

# II-C. Technology Management Programme

## 1. PREAMBLE

The Technology Management Programme continued its operations during the year 2008-09 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 and that a strategic approach is called for to manage the complex processes involved and gain a significant threshold. 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 and consultancy organizations, 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 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:

- 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;
- Curriculum development exercises;
- Enhancing academic interest and contribution through active collaborations and memorandums of understanding with academic institutes;
- 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;
- Initiating 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



## DSIR Annual Report 2008-2009

- Promoting an understanding of Technology Management in the Indian scenario through case studies of manufacturing and research organizations in the country, etc.
- Conducting awareness programmes, focused training courses, seminars and management development programmes, and providing guidance to trainers.

### 4. WORK COMPLETED/ UNDER-TAKEN 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 Analytical, Technology Status and Development Studies

There has 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. 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. Industry, policy makers, consultants, academic and research institutes are provided with implementation in areas of their concern relating to technologies in which effective action can be taken to mitigate problems and enhance efficiency. Some such areas have been identified on need basis and studies have been undertaken.

#### *Study on development of beel fisheries and various species of bamboo in North Eastern States*

The study was entrusted to the North Eastern and Technical Consultancy Organization Limited (NEITCO), Guwahati. After the evaluation of the draft report brought out by NEITCO by an Evaluation Committee comprising of concerned Government Departments, industry and academic representatives, research agencies and experts, the final report of the study was brought out. The report is based on an analysis of data collected on quantitative availability and characteristics of various species of bamboo as well as beel fisheries in the whole of northeastern region. Conclusions have been drawn and recommendations indicated to better the prospects of the involved agencies and individuals, both in the short term as well as in the long term. The project has been completed.

#### *Study on Status of Technology in Castor Oil & its Derivatives in India.*

The study was entrusted to Gujarat Industrial & Technical Consultancy Organization Ltd. (GITCO), Ahmedabad. The objective of the study was to assess technology status and scope for improvement in Castor Oil & its Derivatives in India. After the evaluation of the draft report by an Evaluation Committee comprising Government Departments, Castor Oil Manufacturers, academic and R&D institutes, etc., the final report of the study has been brought out. The report has broadly brought out an overview of the Castor Oil & its Derivatives in India, technologies in use, technologies for improvement of these sectors, research and development, a SWOT analysis of the technologies and the practices in use, the availability of newer technologies, issues involved in marketing, raw material, infrastructure, etc. for improving the productivity in these sectors. The project has been completed.

#### *Study on Status & Potential of E-waste Management in India considering Social, Economic and Environment Aspects*

The study was entrusted to ELCINA, Electronics Industry Association of India, New



Delhi. The objective of the study was to explain the nature of e-waste, reasons for its proliferation and realistic assessment, ramifications and extent of the problem. After the evaluation of the draft report by the inter-Departmental Project Guidance-cum-Review Committee meeting comprising of the Department of Environment, R&D institutes, industry and other Government Departments, the final report of the study has been brought out. The study broadly covers origin and sources of e-waste, constituents of e-waste, the impact of e-waste on environment and health, e-waste value chain, existing legislation in India and other countries, e-waste recycling technologies, technology gaps and future roadmap for developing e-waste industry in India. The findings of the report were disseminated through a workshop organized by ELCINA. The project has been completed.

#### 4.2 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 Fish Processing Industry in the Coastal Districts of Karnataka*

The project was taken up by NITK Science & Technology Entrepreneurs' Park, Karnataka. The objective of the study was to assess the existing practices of fish harvesting being deployed along the coastal districts of Karnataka and to suggest innovative and cost effective

technologies for the same. An analysis of the present status of post harvest technologies in the region was also included. After the evaluation of the draft report brought out by NITK-STEP by an Evaluation Committee comprising of representatives of concerned Government Departments, industry, academic and research organizations, the final report of the study has been brought out. The findings of the report were disseminated through Workshops organized by NITK S&T Park, Karnataka. The project has been completed.

##### *Diagnostic and Cluster Development Studies related to Makhana and Rice Clusters in Bihar*

These studies were initiated in association with Technology Management Centre at Institute of Entrepreneurship Development (IED) Patna, Bihar. The survey work has been completed and reports have been prepared.

The study on Makhana has brought out areas of its cultivation, cultivation practices, land and water requirement, harvest and post-harvest operations and related technologies, legal aspects, marketing structure, natural and health hazards and recommendations for improving the Makhana cultivation in the State of Bihar.

The study on Rice Cluster Development has discussed in detail the rice cluster scenario in Bihar, physical and natural resources, types of soil, rice varieties grown, rice milling industries in the State of Bihar starting from product range to procurement of paddy, production and productivity, marketing and export, backward and forward linkages, value chain analyses and key problem areas including technological deficiencies and marketing problems.

#### 4.3 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 'Managing strategic transformation of high-tech firms in India'*

The study was entrusted to IIM Calcutta. The broad objective of the study was to research into the process of strategic transformation by companies that wish to move up the value chain. Two specific industries, namely the pharmaceutical and information technology sectors, have been focused upon in this project. After the evaluation of the draft report submitted by IIM Calcutta by an Evaluation Committee comprising of several industry experts and representatives from Government Departments and academic institutions, the final report of the study has been brought out. The findings indicate that a number of IT services and Pharmaceutical firms have made strategic moves to be at the forefront of global leadership by making use of emerging opportunities. The strategic transformation journey in recent years has included measured steps to move up the value chain and escalate the global commitment. The project has been completed.

### *Research Study on Competitiveness Evaluation for Emerging Technologies*

This study was taken up by Department of Management Studies, IIT Delhi. The basic objective of the study was 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 final report of the study has been brought out and its findings were disseminated through workshops organized

in collaboration with IIT, Delhi and IIT, Bombay in Mumbai. A workshop was organized.

### *Study of Knowledge Management in Auto Component SME Clusters in the NCR Region*

The research study was taken up by Institute for Integrated Learning in Management (IILM), New Delhi. The objective of the project was to study the current status of knowledge management practices in the Auto Component SME Clusters covering technologies, process and people aspects of knowledge management and to identify strength and weaknesses in knowledge management practices in this sector. After the evaluation of the draft report by an Evaluation Committee comprised of concerned experts and representatives of industry, academic and Government organizations, the report has been finalized by the Programme Division based on the suggestions of the Committee. The project is completed.

### *Study on Evaluating the application of Technology Management Assessment Procedure in foreign collaboration cases in Madhya Pradesh.*

With a view to study and evaluate the application of Technology Management Assessment in the foreign collaboration proposals approved and implemented in the State of Madhya Pradesh during the last several years, the study was taken up by Madhya Pradesh Consultancy Organization Ltd. (MPCON), Bhopal. After evaluation the draft report by the Evaluation Committee, the final report has been brought out and the project is completed. The focus of the study is to investigate application of TM tools and its effects on the business in terms of benefits in the form of increased market shares, improved corporate/brand/product image etc.

## 4.4 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 State of Uttar Pradesh were taken up in association with IIT, Kanpur. The objective was 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. After the evaluation of the draft report by an Evaluation Committee, the report has been brought out and the project is completed.

A case study relating to Kangra Tea to benefit the rural economy was taken up in association with IHBT, Palampur.

A case study on Selected Medicinal Plants from Minor Forest Produce Sahkari Samittee, Narmada Forest Nursery, Hoshangabad, TS Murthy Udyan Obaidullgang and Trader of Hoshangabad has been taken up in association with Technology Management Centre at Madhya Pradesh Council for Science & Technology at Bhopal. The survey work was in progress.

More case studies of different organizations in different sectors are in progress.

### **4.5 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, IIT Guwahati, IIT Kharagpur has progressed. Projects undertaken in partnership with other institutes, including IMI, New Delhi, IHBT, Palampur and others have also progressed.

### **4.6 Industry-Institute Networking with Industry Associations, State level Research and Other Agencies on Technology Management**

During the year, the Division has continued its interaction with several State level bodies across the country 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, NEITCO Guwahati, GITCO Ahmedabad, WEBCON Kolkata and CDC New Delhi, IED Patna, CII Gurgaon, FICCI New Delhi, Indian Council of Small Industries, Kolkata and Tamil Nadu Technology Development & Promotion Centre, Chennai.

### **4.7 Centres for Technology Management (CTM)**

Centres for Technology and Innovation Management have been set up by the Division 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 & Innovation Management at IHBT, Palampur in Himachal Pradesh***

With the objective of developing technology management capabilities in the State of



## DSIR Annual Report 2008-2009

Himachal Pradesh and adjoining areas to serve as a resource center, this Technology Management Centre is being set up at IHBT, Palampur in Himachal Pradesh. The project was assigned and the progress of the Centre was reviewed by the Project Review-cum-Guidance Committee. An extensive survey was taken up to assess the TM needs of the industry of the Kangra region in Himachal Pradesh as well as the need of herbal industry. A Workshop on TM Issues of Tea Industry in North West India was also organized. Preliminary technology needs of the floriculture industry have been assessed. The creation of data base as well as organization of short-term training programmes were under progress.

### ***Centre for Technology & Innovation Management at IED Patna, Bihar***

With the objective of developing technology management capabilities in the State of Bihar and to serve as a resource center, this Technology Management Centre is being set up at Institute of Entrepreneurship Development at Patna in Bihar. The Project Review-cum-Guidance Committee identified priority activities/ areas for the first year of implementation based on the need and relevance of the State of Bihar and accordingly work was initiated. The targets of the first year activities were achieved. 4 Short-term Training Programmes of 5 days duration were organized one each on Soya Manufacturing Technologies, Quality Management System, Tools and Technologies, Distillation Technologies for Aromatics and Mentha Oil and Low Cost Technology for Sanitary Napkins and a total of 135 trainees were trained, a 3-months training programme for 30 participants was organized on Agri-products Processing Technologies, 4 Technology Management Awareness Workshops were organized in which a total of 928 participants participated, in addition to complete and prepare on Diagnostic and Cluster Development study reports on Rice and Makhana Clusters. The portal development and publishing newsletter were also being implemented.

### ***Support to the existing Centre of Innovation & Technology Management at IMI, New Delhi***

With a view to develop technology management capabilities and create a greater awareness about Technology and Innovation Management, targeted training programme for trainers and awareness programme were supported at IMI, New Delhi to be carried out by the existing Centre for Innovation & Technology Management at the institute. Two workshops on Creation and Dissemination of Knowledge and a training programme on Interfacing Social Sciences with engineering and technical education were organized.

### ***Centre for Technology Management at IIT, Bombay***

Work has been undertaken as set of collaborative activities under an MOU with the School of Management at IIT Bombay. Phases I and II had been completed earlier. Under these phases, activities taken up included: Management Development Pro-grammes, Case Studies on TM aspects as well as research studies on contemporary TM issues, teaching of courses on specific TM aspects, bringing out of Newsletters on TM issues and development of a portal dedicated to TM. Phase III is on-going. Activities completed during the year include two Management Development Programmes on Technology, Innovation and R&D Management aspects for industry executives and one newsletter issue. A Programme Advisory cum Monitoring Committee has been set up and has met to assess and guide the on-going activities of the phase. Case studies of select organizations, augmentation of portal content, training of trainers programmes for academic and industry participants, management development programmes for industry executives and other activities were continued.

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

Phase-III has been completed during the year. Phases-I and II had earlier been completed. The



activities undertaken included several training programmes on different aspects of Technology and Innovation Management, case studies and surveys on technology issues in important local industry sectors. During Phase-III, activities completed include: development of a local data base of select industry SME units, three work studies and two case studies and organization of several workshops/seminars that include a 2-day workshop on Lean Manufacturing, an interactive programme on “How to license your technology?”, a one-day seminar on ISO/TS-16949 Automotive Standards, a programme on ‘Creating Leadership’, a China Orientation Certification programme, and an Innovators’ Expo. Other completed activities include publication of a booklet on Patent Procedures brought out in a simplified format for use by local industry, twelve issues of CTM newsletter, a Study on ‘Technology Upgradation in Pump Industry’, introduction of an elective course on Technology Management for II year PG students, a Survey on Common Modern Tool Room, preparation of audio visuals on technology management related aspects and augmentation of the content of the TM portal in operation. Some of the programmes and publications are in the vernacular medium, so that the local SME industry participants at various levels can also benefit from the Centre’s activities.

***Centre at Administrative Staff College of India, Hyderabad***

With the objective of building institutional capability in Technology Management, the Division has partnered the ASCI in initiating several activities. Four phases covering a range of activities that have evolved over a period of time; including case studies of manufacturing and research organizations, technology policy studies, and training programmes on various TM issues; had been completed. Activities of Phase-V currently underway comprise a comprehensive Technology Management Case Study on a specific industry, Case Studies on manufacturing Industrial and research organizations, Training Programmes on Technology Management

aspects, research publications and augmentation of the existing web enabled portal.

***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 undertaken. An audio visual programme on Technology management, covering initiatives under the MOU with KCTU, has been prepared. Activities currently underway include: studies on technology upgradation in select industry clusters of the State, training and human resource development, TM awareness programmes in targeted regions of the State, case studies on targeted specific clusters to benefit rural economy and publications on TM.

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

After successful completion of Phase-I activities under the Technology Management Centre, Phase-II activities were started. The activities proposed include need-based sectoral technology status, case studies, theme-oriented workshops on emerging issues concerning to TM, short-duration training programme on TM, bringing out quarterly newsletter, development of a portal on TM, scouting/troubleshooting services to the industries on TM aspects, etc. After identifying priority activities as suggested by the Project Review Committee, the work was taken up on the activities based on the need and relevance of the industry for the State of Madhya Pradesh in consultation with the State functionaries and organizations. The Centre has organized a workshop and an exhibition on Potential of Aromatic and Herbal Plants in the State of Madhya Pradesh, and a training programme on Quality Control of Herbal Medicines, in addition to a research and a case study on Medicinal Plants from Minor



Forest Produce Clusters in the State. The Centre started providing technical consultancy services to the industries.

Several new proposals for setting up of Technology & Innovation Management Centres were under consideration.

### 4.8 Support to DSIR Technology Management Chairs

Providing assistance to institutions in respect of education in technology management has been one of the focus areas of the Technology Management Division of this Department, since its very inception. The Division has worked with the Department of Education MHRD, AICTE and several academic institutes in the broad context of raising awareness, developing case studies and other pedagogic tools in this area. The Division has been interacting closely with academic institutes on several specific technology and innovation management issues and has also provided assistance in this direction for distance learning. Based on a survey carried out by the Division, which identified the important need for stepping up teaching and research in subjects pertaining to Technology & Innovation Management, a system for providing support to DSIR Technology Management Chairs in academic institutions has been initiated.

#### *DSIR Technology Management Chair at IIT Guwahati*

The DSIR Technology Management Chair has been supported at IIT Guwahati focusing on teaching and research activities in the area of Technology & Innovation Management. An MOU between DSIR and IIT Guwahati was signed spelling out the obligations and responsibilities as well as the activities to be carried out under the Chair. The work was under progress.

Proposals from universities, technology and management institutes, academic institutes and institutes of excellence seeking support towards DSIR TM Chairs were being processed.

### 4.9 Curriculum Development

An initiative towards curriculum development in Technology management had been launched by the Division. Preparation of five course modules was taken up as a first measure. Towards this, five specific modules had been prioritized, course coordinators for each of these had been identified and the tasks had been assigned. Each module in turn had been divided into twenty topics and specific topic writers had also been identified. The task of writing had been allocated. All the five course modules have been completed.

### 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, MAPCOST Bhopal and IED Patna.

#### *Portals for information dissemination*

Portals and other interactive media have been developed in association with ASCI Hyderabad, IIT Bombay, PSGIM Coimbatore, IED Patna, MPCOST Bhopal and other organizations and these are being continuously augmented to provide contemporary information on a periodic basis.



#### 4.11 Training/Interaction Meets/ Seminars/ Management Development Programmes

- Second National Workshop on Competitiveness in Emerging Industries was organized at IIT Delhi in association with IIT Delhi.
- 4, one-day Workshops on Concept of Technology & Innovation Management were organized at NIT, Patna, JD Women College, Patna and Bhagalpur Engineering College, Bhagalpur and L.N. Mishra Institute, Patna under Technology Management Centre by IED Patna, Bihar.
- 4 Management Development/Training Programmes of 5 days duration on Distillation Technology for Mentha Oil Producers, Soya Manufacturing Technology, Quality Management System, Tools and Technologies, Distillation Technology for Aromatic and Mentha Oil, and Low Cost Technology for Sanitary Napkins were organized 3 at Patna and one at Begusarai under Technology Management Centre by IED Patna, Bihar.
- 3-months Technology Management Training Programme on Agriproduct Processing Technologies was organized at Patna under Technology Management Centre by IED Patna, Bihar.
- 3-days' Executive Platform Course on Innovation and Technology Management was organized at Mumbai in association with CII, Gurgaon.
- 2-days Workshop on Intellectual Property Rights & Technology Management was organized at Kurukshetra in association with NIT, Kurukshetra.
- 2-days Workshop-cum-Exhibition on Technology Management in Aromatic and Herbal Plants was organized at Bhopal under Technology Management Centre by MP Council of Science & Technology, Bhopal.
- A training programme on Quality Control for Herbal Medicines was organized at Bhopal under Technology Management Centre by MP Council of Science & Technology, Bhopal.
- Workshop on Technology Management Issues of Tea Industry in North West India was organized at Palampur under Technology Management Centre by IHBT, Palampur.
- 2, three days Workshops on Creation and Dissemination of Knowledge were organized at New Delhi and Chandigarh under Technology Management Centre by IMI, New Delhi.
- A training programme on Interfacing Social Sciences with Engineering and Technical Education was organized at New Delhi under Technology Management Centre by IMI, New Delhi.
- 3 Technology Management programmes for targeted rural sectors were organized at Bangalore under Technology Management Centre by KCTU, Bangalore.
- Management Development Programme on Management of Technology and Innovation was organized at Mumbai under Technology Management Centre by IIT, Bombay.
- 2 R&D Management Programmes were organized at Mumbai under Technology Management Centre by IIT, Bombay.
- An International Conference on Medical Electronics was organized at New Delhi in association with FICCI, New Delhi.
- One-day Workshop on Potential of E-waste Management in India was organized in association with ELCINA, New Delhi.
- One day Workshop on Technological Interventions in Herbal, Natural, Medicinal, Ayurvedic Products was organized at Varanasi in association with Prof. S.N. Tripathi Memorial Foundation, Varanasi.