcare, energy, urban infrastructure, water and transportation.

Courtesy: www.parliamentofindia.gov.in

NATIONAL INNOVATION COUNCIL

The National Innovation Council has been constituted under Shri Sam Pitroda, Adviser to PM on Public Information Infrastructure and Innovations.

The Council will prepare a Roadmap for the Decade of Innovation 2010-2020. The various tasks assigned to the Council are as follows:

i. Evolving an Indian model of innovation, with focus on inclusive growth;
ii. Delineating policy initiatives within the Government, required to spur innovation;
iii. Developing and championing innovation attitudes a nd approaches;
iv. Creating appropriate eco-systems and environment to foster inclusive innovation;
v. Exploring new strategies and alternatives for innovations and collaborations;
vi. Identifying ways and means to scale and sustain innovations;
vii. Encouraging Central and State Governments to innovate;
viii. Encouraging universities and R&D institutions to innovate;
ix. Facilitating innovations by SMEs;
x. Encouraging all important sectors of the economy to innovate;
xi. Encouraging innovation in public service delivery; and
xii. Encouraging multi-disciplinary and globally competitive approaches for innovations.

Apart from these tasks, the Council shall also promote the setting up of State and Sector Innovation Councils to help implement strategies for Innovation in States and for specific sectors. The Office to the Advisor to the Prime Minister on Public Information Infrastructure and Innovations will serve as the Secretariat for the National innovation Council and will be responsible for all administrative and operational work.

Courtesy: www.parliamentofindia.gov.in

2 Measuring Innovation: National Innovation Survey for India

S&T driven innovation and knowledge are the key drivers of growth in the 21st Century. Recognizing this, Government has declared 2010-2020 as the **decade of innovation** and a new policy focusing on Science, Technology and Innovation is also on the anvil.

Innovation is widely accepted as a complex process having feedback mechanism and involves interactive relations among science, technology, learning, production, institutions, organizations, policy and market.

The traditional S&T indicators used in the assessment and planning of national scientific resources have limitations in capturing the multidimensional innovation process. Many industrialized countries and of late, some of the developing countries have started Innovation Surveys to develop a set of indicators reflecting their national specificities. The **STICK** programme addresses this gap and aims at developing innovation indicators in Indian context.

STICK Initiative

To align with the changing paradigm on innovation the National Science and Technology Management Information System (NSTMIS), Department of Science & Technology has evolved a new initiative named **'Science, Technology, Innovation and Creation of Knowledge (STICK)'**.

The **STICK** aimed at a) developing indicators to understand the dynamics of innovation and knowledge creation activities and its relation with the economic growth and b) benchmarking the performance of the national innovation system.

STICK shall lead to policy interventions, development of appropriate incentive structures including cross cultural comparisons for efficient planning, and fostering the innovation eco-system in India.

National Framework

Over the last few years **NSTMIS** had involved various stakeholders in evolving an appropriate framework to measure the innovation and knowledge creation capabilities in Indian context. The NSTMIS framework draws upon the inputs of the pilot innovation survey, sectoral innovation studies (see Chapter 7 – Some reflections from the pilot study), interactions with the national and international experts while adapting the internationally accepted concepts and definitions on the measurement of innovation.

The STICK envisages measuring innovation and knowledge creation capabilities in terms of product and process innovation, organizational and marketing innovation apart from the new knowledge generation to develop innovation indicators as per the conceptual model (see Fig.1). Based on the various innovation indicators, a STICK Score Card shall be formulated to judge the innovativeness of the various sectors/ regions of the national innovation system.

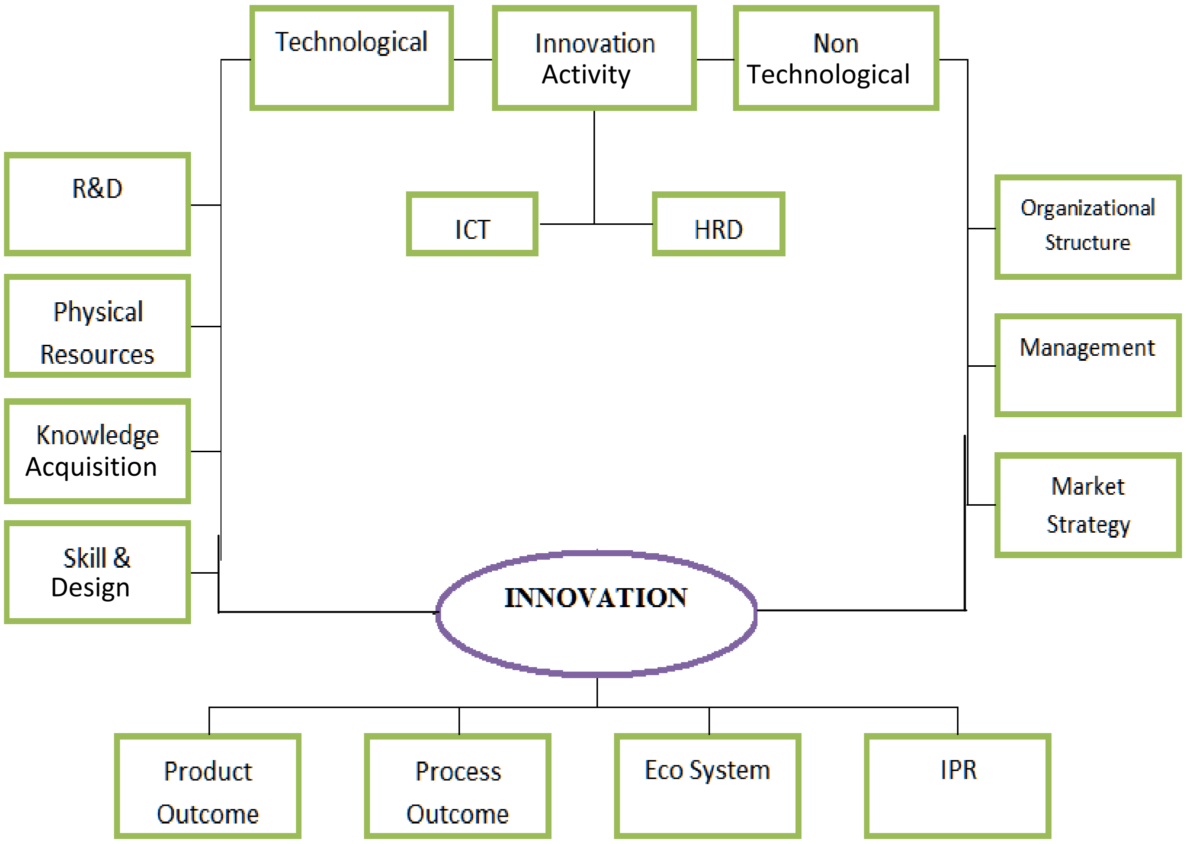
Based on the graphical view of innovation (see Figure 1) we identify following areas of institutional intervention that can help promote innovations. The identified areas are:

1. Technology Generation: Mainly the R&D organizations as source of new knowledge;

2. Technology diffusion/ Marketing: Organisations responsible for marketing on shelf technologies;

3. Technology Consultancy: Organisations providing consultancy services related to choice of technology, new technology and also technology upgradation;

Figure 1: Schematic view of innovation



4. Tools, equipment, prototype development: Organisations imparting skill, R&D and also designing capabilities;

5. Common facilities/ testing centres: Organisations providing facilities for testing, standards, calibration etc;

6. Raw material, machine and equipment supply: particularly important for SMEs and also for a few strategic industries arrangements for supply of raw material is an essential support for innovation. Like raw material, access to required machine and equipment is a critical issue for innovation;

7. Finance, refinance, venture capital: Since innovation bears certain degree of risk, financing, risk financing and refinancing are important support system for innovation;

8. Infrastructure development: Basic infrastructure facilities are the most important support system for innovation;

9. Training and skill development: This helps innovation in two ways – skilled manpower is the pre-requisite for any enterprise on the innovation path; again skilled manpower themselves can bring in new innovations;

10. Entrepreneurship development: Innovation is about enterprises. In a modern world of business and industries an enterprise has to face

complex issues related to management. Entrepreneurship development programme are for making budding entrepreneurs confident in assessing the business environment and accessing various facilities and opportunities for making new innovation successful;

The STICK initially concentrates on surveying innovation activities in the industrial sector, which would later be scaled up to the basket of sectors namely public and private research institutions, tiny and unorganized sector including the grass root innovations.

As a part of the framework, the national innovation survey would target a population of more than 2 lakhs enterprises in various industrial sectors spread across 26 States & 6 Union Territories in the country through a statistically valid sampling design. Information on various aspects of innovation would be elicited through a structured questionnaire from the enterprises through personal visits, website including postal and telephonic response etc.

Deliverables

The STICK Programme shall deliver the following:

- National Innovation Indicators Report
- Sectoral, Regional and Industrial Innovation Indicators Reports
- Special Bulletins.

SCHEMES PROMOTING INNOVATION: under MINISTRY OF SCIENCE & TECHNOLOGY, GOVT. of INDIA

a. Technopreneur Promotion Programme (TePP);

b. Technology business incubators under Science and Technology Entrepreneurship Development scheme;

c. Drugs and Pharmaceuticals Research;

d. Innovation Clusters;

e. Small Business Innovative Research Initiative (SBIRI);

f. Biotechnology Industrial Partnership Programme (BIPP);

g. Open source drug discovery (OSDD) projects; and

h. Grass root innovations through National Innovation Foundation.

Courtesy: www.parliamentofindia.gov.in

3 Innovation in Indian context: Conceptual Issues

Is there an Indian context of innovation? Or, in other words, is there country/economy/society specificity of innovation? The answer is affirmative in the concept of National Innovation System (NIS) but in a very restricted sense. The concept of NIS is based on arrangement of innovation and the interactive role of various actors in the arrangements. The 'Context specificity' that we would like to emphasize on, is wider by added economic dimensions. It is to be noted that market does not have any overt role to play or very limited role to play in the conceptual framework of NIS. In a developed economy, where both product and factor markets are sufficiently developed and financial market has a long history of spearheading economic development, market is ubiquitous in all economic activities and process of decision-making. A developing economy on the other hand would be understood in terms of weak market forces and inadequate development of market. This has its implications also on dynamics of innovations. Market, being ubiquitous, is taken for granted in the developed economies, and therefore, does not show any overt presence in the discussion on innovation. It is market dynamics that make enterprises in the developed economies innovative; - innovation as the survival guide for developing competitive advantage in a market economy environment. It is the demand aspect that leads to creation of NIS, and also makes it effective. The main issue, therefore, is to build up an efficient innovation system that can fully utilize the demand side dynamics.

On the contrary, in developing economies role of market is conspicuous by its absence or inadequate presence. Innovations by the enterprises in the developing economies are not responses to the market signals; they are more for the balance between labour and leisure, as it is in the primitive capital formation/accumulation. As a result these innovations are not for the market, and not put for commercial transactions; and as such not recognized as innovation either by the innovator or by the market. The weak market forces also work as disincentive to innovation because realization of benefits to the enterprises remains uncertain. In such a condition the NIS may be designed following the same in a developed economy, but in the absence of demand side dynamics, NIS witness restricted effectiveness and in the long run becomes non-functional. The above understanding of innovation has far reaching implications on innovation studies. The basic difference is that the word 'innovation' would carry a meaning for the enterprises in the developed economies; but may not carry the same meaning for enterprises in the developing and less developed economies. In a survey, like the one this Bulletin is to report about, asking the enterprise whether they are innovative would elicit prompt response (positive or negative) from enterprises in the European economies, but might receive only amorphous response from most of the Indian enterprises, particularly in the small and medium enterprises in the manufacturing segment. In the following section we have presented the broad results derived from some of the well-known innovation surveys. It is to be noted that all the surveys have reported on, to begin with, percentage of innovative firms identified from the sample of the firms surveyed. This information was generated from enterprises by asking direct questions on innovations done and undertaken. Developing economies or less developed economies characterized by little innovative activities have to be understood not in terms of percentage of innovative firms but by understanding the process of innovation and supports needed for activating the process.

In the absence of the same dynamics the question for developing economies is if innovation can be induced through any other arrangements or incentives. Experiences from Japan and Korea suggest that a determined state initiatives nurturing selected sectors and associated science, technology and human resources for directed and targeted development through innovations. This was similar to wartime S&T and R&D policies of USA credited to Vannevar Bush, who, however, went on to propose an all together different and more liberal S&T policies for post-war peace period. In cases of both Japan and Korea the onus of industrial innovations remained with the enterprises, which have been directed, facilitated and sometimes goaded by the state essentially to complement the absence or inadequate presence of market forces.

In the context of developing economies understanding of innovations has to focus on the existing weak-links of networks among technology generation system (inside and outside the enterprise) technology user system and the capacity of the economy to capitalize on the innovation through production system and financial system within an overarching market structure. It also has to focus on innovations outside the organized segment of the economy to touch the million lives in the unorganized sector. In short unlike developed economies, a developing economy with large population like India would also need an arrangement for innovation that is inclusive by design. In the one hand the government's arms for promotion of innovation has to be extended far beyond the organized segment of the economy, on the other hand market forces have to be strengthened so that tiny and small enterprises in the remote and rural areas can capitalize the new innovations from the market place.

The present survey in a limited way tries to accommodate the context specificity within the broad framework of innovation surveys in other countries. More than innovations (as a distinguishable piece of knowledge in use in the production or/and services) focus is drawn on firms' activities that can facilitate innovations. Issues like 'organisational innovation' and 'market innovation' or 'human resource creation' have been emphasized in the survey. In short the survey aims to capture information on a firm's endeavour to create firm specific advantages over others in the industry. The survey also explores the extent of interactions with the organized institutional arrangements for promotion of innovations in one side and the market forces on the other side.

C.F. Carter and B.R. Williams of Great Britain pioneered the worldwide survey of innovation in late 1950s for advancement of science.

4 Innovation Survey: A Brief History and Cross-Country Comparison of Studies in Other Countries

An international survey on Research and Development was conducted in 1963. The Survey was based on a guideline, popularly known as Frascati Manual (see Box 1). This was the beginning of standardization of innovation survey aimed at international comparison. In 1992 the OECD adopted a new guideline (Oslo Manual, Box 2), which was used for the first innovation survey in 1993 in 12 European countries.

Box 1: Frascati Manual

Frascati manual is the first official version of the Proposed Standard Practice for Surveys of Research and Development developed by OECD and national experts on research and development statistics in June 1963.

The salient features of the manual are,

- It sets standardized methodology for collecting statistics about research and development and interpretation of established R&D data.
- It sets forth basic definitions for basic research, applied research and Research and Development.
- It also deals with measuring the resources devoted to R&D – expenditure and personnel – in the performing sectors.

The survey used Indicators for measuring the products, processes and services as outcome of innovation activities undertaken by firms considered as the engines of technological change. The context of less developed economies necessitated changes in the indicators and also changes in the understanding of the sources of innovations and accommodated social context/local capabilities (Bogota Manual, see box 3) of individuals and communities outside and independent of firms.

Box 2: Oslo Manual

The first version of the Oslo Manual was issued in 1992 by the Organization for Economic Co-Operation and Development as a document "The Measurement of Scientific and Technological Activities, Proposed Guidelines for Collecting and Interpreting Technological Innovation Data". It contains guidelines for collecting and using data on industrial innovation.

The salient features of the manual are,

- the manual covers innovation in the business enterprise sector only;
- it deals with innovation at the level of the firm;
- it concentrates on technological product and process (TPP) innovation, with optional guidelines for other forms such as organizational change;
- it covers diffusion up to "new to the firm".

In recent years the focus has further changed from 'objective' measure of innovation to capture the incipient capability accumulation in an evolutionary context. Innovation, therefore, is studied as a process and as a part of the whole process of technological learning and utilization of knowledge. The third revision of the Oslo Manual (OECD and Eurostat, 2005) included marketing and organizational innovations as important components of innovation survey.

Given the importance of innovation in globalized world and need for appropriate policies for inducing innovation, different countries, both from developed as well as developing economies, have carried out the innovation survey in the recent past. Most of these countries modified the focus of the survey to accommodate specific local issues and conditions. A comparative table in this regard highlights some of the salient features, uniqueness and emphases adopted by selected countries (see Table 1).

Table 1 presents a comparative assessment of the emphases of the surveys through questionnaire adopted by different countries. We have taken the categories from the questionnaire adopted by us and compared the coverage by other surveys, namely, EU, Canada, Malaysia, Colombia and South Africa. We have compared the number of subcategories in a broad category covered by other countries. Also we have indicated the number of unique subcategory in Indian survey and surveys done by other countries. First column of the table shows different sections of NIS questionnaire and the total number of questions present in the sections. Next 5 columns represent the given countries/community having number of questions similar to NIS. Other columns highlight the uniqueness of NIS and other countries' questionnaire along with similar questions with differences in their domain. Some broad issues asked in the questionnaire of the given countries are:

- Collaboration and cooperation in Innovation, which were asked in NIS questionnaire but in different form, though explorable enough to answer the question of collaboration and cooperation.

- Again government assistance for innovation is divided under various heads in questionnaire of given countries, which are not asked explicitly in NIS questionnaire.

A complete different sub-section which is there in other's questionnaire is about Innovation Management Tools which is missing in NIS questionnaire, but this question has a very little relevance in Indian context.

Table 2 presents a comparative picture of the results derived by different countries from the innovation surveys.

Box 3: Bogota Manual

Latin American researchers were the first to table a systematic discussion on the contextualization of traditional innovation indicators in this Manual (RICYT et.al. 2001), held in Bogota in 1997 and 2000.

The manual listed broader definition of innovation, which includes not only R&D efforts, but also efforts regarding "design, installation of new machinery, industrial engineering, acquisition of embodied and disembodied technology, organizational modernization and marketing"

According to the manual the Latin American indicators should measure the following,

- The Concept of Technological Capabilities.
- Innovation as a social and interactive process.
- External Sources and Endogenous Technological Effort.
- Organizational Innovations.
- Training.
- Quality management, environmental management and innovation capabilities.

There are two specific results derived from such surveys. First is regarding the status of innovation. In this, an understanding on firms' emphasis on innovation activities, nature of innovations (product and proves of innovations) and impact of innovations on the firm in terms of turn over etc. is arrived at. The second set of results is related to impediments to innovation captured in terms of availability of fund, sources of information etc. Both sets of results have important policy implications. The status of innovation at firm level indicates the volume of thrust needed for promoting innovation, where as the impediments to innovation indicate the specific areas that need attention for policy induced corrective measures.

Table 1: Comparative emphasis in the questionnaires

Particulars of NIS Questionnaire	European Community Innovation Survey	Canada	Malaysia	Colombia	South Africa	Unique Question/s in NIS	Unique Question/s in Other's questionnaire	Similar Question with Different Domain	Remarks
General Information (Total 13)	**7**	**5**	**7**	**9**	**6**	• Geographic Export Markets	• Value of Imports, Investment and Productive Assets	• Changes in Production Facilities and Installed Capacity • Though, Questions on Competitive Environment in other's questionnaire is unique in this section but similar question is asked in NIS regarding Status of the enterprise in different section	
Innovation Activities and Human Resources (Total 10)	**2**	**4**	**2**	**4**	**2**	• External sources of technology & funding • Innovation new to firm or market • Orientation of training (avg/ year) • Sources of funds for training	• Employees by level of education • Cooperation and Alliance in R&D • How IPRs are Protected & rating of protection type • Whether firms do Technology transfer to Others	• The question whether Innovations were developed by internal source of external source is similar to the question of cooperation and alliance in R&D of other's	• In other's questionnaire this Section is bifurcated into 3 parts, one part belongs to first section and the other two to the second section
Information Sources and Innovation Activities (Total 11)	**10**	**10**	**10**	**10**	**10**	• Other Sources like Professional and Industry Associations			• Various information sources of innovation were clubbed into 4 sub-parts in other's questionnaire
Effects (Outcomes) of Innovation	**0**	**1**	**0**	**1**	**1**				• In NIS questionnaire this question has 12 different options, which is clubbed under one head in the other's questionnaire • And Quantitative impact which is there in other's

Particulars of NIS Questionnaire	European Community Innovation Survey	Canada	Malaysia	Colombia	South Africa	Unique Question/s in NIS	Unique Question/s in Other's questionnaire	Similar Question with Different Domain	Remarks
									questionnaire is asked in 2nd section of NIS questionnaire
Factors Influencing Innovation Activities (Total 19)	**9**	**7**	**10**	**0**	**9**	• Status of enterprise vis-à-vis others in the industry • 7 unique factors are provided as possible barriers to innovation in NIS questionnaire	• One factor as obstacle to Innovation is recent recession • Market Introduction time as an obstacle to innovation	• Questionnaire of given countries factors out economic risks which says cost-benefit analysis shows doubtful results where as NIS questionnaire directly gives a factor as availability of finance within enterprises as broader term	• Some questions are asked in terms of numbers in the given countries' questionnaire which is not in same pattern in NIS • In NIS questionnaire broad numbers of factors influencing innovation activities are mentioned which are less detailed in others' questionnaire.
Wider Innovation (Total 4)	**0**	**1**	**1**	**2**	**1**				• Questions related to IPR of the firms, ICT infrastructure & its usage level, marketing and organizational innovation were asked in this section in NIS questionnaire. Though some questions were asked related to above issues in the questionnaire of given countries but not in the broader sense (such as Organisational and Marketing Innovation) as in the NIS.

***Source: Compiled from various literature survey*.**

Table 2: Innovation survey in the world: Highlights from six countries' experience

Countries ⇒ Issues ⇓	South Africa	Canada	Malaysia	Colombia*	EU	
					Germany	**Netherlands**
% of innovative firms	51.7% of firms are Innovative	65% of firms were innovative	Out of 4000, only 19% responded, of which 35% indicated to be innovative.	6,670 firms out of which 6,172 firms responded of which 72% talk about innovative product	65% of firms are innovation active, 89% of large firms are innovative compared to 74% and 60% for medium and small firms.	34% of firms are engaged in innovation activities while 27% are involved in organisational innovation.
Product innovation	11.9% of firms introduced product innovation only. 51.3% of which developed mainly by enterprise themselves, and 23% were from collaboration with other enterprise or institution.	15% of Manufacturing firms introduced product innovation only. In actual 47.6% of manufacturing firms introduced product innovations.	72% of innovating companies are involved in both product and process innovation.	6% of firms introduced a product new for the national and international market, 30% introduced a product new for the national, but not for the international one, while the 40% simply imitated, by adopting a product already existing into the national market.	The share of newly introduced products amounts to 18% of the total turnover for new-to-firm products, and 8 % for new-to-market products.	8% of total turnover is contributed by new products.
Process innovation	11.9% of firms were process innovators only. 24.8% of them introduced new or significantly improved methods of manufacturing or producing goods or services.	17.4% of Manufacturing firms were process innovators only. 41.4% of them introduced new or significantly improved methods of manufacturing or producing goods or services. In actual 50% of manufacturing firms introduced process innovations.	-do-	27% introduced the new process, 10% generated the new process through R&D. The major part of process innovation is either through adoption of outside developed technology or, for a smaller part, through non-formalized research, exploiting the tacit knowledge of the internal sources.		
Funding	6.5% of innovative firms received public funding for their innovation activities	61% of innovative Manufacturing Firms got funded by at least one govt. sponsored programme	Lesser presence of government funding (4%).	Higher presence of government funding (32%).	14% of all innovative firms had access to public funds. 28% of large firms receive public funds against	38% of innovative enterprises have received public funding. 1% of total turnover is spent on

Countries ⇒ Issues ⇓	South Africa	Canada	Malaysia	Colombia*	EU	
					Germany	Netherlands
					12% of small firms.	innovation expenditure
Source of information	Internal - Almost 50% of all innovative enterprises rated sources of information within the enterprise as highly important for innovation activities. External - 35% of innovative enterprises rated Clients and customers as highly important external market source.	Internal - 45.8% of firms give R&D staff as highly important source of information (internally) External - 51.9% of firms give Clients or customers as highly important source of information (externally)	Market, Government support, R&D labs.	Internal sources, clients, public financing.	16% participation to innovation cooperation activities.	39% have participated in innovative activities.
Effect of innovation	46% of Innovative enterprises rated Improved quality of goods and services as highly important.	Meeting the requirements of existing clients was the market impact of innovation was identified by innovative manufacturing plants (57.7%) as having high importance.	Increase in market share, extension of product range.	Quality improvement, increase in the range of products/new markets/ productive capacity/ flexibility, reducing labour cost.	20% of innovative enterprises have applied for patent in 2004 and 19% of them have registered trademarks.	47% of innovative enterprises have improved the quality of their goods & services. 14% of the innovative enterprises have applied for a patent and 17 % have registered trademarks.
Factors hampering innovation	Lack of funds within their enterprise or group was chosen by majority of Innovative industrial enterprises.	Lack of funds within the plant or firm for innovation (28.7%)	High cost of innovation, lack of skilled personnel/ information on technology.	Innovation cost, lack of internal resources/external financing/human resources/information on technology/markets/ demand.		

*** All innovation surveys implemented so far in Latin America have adopted a "subject" approach where the unit of analysis is the firm and its innovation behaviour as opposed to an "objective" approach where the unit of analysis is based on innovation output in case of other countries.**

Source: Compiled from various literature survey.

5 NIS - The Present Survey in India: population and sampling

Population

For the total population we have used the Annual Survey of Industries [ASI – (2009-10)] database of the registered enterprises in the three sectors (agriculture, industry, and service) across 26 states and 6 union territories. Mizoram, Arunachal Pradesh (states) and Lakshadweep (UT) are not included in the main survey and dealt separately. Total 208415 firms (constituted of 5689 firms in the agriculture sector, 194925 in the industrial sector and 7801 firms in the service sector) were surveyed under ASI 2009-10 database. The ASI database also provides information on the size of the enterprise in terms of the labour employed.

Table 3 presents the number of states/UTs distributed across sectors on the basis of number of firms they have of various sizes. Following characteristics of the population can be derived from Table 3:

Agriculture

- In Agricultural sector, most of the states have no firms of any of the stated size.
- South Indian states and a few west and north-west Indian states have some firms in this sector. It indicates absence of organised farming in northern and eastern part of India.
- Even among the states where agricultural firms exist, only two states have big enterprises dealing with agricultural produce.
- Again there are no small firms in the agricultural sector in 21 out of 26 states, 2 states have firms ranging numbers from 1 to 50, 1 state has firms ranging from 51 to 100, 4 states have firms ranging from 101 to 500, 2 states have firms ranging from 501 to 1000 and 2 states have firms more than 1000.

Industry

- The industrial sector shows unique feature of large number of small size firms. In most of the states (22), number of firms of small labour size i.e. 0 to 99 is more than 1000.

Table 3: Distribution of Population & Labour Size over the States

Sector	Number of Firms → Firm Size (Labour) ↓	Nil	1 - 50	51 - 100	101 - 500	501 - 1000	1001 &above
Agriculture	0-99	21	2	1	4	2	2
	100-499	25	6	0	1	0	0
	500-999	31	1	0	0	0	0
	1000 and above	30	2	0	0	0	0
Industry	0-99	0	1	4	3	2	22
	100-499	0	6	3	14	5	4
	500-999	4	16	4	8	0	0
	1000 and above	6	16	3	7	0	0
Services	0-99	1	12	7	7	3	2
	100-499	9	22	1	0	0	0
	500-999	28	4	0	0	0	0
	1000 and above	28	4	0	0	0	0

Note: Each cell represents number of states with the given number of firms of a particular firm size based on employment base

Source: Constructed from ASI database 2009-10

- But when we move to firms of larger employment base i.e. 500 to 999 and 1000 & above, number of firms restricts to 1 to 50 in most states.
- In case of firms of labour size 100 to 499, number of firms ranges from 101 to 500 in 14 states. There are only 4 states where firms in this category count more than 1000.

Services

- Firms of small size are prevailing in most of the states. As we move to firms with larger employment base i.e. 500 and more, we find in most of the states there are no firms in those groups.
- In case of medium size firms of labour size 100 to 499, the number of firms ranges from 1 to 50 in 22 states. Whereas in small firms of labour size 0 to 99, 12 states have firms between 1 to 50, 7 have 51 to 100, other 7 states have 101 to 500 and 5 states have more than 500 firms.

Figure 2: Graphical presentation of the states in terms of firm size and number of firms

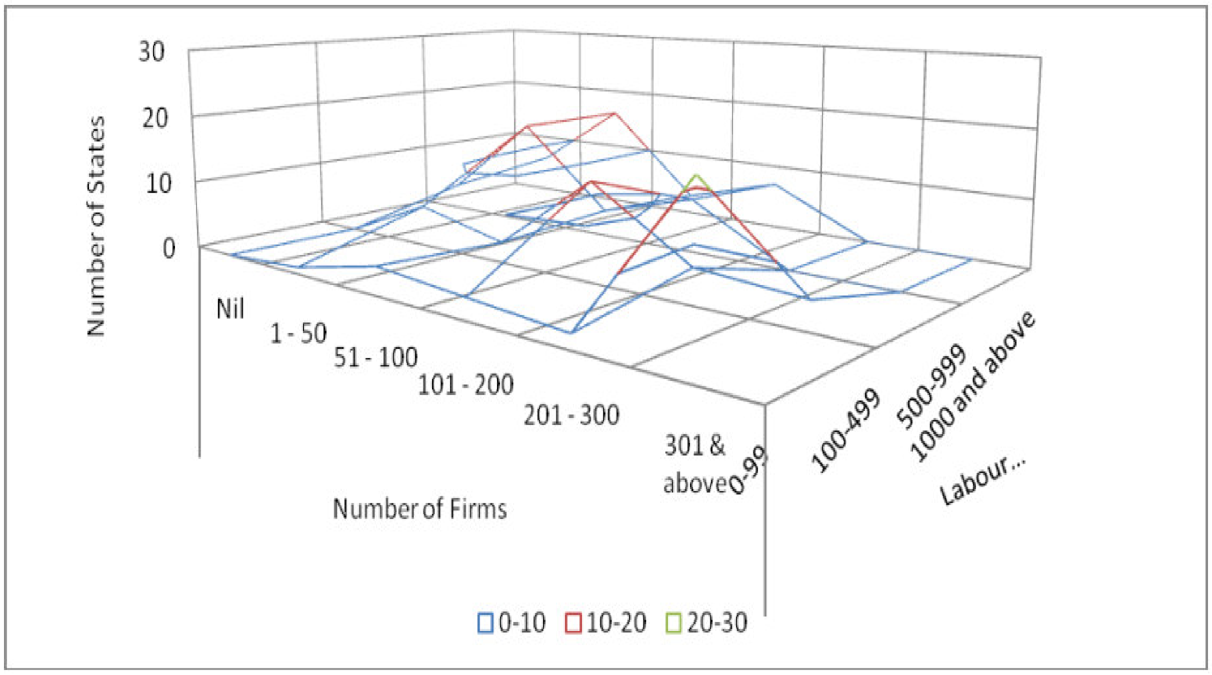


Figure 2 has horizontal axis as number of firms, vertical axis as number of states and depth axis as firm size based on number of labourers. The figure shows the number of states having different range of firms of various sizes in industrial sector in the total population

Sampling Plan

States have their own industry development policies and programmes, and also states differ in social, political and cultural practices. It is, therefore, expected that innovation dynamics also would differ across the states. The sampling plan, therefore, was to stratify the population over states. We apply sampling statistics to obtain sample size (number of enterprise to be surveyed) for each state. The ASI database has three broad sectors, namely, agriculture, industry and service sectors. The second stratification is based on the three basic sectors and their respective sub-sectors as shown separately. It is expected that the nature of innovative activities would significantly differ over the sectors. Sample size of a State is distributed proportionately across these three sectors and their sub-sectors in a State. The third level of stratification was done to accommodate the general understanding that innovation activities widely vary over the size of the enterprises. The survey has used the ASI data on the size of the enterprise measured in terms of the labour force engaged in the enterprise. The size class of the enterprises, used for sampling, are 0 – 99, 100 – 499, 500 – 999, 1000 & above. The sample size of a sector is proportionately distributed over the size class.

Sectors and Sub-sectors are –

1. **Agriculture**
2. **Industry**
    1) Mining & Quarrying
    2) Manufacturing
    3) Electricity, gas, steam and air conditioning supply + Water supply; sewerage, waste management and remediation activities
    4) Construction
3. **Services**
    1) Wholesale and retail trade; repair of motor vehicles and motorcycles + Transpiration and storage + Accommodation and Food service activities + Information and communication
    2) Financial and insurance activities + Real estate activities + Professional, scientific and technical activities
    3) Administrative and support service activities + Public administration and defense; compulsory social security + Education + Human health and social work activities + Arts, entertainment and recreation + Other service activities

Detailed procedure of sampling methodology has been discussed below:

1. <u>Sampling Method Used</u>

Sampling method used in the survey is Stratified Random Sampling (SRS).

Stratified Random Sampling: In SRS the population is divided into smaller homogeneous groups (Strata) and then random samples are drawn within each stratum. It is quite similar to a weighted average; this method of sampling produces characteristics in sample that are proportional to overall population.

Advantages:

- It captures key characteristics in samples
- It is useful where population has variety of attributes

2. <u>Defining Stratum:</u>

We have obtained the population (number of production units) from Annual Survey of Industries (ASI) for each state. Then production units of each state are classified according to NIC code. Further, production units under a given sector are divided according to the size of labour employed. Size classes chosen are as follows:

0 – 99, 100 – 499, 500 – 999, 1000 and above, not specified

And then we select required number of production units from each employment (labour) size according to random sampling.

Procedure followed in sampling

A. Identifying and Defining Population:

Organized production units in a particular state are identified as population for the survey. They must belong to agriculture or industrial or service sector to be considered as a member of population.

Determining the desired sample size

Desired sample size from a particular state which will represent the population (total production units), is calculated through the formula developed by Cochran (1963)

$$n_0 = \frac{Z^2 * p * q}{c^2}$$

where,

Z = value of confidence level at 95% (1.96) in normal distribution

c = Confidence Interval (5% or 0.05)

p = the estimated proportion of an attribute that is present in the population (0.5) in other words it is the probability that a particular observation will be selected in the sample, in the worst case it is 0.5 (50%), meaning every observation has an equal chance of being selected in the sample

q = (1-p)

Confidence Interval (Level of Precision) – is the range in which the true value of the population is estimated to be. This range is often expressed in percentage points. In other words the estimation from sample is expected to vary from the true value up to this range. It is also called sampling error.

We have used 5% confidence interval which suggests that sample value may vary from the true value by ±5%, for example 80% of the production units in Maharashtra are innovative. This 80% can vary by ±5% i.e. between 75% and 85% of production units.

Confidence Level – is the proportion of sample which will represent the population given the level of precision or confidence interval.

We have taken 95% level of confidence which shows that 95 out of every 100 samples will have true population value within the level of precision.

Finite Population Correction for Proportions

If the population is small then the sample size can be reduced slightly. This is because a given sample size provides proportionately more information for small a population than for a large population. The sample size obtained for different states is based on the formula –

$$n = \frac{n_0}{1 + \left(\frac{n_0 - 1}{N}\right)}$$

where, N is the number of production units in a state (finite population)

B. Identifying subgroups (Strata) for equal representation

Firstly, the population (production units in a state) is divided between two categories – agriculture and industry, as per the NIC codes, then all the production units are further categorized according to their labour size (already mentioned).

C. Random selection

Finally for selecting the units to be surveyed, random number calculator is used. Random selection is to be done on without replacement basis.

Example:

According to ASI data (2007-08) Karnataka has 10,855 number of production units.

We have already calculated Sample Size (representative sample for proportions) through Cochran formula, where Z=1.96 (at 95%) p = q = 0.5 and C =0.05

$$n_0 = \frac{Z^2 * p * q}{c^2}$$

Which comes out to be 384.16, so by approximation we are using n_0 = 384

Now for calculating the Sample size according to a finite population, we will use the formula below

$$n = \frac{n_0}{1 + \left(\frac{n_0 - 1}{N}\right)}$$

Where N (population, i.e. number of production units in the state) = 10,855 and n_0 is already calculated, so the required sample size i.e. n = 371,

That means we need to survey the 371 production units of Karnataka as whole.

Now question arises which 371, if we apply random selection here only, then we may end up surveying 371 units of a particular Sector either Agricultural or Industry or Services. This will not be the true representation of population, so before applying random selection we will classify the units in Agriculture, Industry and Service sector and their respective sub-sectors and then finally with their labour size. Classification according to labour size is important because through this role of labour size i.e. firm size in innovation will be ascertained.

The table 4 shows the actual no. of production units (population) and the number of sample to be taken from each sector (along with their respective sub-sectors) with respect to their labour size. This will give us the clear process to be followed while taking sample and maintaining its true representation towards the population.

We know that Karnataka has 10,855 production units and required sample size from Karnataka is 371, considering true representation of population, these 371 samples will represent the 10,855 production units.

So the proportion of each production unit in total sample would be

$\frac{371}{10855}$ or 0.0342

To get the required sample size of a particular category the actual number (population) will be multiplied by this proportion.

This method gives us that 345 production units are needed to survey of industry, 8 from Agriculture and 18 from services. Further, of these 345 to be surveyed from Industry, 342 (10,013 X 0.0342) should belong to Manufacturing – a sub-sector under Industry.

After this, firms are further classified with their respective labour size and hence the sample size also gets further distributed as per the labour size. Now 342 firms which we need to survey from Manufacturing (sub-sector of industry), 296 (8677 X 0.0342) should belong to labour size 0-99 and 33 (959 X 0.0342) from labour size 100-499 and so on. This way we will be able to have our population truly represented in the sample size according to sector then sub-sector and then finally respective labour size. A complete and detailed table for all three sectors has been given below (table 4) to make it more understandable.

D. Rounding a zero to one

Another interesting thing is that in some of the categories there exist an actual number but when we multiply it with proportion the number comes out to be approximately zero. So to represent that category we survey any one of the production units, so that it will get some representation.

Table 4: Population and Sample Size of Karnataka

Sectors		Labour Size	Population	Sample
	Total		241	8
Agriculture (A)		0-99	239	8
		100-499	2	0
		500-999		
		1000 and above		
Industry	Total		10100	345
	Mining & Quarrying (B)	Sub-total	0	0
		0-99		
		100-499		
		500-999		
		1000 and above		
	Manufacturing (C)	Sub-total	10013	342
		0-99	8677	296
		100-499	959	33
		500-999	210	7
		1000 and above	167	6
	(D)+(E)	Sub-total	87	3
		0-99	83	3
		100-499	2	0
		500-999	1	0
		1000 and above	1	0
	Construction (F)	Sub-total	0	0
		0-99		
		100-499		
		500-999		
		1000 and above		
Services	Total		514	18
	(G)+(H)+(I)+(J)	Sub-total	466	16
		0-99	440	15
		100-499	20	1
		500-999	1	0
		1000 and above	5	0
	(K)+(L)+(M)	Sub-total	11	1
		0-99	11	1
		100-499		
		500-999		
		1000 and above		
	(N)+(O)+(P)+(Q)+(R)+(S)	Sub-total	37	1
		0-99	35	1
		100-499	2	0
		500-999		
		1000 and above		
Grand Total			**10855**	**371**

Note: for abbreviations see pg. 26

Characteristics of Sample

How similar or different are the states in terms of the samples drawn over the size of the firms? We have tried to explain some characteristics of the sample with the help of Table 5. It presents the number of states/UTs distributed across sectors on the basis of number of firms they have of various sizes.

- Our sample is skewed as is the population. Large numbers of firms belongs to the industrial sector and that too in manufacturing.

- So far as smaller size of firms are concerned (0-99 labour size), we find states have varied number of firms in every sector. But when we move ahead to large sized firms (of labour size 100 – 499, 500 – 999 and 1000 & above) we find, in case of agriculture and services, most of states have no firms.

- Due to less number of firms in Agriculture and Services sector, moreover less number of firms of larger employment base (i.e. 500 & above), we find more firms representing Industry and that too smaller firms.

- In all the three sectors almost 90% of units belong to the stratum of 0-99 labour size; however the percentage share of units belonging to this stratum is highest in Services sector (97%), followed by Agriculture (93%) and Industry (89%) respectively (see fig. 4).

- Agriculture –
  - Only 11 states have varied number of firms of 0 to 99 labour size. Among them 4 states have firms counting between 101 to 500

  - If firms of larger employment base are considered, only 7 states have such firms among which 6 have firms between 1 to 50

Table 5: Distribution of sample & labour size over the states

Sector	Number of Firms → / Labour Size ↓	Nil	1 – 50	51 – 100	101 – 200	201 – 300	301 & above
Agriculture	0-99	23	8	0	1	0	0
	100-499	29	3	0	0	0	0
	500-999	31	1	0	0	0	0
	1000 and above	31	1	0	0	0	0
Industry	0-99	0	1	4	4	12	11
	100-499	0	29	3	0	0	0
	500-999	4	28	0	0	0	0
	1000 and above	8	24	0	0	0	0
Services	0-99	2	30	0	0	0	0
	100-499	22	10	0	0	0	0
	500-999	32	0	0	0	0	0
	1000 and above	32	0	0	0	0	0

Note: Each cell represents number of states with the given number of firms of a particular firm size based on employment base

    - There is only 1 state with number of firms between 1 to 50 of size 500 to 999 labour
    - And only 2 states with number of firms around 1 to 50 of size 1000 & above labour.
- Industry –
    - Since there is large number of small firms in this sector in the population, we find 11 states having 301 & above firms, 12 states having 201 to 300 firms of 0 to 99 labour size in the sample.
    - In other strata of labour size (firm size) we find most of the states have firms around 1 to 50 in the sample.
- Services –
    - Again, due to skewed nature of population most of the samples are the smaller labour size of firms. In case of firms of 0 to 99 labour size 30 states have firms around 1 to 50 in the sample.
    - In case of firms of labour size 100 to 499, 10 states have firms around 1 to 50 in the sample.
    - There is no firm of 500 & above labour size in the sample from any state.

Characteristics described in the table 5 are graphically described in Figure 3.

Figure 3 has horizontal axis as number of firms, vertical axis as number of states and depth axis as firm size based on number of labour employed. The figure shows the number of states having different range of firms of various sizes in industrial sector in the sample. The area is quite skewed towards 1 to 50 numbers of firms, which means when considering larger sized firms our sample have 1 to 50 numbers of firms in most of the states. Only in case of smaller sized firms all the states have larger number of firms in the sample. In other words our sample mainly consists of smaller sized firms in most of the states in case of Industrial sector.

Figure 3: Distribution of samples across states

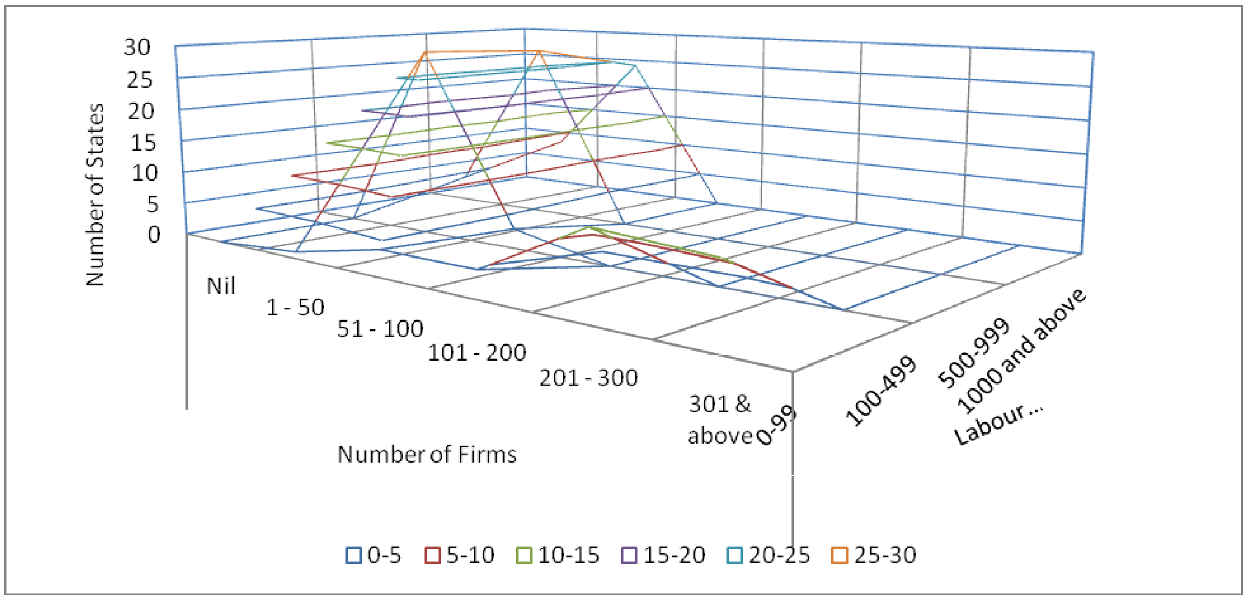
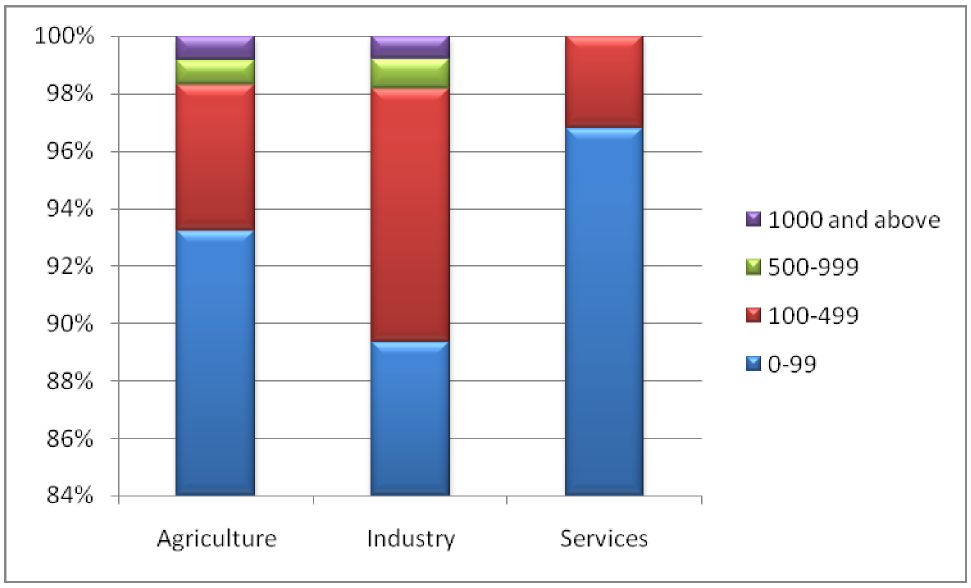


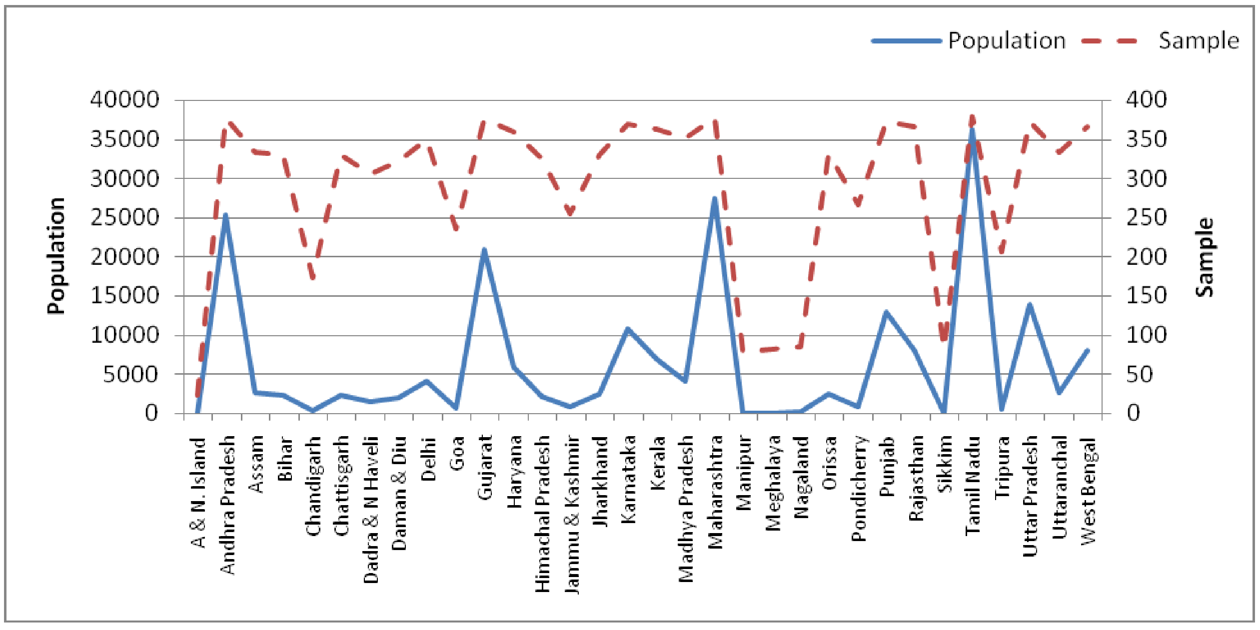
Figure 4 shows overall picture of the sample size over different firm sizes. As expected, agriculture sector has large number of small firms where as industrial sectors are dominated by medium size firms. Services sector, however, is fully dominated by the small firms.

Figure 4: Sample size over different firm size



Distribution of population and sample across states and UTs is shown in figure 5. Horizontal primary axis shows the population and the horizontal secondary axis shows sample. North eastern states of India have lesser number of firms in the sample.

Figure 5: Population and sample size across states



Example of sampling of some states –

Table 6

No. of Production Units Belonging to Different Categories	States --->		Andhra Pradesh		Delhi		Gujarat		Nagaland		West Bengal	
	Sectors	Labour Size	Population	Sample	Population	Sample	Population	Sample	Population	Sample	Population	Sample
	Total		1120	17	0	0	652	12	0	0	0	0
	Agriculture (A)	0-99	1079	16			632	11				
		100-499	41	1			20	1				
		500-999										
		1000 and above										
Industry	Total		23382	349	3705	322	19807	357	103	43	7520	343
	Mining & Quarrying (B)	Sub-total	14	0	0	0	64	1	0	0	2	0
		0-99	13	0			47	1			1	
		100-499	1	0			16				1	
		500-999					1					
		1000 and above										
	Manufacturing (C)	Sub-total	23208	347	3702	322	19656	354	103	43	7506	342
		0-99	22158	331	3465	301	18218	328	100	42	6861	313
		100-499	799	12	187	16	1108	20	2	1	498	23
		500-999	130	2	33	3	213	4	1	0	71	3
		1000 and above	121	2	17	2	117	2			76	3
	(D)+(E)	Sub-total	160	2	3	0	87	2	0	0	12	1
		0-99	145	2	3		77	2			7	1
		100-499	14	0			8				5	0
		500-999	1	0			1					
		1000 and above					1					
	Construction (F)	Sub-total	0	0	0	0	0	0	0	0	0	0
		0-99										
		100-499										
		500-999										
		1000 and above										
Services	Total		753	11	330	29	460	8	5	3	517	24
	(G)+(H)+(I)+(J)	Sub-total	738	11	319	28	444	8	4	3	478	22
		0-99	685	10	302	26	438	8	4	3	463	21
		100-499	51	1	17	2	6				15	1
		500-999	1	0								
		1000 and above	1	0								
	(K)+(L)+(M)	Sub-total	0	0	0	0	13	0	0	0	4	0
		0-99					13				4	
		100-499										
		500-999										
		1000 and above										
	(N)+(O)+(P)+(Q)+(R)+(S)	Sub-total	15	0	11	1	3	0	1	0	35	2
		0-99	15	0	11	1	2		1		34	2
		100-499					1				1	
		500-999										
		1000 and above										
Grand Total			25255	377	4035	351	20919	377	108	46	8037	367

Abbreviations used in Tables 4 & 6

A – Agriculture
B – Mining & Quarrying
C – Manufacturing
D – Electricity, gas, steam and air conditioning supply
E – Water supply; sewerage, waste management and remediation activities
F – Construction
G – Wholesale and retail trade; repair of motor vehicles and motorcycles
H – Transpiration and storage
I – Accommodation and Food service activities
J – Information and communication
K – Financial and insurance activities
L – Real estate activities
M – Professional, scientific and technical activities
N – Administrative and support service activities
O – Public administration and defense; compulsory social security
P – Education
Q – Human health and social work activities
R – Arts, entertainment and recreation
S – Other service activities

Phonetically, the word "innovation" is presumed to be derived from the word "**novation**" meaning a change in the contract renewal for a new debtor. The term was rarely used in the various arts and sciences before the twentieth century. Scholars like N. Machiavelli (*The Prince*, 1513) and F. Bacon (*Of Innovations*, 1625) devoted early pages to innovation, using the term as such, and to the resistance of people to innovation.

B.Godin (2008), *Innovation: The History of a Category.*

6 Status of Survey

The survey of Innovation was initiated in mid of December 2010. There are 9,226 units to be surveyed out of which 7,147 (77%) are covered till October 2011 (see fig. 6). Month-wise progress of the survey is shown in figure 7 and state-wise progress is shown in figure 8. It is expected that the survey would be completed by the end of December 2011. It is also expected that state wise data generated through the survey would be available by December 2011. The next issue of the Bulletin would be based on the broad and preliminary findings from the survey data.

Figure 6: Status of Survey till Oct'11

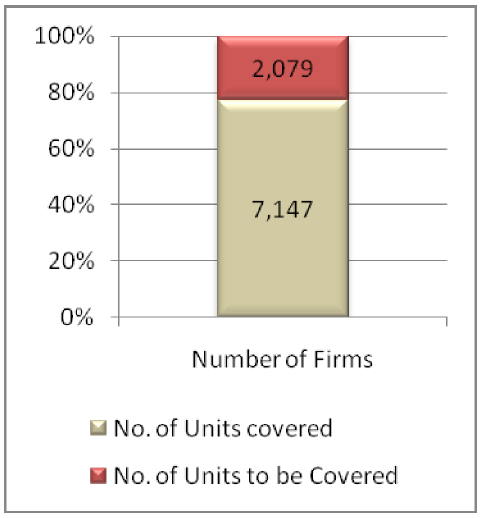


Figure 7: Monthly Survey Progress

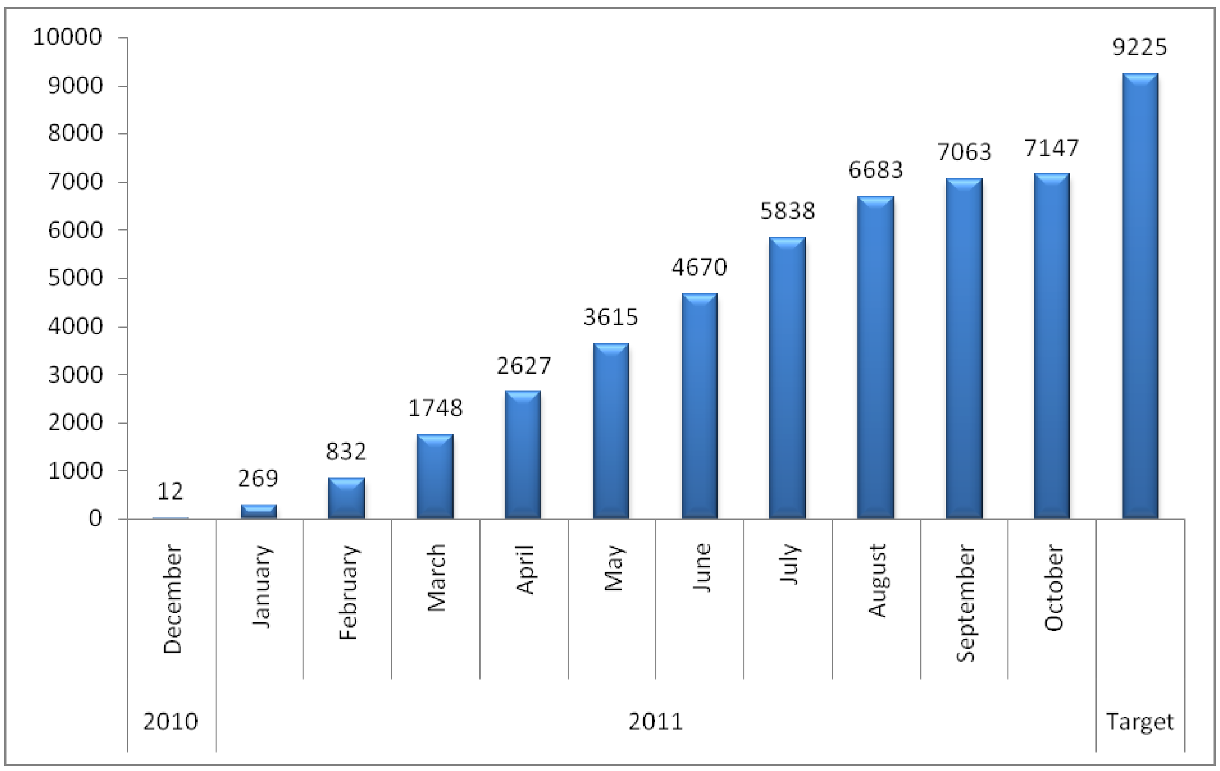
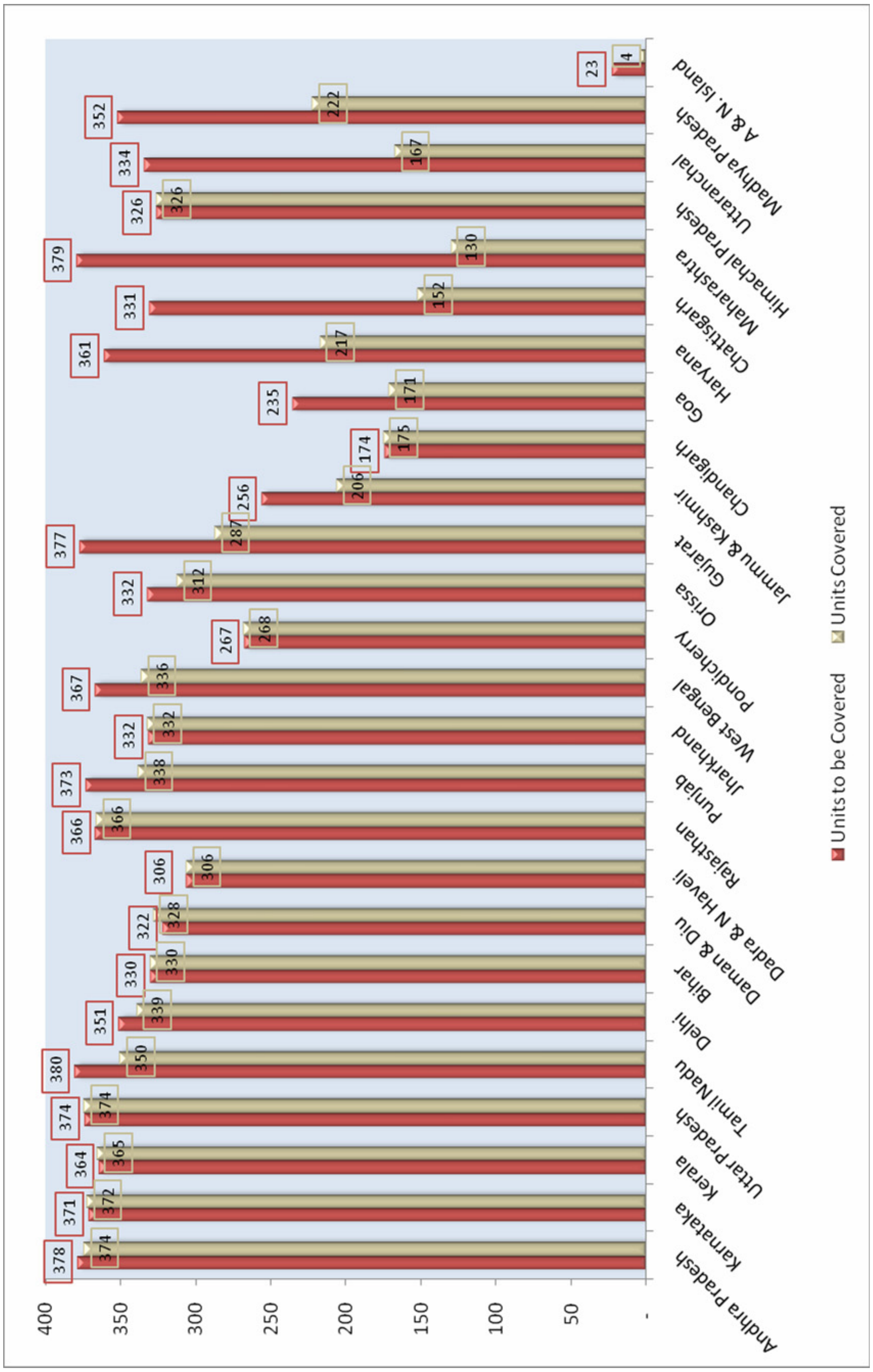


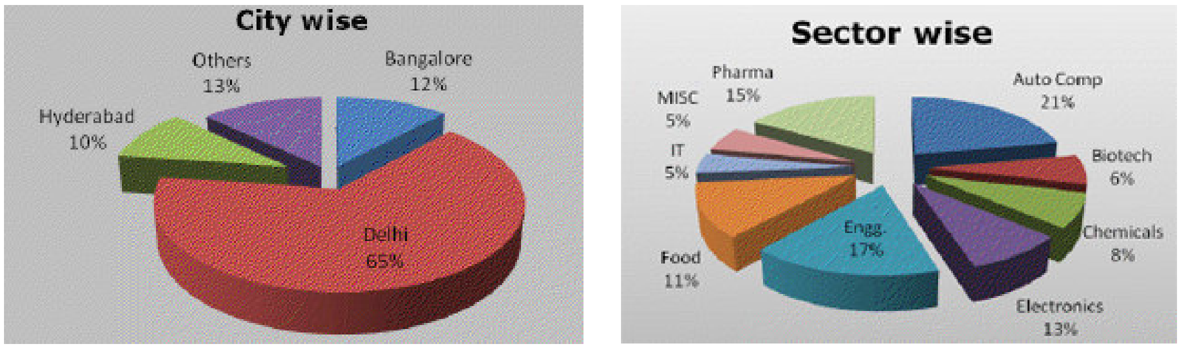
Figure 8: Status of States Covered till Oct'11



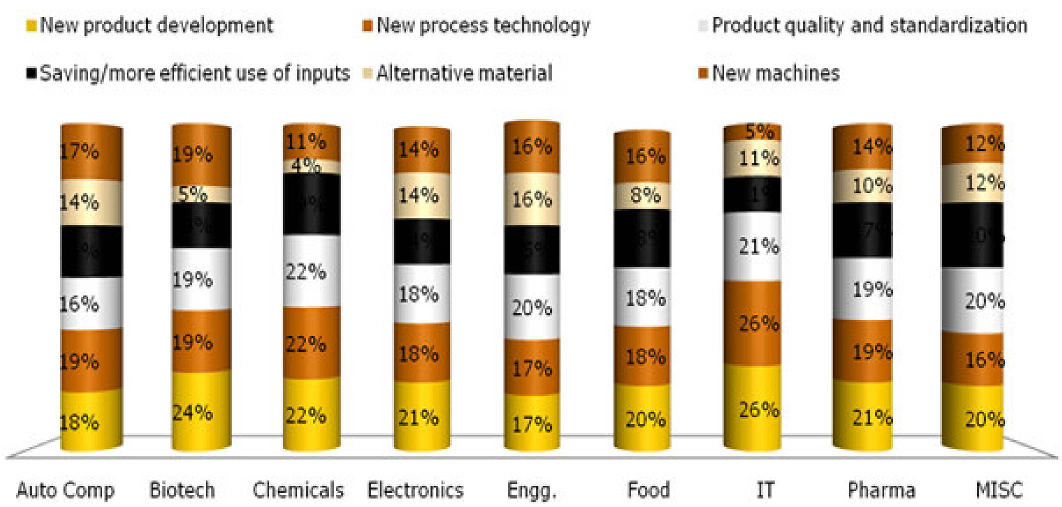
Note: Only those states are shown where at least a single firm is surveyed.

7 Some Reflections from the Pilot Study – National Innovation Survey

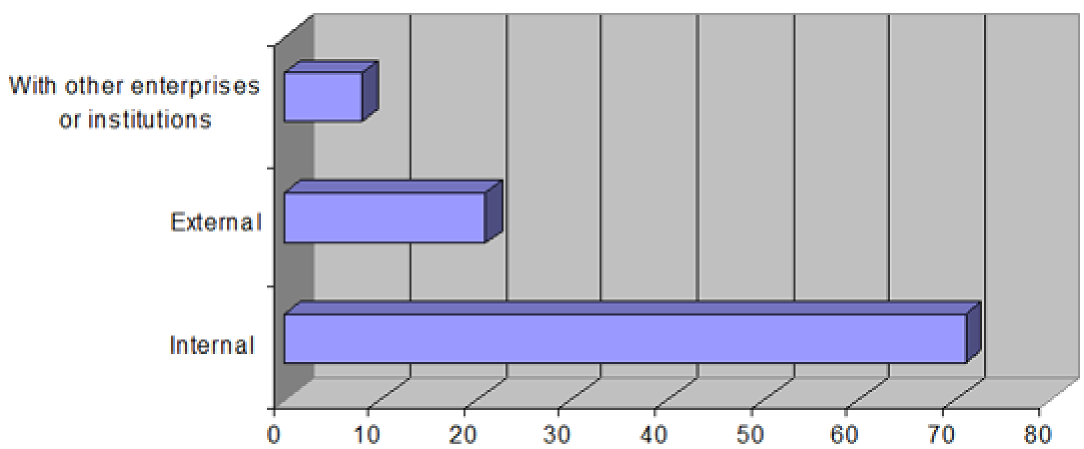
Pilot Innovation Study - Respondents Profile



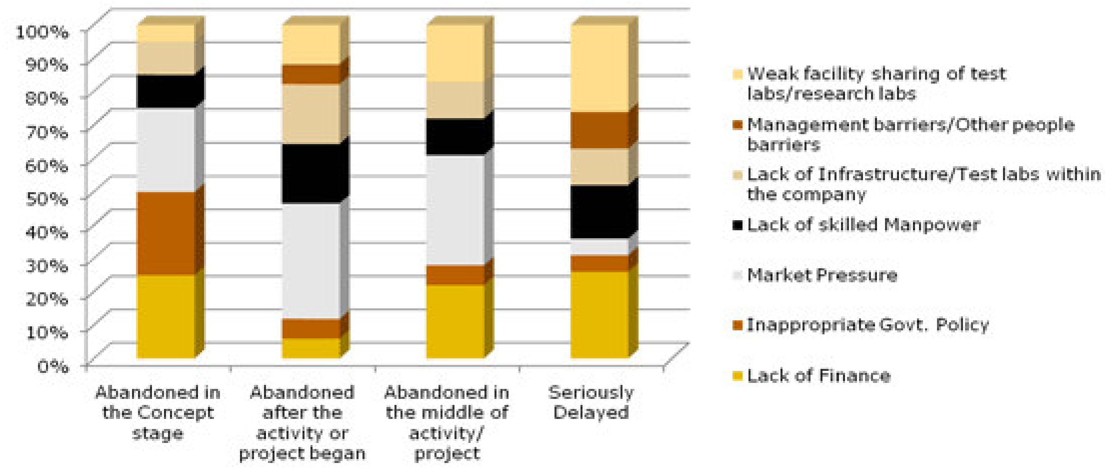
Product/Process Innovation Technological Initiatives



Sources of Innovation



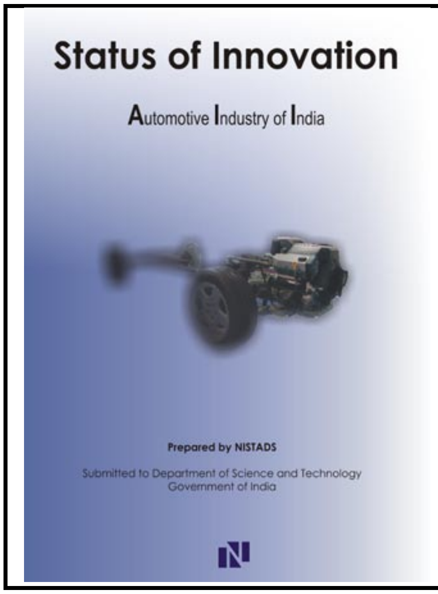
Factors Influencing Innovation Activities



Effects of Innovation

Effects of Innovation	Type of outcomes	Signifi-cant	Insignifi-cant	Relative Score
Product outcomes	Increased range of goods or services	94%	6%	2.88
	Entered new markets or increased market share	91%	9%	2.82
	Improved quality of goods or services	94%	6%	2.88
Process outcomes	Improved flexibility of production or service provision	85%	15%	2.71
	Increased capacity of production or service provision	89%	11%	2.79
	Reduced labour costs per unit output	72%	28%	2.44
	Reduced materials and energy per unit output	80%	20%	2.60
Other outcomes	Reduced environmental impacts or improved health and safety	83%	17%	2.66
	Met governmental regulatory requirements	82%	18%	2.64

8 Reports Available on the Status of Innovation in different Industrial Sectors in India


Status of Innovation

Automotive Industry of India

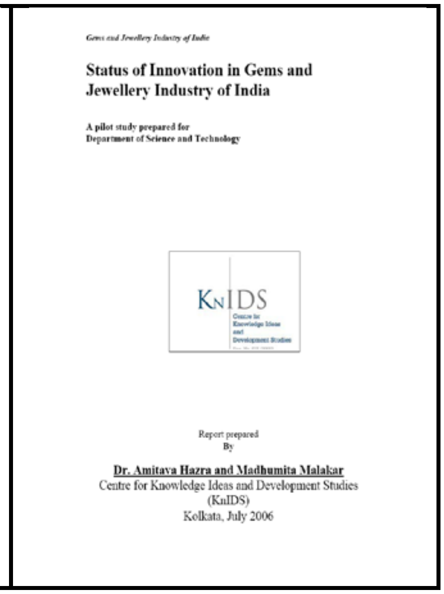
Prepared by NISTADS

Submitted to Department of Science and Technology
Government of India


The Sectoral System of Innovation of
Indian pharmaceutical industry

Sunil Mani

Planning Commission Chair Professor in
Development Economics,
Centre for Development Studies,
Trivandrum – 695011, Kerala, India
E-mail: Mani@cds.ac.in


Gems and Jewellery Industry of India

Status of Innovation in Gems and
Jewellery Industry of India

A pilot study prepared for
Department of Science and Technology

KnIDS

Report prepared
By

Dr. Amitava Hazra and Madhumita Malakar
Centre for Knowledge Ideas and Development Studies
(KnIDS)
Kolkata, July 2006

Details available with the Dept. of Science and Technology, Govt. of India (www.**dst**.gov.in)

CONTACT	
Mr. Pradosh Nath, Chief Scientist CSIR - National Institute of Science Technology And Development Studies (NISTADS) Dr. K S Krishnan Marg, Pusa Campus, New Delhi – 110012 Ph. No. 011 – 25843093 E – mail: nis@nistads.res.in	**Dr. Parveen Arora, Director** National Science and Technology Management Information System (NISTMIS), Department of Science and Technology, Technology Bhavan, New Delhi – 110016 E – mail: parora@nic.in
The Bulletin is available at – **http://www.nistads.res.in, http://www.nstmis-dst.org, & http://www.nationalinnovationsurvey.in**	

November 2011

Ministry of Science & Technology
Department of Scientific & Industrial Research (DSIR)

Fiscal Incentives for Scientific Research

- 100% write-off of revenue expenditure on R&D under section 35(1)(i) of I.T. Act, 1961.
- 100% write-off of capital expenditure on R&D in the year the expenditure is incurred under section 35(1)(iv) of I.T. Act, 1961.
- Weighted Tax deduction @200% on expenditure incurred in approved in-house R&D facility, to companies engaged in business of biotechnology or in any business of manufacture or production of any article or thing *(**not** being an article or thing specified in the list of the eleventh schedule)* under section 35(2AB) of I.T. Act 1961. Provision is valid till 31.03.2012.
- Income tax rebate @175% on donations for scientific research made to non-commercial organizations approved under section 35(1)(ii) & 35(1)(iii) of I.T. Act 1961.
- Tax Holiday for 10 consecutive assessment years to commercial R&D companies under section 80-IB(8A) of I.T. Act, 1961 approved before 31.03.2007.
- Weighted Tax deduction @200% for Sponsored Research Programmes in approved national laboratories, universities and IITs [Section 35(2AA) of I.T. Act]
- Accelerated depreciation allowance @40% on new plant & machinery set-up based on indigenous technology as per Rule 5(2) of I.T. Rules.
- Customs duty exemption on goods imported for R&D and central excise duty waiver on purchase of indigenous goods for R&D to public funded R&D institutions. [Notification No.51/96-customs dated 23 July 1996 and Notification No. 10/97-central excise dated 1 March 1997]
- Customs duty exemption on goods imported for R&D and central excise duty waiver on purchase of indigenous goods for R&D to research institutions approved by DSIR. [Notification No.24/2007-customs dated 1 March 2007 and Notification No. 16/2007-central excise dated 1 March 2007 as amended from time to time]
- DSIR recognised in-house R&D units engaged in R&D in bio-technology and pharmaceuticals sector, can import specified equipment duty free (List 28). In respect of R&D units with manufacturing facilities, the benefit of full customs duty exemption for specified equipment is also available for manufacturing activity to the extent of 25 per cent of the previous year's export turnover.
- Customs duty exemption on imports made for R&D projects for use in projects funded by Govt. in industries [Notification No.50/96-Customs dated 23 July 1996]
- Excise duty waiver for 3 years on specified goods designed & developed by a wholly owned Indian company, national laboratory, public funded research institutions, or university and patented in any two countries from amongst India, USA, Japan and in any one country of the European Union. The specified goods are manufactured by a wholly owned Indian company. [Notification No.13/99-central excise dated 28th February 1999]. This exemption is available based on certification from DSIR.
- Various funding schemes of Govt. of India for technology development, upgradation and commercialization

www.dsir.gov.in

Printed at
CSIR – National Institute of Science Communication And Information Resources (NISCAIR),
Dr. K S Krishnan Marg, Pusa Campus, New Delhi – 110012