

II - C. TECHNOLOGY MANAGEMENT PROGRAMME

1. PREAMBLE

The Technology Management Programme continued its operations during the year 2005-2006 and completed a number of activities that were targeted for the year.

2. OBJECTIVES

The major objective of the Technology Management Programme is to provide technical inputs and support mechanisms for efficient transfer and management of technology. Aspects concerning management of technology are gaining special significance with the recognition that technology and innovation are competitive elements in the current era of intense technological competition and enhanced innovation. Technology Management is undoubtedly the key to performance in every sphere of activity in the current environment. Specific programmes targeted towards enhancing technology management capability building in industry, R&D institutions, academic institutes and other establishments have therefore been initiated. The beneficiaries are from different spheres of society and include industry organizations, academic institutes, research organizations, executives, faculty and students, researchers, consultants, industry associations, financial institutions, entrepreneurs, small and medium enterprises, Government departments and agencies, innovators and the society at large.

3. ACTIVITIES

The activities of the Technology Management Division are aimed at enhancing knowledge and skills in the efficient management and

transfer of technology. Several measures have been initiated to generate a knowledge base in technology issues, to facilitate awareness building and provide training and capability enhancement. These measures together effectively complement the other programmes of the Department in the attainment of technological excellence.

The major activities undertaken are aimed towards:

- Providing assistance in efficient transfer of technology, through information in respect of foreign collaborations approved and analysis of such approvals as well as focused studies;
- Enhancing knowledge base in respect of technologies specific to the nation, including rural based technologies and region/sector specific technologies by undertaking analytical studies, technology status and development studies;
- Providing information to industry, Government departments, researchers through targeted research studies and policy research;
- Promoting industry-institute interaction by setting up resource centers on technology management in appropriate locations;
- Enhancing academic interest and contribution through active collaborations and memorandums of understanding with academic institutes;
- Motivating State level agencies and research organizations to take up activities in the realm of Technology Management;

- Information dissemination on Technology Management related aspects through newsletters, manuals, and other forms
- Promoting an understanding of Technology Management in the Indian scenario through case studies of manufacturing and research organizations in the country, distinguished technologists lecture series etc, and
- Promoting an understanding of technology management, its need and importance in the current competitive environment through development of course modules, awareness programmes, focused training, seminars and management development programmes, and guidance to trainers.

4. Work completed/undertaken during the year

During the year, in addition to the on-going work, some more need based programmes and activities have been taken up.

4.1 Database on approved foreign collaborations

The Department has a large database of foreign collaborations approved. Secretariat for Industrial Assistance (SIA), Ministry of Commerce & Industry and Reserve Bank of India issue the foreign collaboration approval letters, which are being comiled.

To make the information more user friendly, a project for development of software to generate and analyse the data has been assigned to Institute of Informatics and Communication, Delhi University. The objective of this project that is divided into two phases is to develop a database of all the

foreign collaboration approvals during past years with the facility to provide analysis, compilation and submission of web reports. The technical features of the system are to (a) maintain the relational database of each organization/institute (b) increase security (c) avoid misuse (d) provide transparency (e) decrease the chances of manual errors and (f) create log file to ensure appropriate updates. The project is in progress.

4.2 Analytical, Technology Status and Development Studies

Industry, policy makers, academic and research institutes need to be made aware of areas of their concern relating to technologies in which effective action can be taken to mitigate problems and enhance efficiency. Also, there are many region specific resources in different States in the country that have spawned industries, which could benefit through further research and analysis in respect of value addition, technology upgradation and information dissemination. Identification of technology gaps in existing industries in respect of important products and processes is an important requirement that needs to be continually addressed.

There has thus been need for studies covering sector-specific status of technology in the country, international trends, gaps in technology, research facilities and other such information; in respect of specific identified products, processes. There are also a number of areas where there is need for indigenous development of technology and for value addition, including rural based technologies, in respect of which information collection and analysis is required. Some such areas have been identified on need basis and studies have been undertaken.

Studies on 'Potential of Minor Forest Produce (MFP) based industries in select regions'

Status studies of minor forest produce (MFP) and industries based on non wood forest produce of select regions have been undertaken. That pertaining to the State of Gujarat has been taken up by Gujarat Industrial and Technical Consultancy Organization Ltd. (GITCO); that of Tamil Nadu by Industrial and Technical Consultancy Organization of Tamil Nadu Ltd. (ITCOT) and that of West Bengal by West Bengal Consultancy Organization Ltd., (WEBCON) Kolkata; that of the States of Uttar Pradesh and Uttaranchal undertaken by UP Industrial Consultants (UPICO), Kanpur and that of Andhra Pradesh by APITCO, Hyderabad. The broad objective of these studies is to carry out a survey of the respective States, assess the availability of MFP and also to assess the industries which are dependent on MFPs as raw materials for their industries. The studies would find out the status of technologies available in the country and suggest measures towards generation of value added products based on these raw materials. Select project profiles relevant to the specific regions would also be brought out. The Draft Reports have been prepared and are being evaluated. The study on Potential of MFP in Uttar Pradesh and Uttaranchal has been completed.

a) UP and Uttaranchal

The report discusses in detail the availability of minor forest produce in Uttaranchal and Uttar Pradesh, Minor Forest Produce based manufacturing units in the States, technology status including process know-how and production technologies, technologies needed to be developed in view of availability of raw materials, future course of action for research, cultivation technologies available, export and import trends in MFP, potential for MFP

based Industries in Uttaranchal and UP and strategies required for promotion of MFP based industries in these States.

b) Gujarat

The report is being revised based on the suggestions of the Evaluation Committee. The report discusses status of MFPs in Gujarat, MFP processing industry, domestic and export market, technology aspects, technologies for value addition, R&D status, industry potential etc. The report includes select project profiles.

c) Andhra Pradesh

The report is under finalization. An attempt has been made to sum up the total availability of minor forest produce in Andhra Pradesh. About 68 products were identified based on the information collected from different districts, out of which 38 products were identified for detailed study. Project profiles of 37 products have also been presented. Suggestions for overall improvement have been included.

d) Tamil Nadu

The report reveals that the State of Tamil Nadu is having a forest area of around 1.71 million hectares and the main MFPs are Amla, Tamarind, Cashew, Silk cotton, Mayo, Neem, Dali beans etc. Major user industries of MFPs are manufacturers of Ayurveda, Siddha and herbal medicines.

e) West Bengal

The draft of the report has been submitted and is being taken up for evaluation. The State has six typical varieties of forests including tropical, moist, deciduous and alpine; and there are more than 300 different types of MFPs. The two most copious ones in Government Forest areas are sal seeds and kendu leaves.

Study on status of technology in selected Cottage and Tiny Industries of Madhya Pradesh and Chhattisgarh

The study has been entrusted to MP Consultancy Organization Limited (MPCON), Bhopal. The objective of the study is to select cottage and tiny units in some districts of the States to assess: the status of technology; the need for technology upgradation; potential for productivity enhancement and value addition; export potential.. The draft report has been submitted and discussed in an Evaluation Committee Meeting. The report is under finalization.

A study on the Status and Potential of Karaya Gum

The study has been entrusted to UP Industrial Consultants Limited (UPICO), Kanpur. The primary objective is to identify actual availability of karaya gum viz-a-viz its plants from the forest areas or otherwise and its possible utilisation by the industry. A draft report has been brought that would be discussed in an Evaluation Committee Meeting.

Study on the Technology Status on Isabgol based Industries

This study has been taken up by Consultancy Development Centre (CDC), New Delhi. The main objective of the study is to study the status of the industries based on isabgol by carrying out a market survey about its availability, its consumption level and future potential; as well as present the international scenario. The Draft Report of the study has been prepared and it has been evaluated by an Evaluation Committee. The report highlights important medicinal applications of isabgol, status of isabgol industry in India, international scenario of the isabgol industry, research and development in the isabgol

industry in-house R&D, selected clinical results, specifications, technology absorption, thrust areas and potential for new industry. The Final Report is under preparation.

Study on Status of Technology and Scope of Technology Improvement in Handloom, Powerloom, Readymade Garments Sector in West Bengal by West Bengal Consultancy Organization Ltd. (WEBCON), Kolkata

The study has been taken up by West Bengal Consultancy Organization Ltd. (WEBCON), Kolkata. The objective of the study is assessment of technology status and scope for improvement in the handloom, power loom and ready made garments sector in West Bengal.

Study on development of beel fisheries and various species of bamboo in NE states

The study has been entrusted to the North Eastern and Technical Consultancy Organisation Limited (NEITCO), Guwahati. The study would collect data on quantitative availability and characteristics of various species of bamboo as well as fish in the whole of northeastern region and try to analyse these data to arrive at conclusions for the best possible use of these materials by the industry and others in the region.

4.3 Studies on technology and innovation management issues

Technological dynamism has become the order of the day and new approaches; tools and techniques are being developed in technology and innovation management areas. Studies - in such emerging areas for harnessing value from knowledge leading to further knowledge creation, on technology transfer issues and technology up-gradation measures, and in other technology areas - have been taken up. Specific studies for the benefit of small and medium enterprises have

also been taken up. Identified sectors that offer opportunity for growth have been among those selected for study. These study reports are widely disseminated and have benefited industrial units, R&D organizations, academic institutes, Government departments and others.

Technology audit of Handicraft Artisan Units in the Coastal Districts of Karnataka

The project has been taken up by NITK-Science & Technology Entrepreneurs” Park, Karnataka. The objective of the project is to undertake a technology audit of the handicraft artisan units located in coastal Karnataka. The project has been completed. Separate workshops were conducted for each of the three sectors to disseminate the findings.

Study on the status and prospects of Industry-Institute Collaborations in Emerging Technologies by Confederation of Indian Industry (CII), Gurgaon

The study has been entrusted to Confederation of Indian Industries (CII), Gurgaon. The basic objective of the study is to bring out the status and prospects of industry-institute collaborations in the field of nano technology. CII had made a draft report which was discussed in an Evaluation Committee Meeting at DSIR and the report is being revised on the basis of recommendations made at the Meeting

Study on ‘Management of Technology in the Automotive sector’

The study has been assigned to Management Development Institute (MDI), Gurgaon. The main objective is to study aspects related to management of technology in the automotive sector that is having immense potential to grow and develop further in the country, create a dedicated research team to this end and suggest measures for furthering

innovations in this vibrant sector. The draft report has been brought out by MDI which will be discussed in an Evaluation Committee Meeting.

Study titled ‘Social Capital and Technology’

The study has been undertaken in association with T A Pai Management Institute (TAPMI), Manipal. The study would undertake research and analysis on the manner in which technology has shaped and continues to shape social capital among professional groups; both a qualitative as well as a statistical analysis would be undertaken, as part of the project. The draft report has been submitted that would be taken up for evaluation.

Technology audit of Fish Processing Industry in the Coastal Districts of Karnataka

The project has been taken up by NITK-Science & Technology Entrepreneurs” Park, Karnataka. The objective is to assess the existing practices for fish harvesting and evolve innovative and cost effective technologies for the same and to assess the present status of post harvest technologies.

4.4 Targeted research studies on specific issues in technology transfer, technology and innovation management

There is need for serious research and study of several aspects concerned with management of technology in different sectors that are important for the economic uplift of the nation. This is to develop an objective understanding of complex situations demanding a focused direction. Such research efforts not only result in comprehensive information and data collection of a specific nature but also enable analytical decision-

making. With this in view, the Division has been making focused efforts at promoting an objective analysis of situations requiring study, analysis and research. During the year, some more need based research studies were undertaken.

Study on 'Women Representation in Corporate R&D'

The study had been assigned to IIM Calcutta. The basic objective of the study is to examine the determinants of women leadership in R&D Departments of various corporate organizations. The study in phase III to evaluate explicit gender policies in organizations, identify specific issues with reference to high growth companies as against conservative industries, is nearing completion.

Development of a Model for Evaluation for Innovations in SMEs

The study has been taken up in association with IISc Bangalore. The objective is to develop a model of innovation in select entrepreneurial technology based small and medium enterprises drawn up from amongst select sectors. The draft report has been discussed in an Evaluation Committee Meeting. The report is under finalization.

Study on 'An empirical analysis of the status of collaborative R&D in India'

The study has been entrusted to IIM Indore. The main objective of the study is to understand the perception of Indian industries related to collaborative R&D, identify the factors that impede Indian industry to carry out collaborative R&D, estimate the impact intensity of these factors on the probability of adopting collaborative R&D and bring out the difference across industries or technologies. The draft report has been brought out.

Study on 'Managing strategic transformation of high-tech firms in India'

The study has been entrusted to IIM Calcutta. The study would research into the process of strategic transformation by companies that wish to move up the value chain, in the case of two specific industries viz. pharmaceutical and information technology. The study is in progress.

Study on 'Building technological capabilities through strategic development of industrial clusters'

The study has been entrusted to IIM Ahmedabad. The project aims to broadly study the mechanisms that firms use to learn from each other in order to enhance their technological capabilities and consequently their competitiveness and identify what allows clusters to achieve this objective. The study is in progress.

Research Study on Competitiveness Evaluation for Emerging Technologies

This study has been taken up by Department of Management Studies, IIT Delhi. The basic objective of the study is to identify key elements of strategy of competitive countries in emerging industries to enhance competitiveness of their emerging industries; understand the dynamics of competitiveness in emerging industries to identify key success factors; and evolve criteria of evaluating competitiveness of the industries and assess the availability, cost and quality of data for the purpose. The study is in progress.

Project on IP Audit

The project had been taken up in association with Waterfalls Institute of Technology Transfer (WITT), New Delhi. A Manual on IP Audit has been prepared and a workshop has

been organized. The project has been completed.

4.5 Case Studies covering Technology Management aspects

The objective is to generate learning from best practices and to study and analyze the manner in which technology is managed in Indian enterprises. Apart from being useful for pedagogic use, these case studies also provide useful information to consultants and executives from industry.

Case Studies on Industrial Clusters by IIT, Kanpur

Case Studies on select industrial clusters in the the State of Uttar Pradesh has been taken up in association with IIT, Kanpur. The objective is to understand and document the issues that underline the sustained competitive advantages of three clusters – the leather processing cluster of Kanpur, the silk producing cluster of Varanasi and the brass work cluster of Moradabad. More case studies of manufacturing organizations in different sectors are in progress.

4.6 Collaborative work with Academic and Research Institutes

In order to give the necessary thrust to formal education and develop a base of teaching tools on technology management aspects, the Division has been collaborating with academic institutes, especially those concerned with technical and management education. Different activities, inclusive of management development programmes and projects on technology and innovation management in association with IIM Ahmedabad, IIM Kolkata and IIM Indore are under progress. Work taken up at IIT Bombay, IIT Kanpur, IIT Delhi, IIT Madras has progressed. Projects undertaken in partnership with other institutes, including

ASCI Hyderabad, IISc Bangalore, PSGIM Coimbatore, NITK, Birla Institute of Technology Ranchi, Management Development Institute Gurgaon, T.A. Pai Management Institute Manipal and others have also progressed.

4.7 Industry-Institute Networking with State level, research and other agencies on Technology Management

During the year, its interaction with several State level bodies across the country continued with increased vigour, apart from its continued collaboration with research institutions. Collaborative activities have been taken up in partnership with Madhya Pradesh Council of Science & Technology, Karnataka Council for Technological Upgradation, different State level Technical Consultancy Agencies including MPCON Bhopal, APITCO Hyderabad, MITCON Pune, NEITCO Guwahati, UPICO Kanpur, MITCON Pune, GITCO Ahmedabad, ITCOT Chennai, WEBCON Kolkata and CDC New Delhi.

4.8 Centres for Technology Management (CTM)

The Division has initiated the setting up of Centres for Technology and Innovation Management in different locations of the country where there is access to information on aspects concerned with the subject that are of specific interest to the region of concern, expertise to advise and provide guidance on issues concerned with technology management, and generate long-term as well as short-term solutions. The activities taken up have been wide ranging: training, research, cluster development studies, case studies, scouting innovation, manpower development, interfacing between academia and industries, data generation, sharing of knowledge and providing solutions to industries, preparation

of technology related policy studies, developing training tools and modules.

Centre for Technology Management (CTM) at PSG Institute of Management, Coimbatore

Phases-I and II have been completed. The activities undertaken included several training programmes on different aspects of Technology and Innovation Management apart from a survey on technology issues in pump and foundry industry for assessing the status of the Coimbatore industry. The 3rd Phase has commenced during the year. Activities proposed include: identification of promising SMEs for focused attention, development of a local data base, conduct of technology upgradation and development programme for 6 units, organization of workshops/seminars, conduct of work studies and case studies, a national level yearly journal on TM, preparation of audio visuals, CTM Newsletter and creation of a website, in addition to creation of a resource cell in the CTM. During the year, activities carried out include a programme on Creating Leadership, a Study on Technology Upgradation in Pump Industry, a China Orientation Certification programme, introduction of an elective course on Technology Management for II year PG students, a Survey on Common Modern Tool Room, in addition to bringing out CTM newsletter.

Centre for Technology Management at Madhya Pradesh Council of Science & Technology (MPCOST), Bhopal

A number of activities related to technology management have been initiated under Phase I. The activities include specific region need-based study reports, bringing out of a periodic publication, the organization of training programmes and workshops on specific Technology Management related issues and

awareness generation programmes. A case study of the industrial units of Govindpura Industrial Cluster in Bhopal, a study on Technological Aspects of Medicinal Plants in Madhya Pradesh, two workshops on Technology Management, a Bulletin on Technology Management are among the activities completed

Centre for Technology Management at IIT, Bombay

Work has been undertaken as set of collaborative activities under an MOU. Phase I had been completed earlier and Phase-II is nearing completion. Under these phases, activities taken up include: Management Development Programmes, Case Studies on TM aspects as well as research studies on contemporary TM issues, teaching courses, Newsletters on TM issues and development of a portal. Initiation of phase III is on the anvil

Centre at Karnataka Council for Technological Upgradation (KCTU)

Collaborative activities undertaken in association with the Karnataka Council for Technological Upgradation Bangalore, a joint venture organization between the Central and Karnataka State Government, were continued. Cluster level case studies, focused training programmes, information dissemination of technology management aspects specific to the region and bringing out of newsletters are among the activities taken up during phase I. During the year, an audio visual programme on Technology management, covering initiatives under the MOU with KCTU, has been prepared. Phase I has been completed.

4.9 Curriculum development

An initiative towards curriculum development in Technology management has been launched by the Division during the year. Preparation of five course modules is being

taken up as a first measure. Towards this, the five specific modules have been prioritized, course coordinators for each of these have been identified and the tasks have been assigned. Each module in turn has been divided into twenty topics and specific topic writers have also been identified. The task of writing has been allocated. The course modules are under preparation.

4.10 Information dissemination

To enhance understanding and appreciation of the importance of aspects concerned with management of technology, mechanisms for information dissemination on technology management aspects have been initiated. These include: Newsletters, Manuals, Paper contests on specific technology related issues, Compilations of articles, Audio-visual aids, Portals and others. Information that is region specific, or relating to globally world wide emerging aspects, or nationally important issues, or sector specific information and even general educative articles are all included to impart the requisite information and value, depending upon the actual medium or product, and its specific use.

Newsletters

The Division has been bringing out newsletters on specific technology management aspects in association with IIT Bombay, PSGIM Coimbatore, KCTU Bangalore and MAPCOST Bhopal.

Electronic Newsletter

An electronic newsletter developed in collaboration with IIT Madras had been launched. Two issues have been published and the third is underway. The objective of the Newsletter is to enhance technological creativity and interest in technology development among various target groups. The newsletter features information on

various technologies, case studies, and technology morphologies; and provide basic foundation in various aspects of technology management. .

Portals for information dissemination

Portals and other interactive media are under development in association with ASCI Hyderabad, IIT Bombay, PSGIM Coimbatore and other organizations.

4.11 Training/Interaction meets/Seminars/ Management Development Programmes

During the year, the following programmes have been/are being organized.

- A Management Development Programme for the benefit of industry professionals on 'R&D Management' was organized in association with IIM Kolkata.
- A number of short-term courses and programmes on varied technology management issues were organized by the Center for Technology Management at Coimbatore.
- Workshops, courses and management development programmes on technology and innovation management issues were organized by School of Management at IIT Bombay as part of an on going collaborative project with the Division.
- A 3-months training programme on Technology Management in IT Sector at Patna in Bihar was organized by Institute of Entrepreneurship Development, Bihar.
- A training programme on Technology for Small Enterprises in Machine Tools Sector was organized by RJS Institute of Management Studies, Bangalore.
- A national seminar on Technology Management and Human Engineering was organized in association with ICFAI

- Business School and Maratha Chambers of Commerce, Industry and Agriculture, Pune.
- Training programmes on Technology Management of six months duration in Food Processing Technology and Herbal & Medicinal Plant Processing Technology are being organized in partnership with Institute of Entrepreneurship Development, Bihar.
 - A one-day National Seminar on IPR issues is proposed to be organized at Imphal in North Eastern Region of the country in association with NRDC.
 - A workshop on IT & HR – Opportunities & Challenges is being organized at Velammal College of Engineering, Chennai.
 - Ten workshops on Technology Management Issues are being organized in different cities of the country in association with CDC, New Delhi.
 - Two International Training Programmes on Technology Management Issues for SMEs are planned to be held in Pakistan and Vietnam in collaboration with CDC, New Delhi.