

IV. PUBLIC SECTOR ENTERPRISES

IV-A. National Research Development Corporation

1. INTRODUCTION

The National Research Development Corporation (NRDC) is a premier organisation, under the Department of Scientific & Industrial Research (DSIR), Ministry of Science & Technology, engaged in the development, promotion and commercialisation of the R&D results/ technologies emanating from Research Institutes/ Universities/ Industries, etc. The Corporation provides comprehensive technology transfer services and acts as a catalyst for transforming innovative research into marketable industrial products. NRDC is a unique organisation because it is the only public enterprise wholly dedicated to transfer of technologies from R&D laboratories to industry. During the past five decades of its existence, the Corporation has developed strong links and network with various R&D organisations in the country as well as abroad for transfer of technologies. Its operations cover the entire spectrum of industrial technologies ranging from chemicals to metallurgy, mechanical engineering, electrical engineering, electronics, biotechnology and so on.

The Corporation continued to maintain its good overall performance in all areas of its operations during the year 2007-08. During the year, the Corporation's income from its principal source of revenue i.e. Lumpsum Premia and Royalty on the licensing of technologies to industry was Rs.

419.29 lakhs, as compared to Rs 412.37 lakhs in the previous year.

The Income from Sales, Consultancy, Projects and Professional fee for domestic as well as export projects including other income has shown significant increase and is now Rs.463.33 lakhs which was only Rs.122.55 lakhs during the previous year.

2. PROFIT

A motivated strategic drive coupled with the dedication of officers and staff of the Corporation has resulted in an enhanced Surplus before Tax of Rs. 61.58 lakhs as compared to Rs. 33.76 lakhs in the previous year, an increase of 82.4%. Efforts are being made to clean up the non-performing assets of the Corporation by writing off the outstanding loans and equity provided to the licensee companies for development and commercialisation of technologies. Accordingly, during the year 2007-08, the Corporation had written off such loans and equity amounting to Rs. 54.17 lakhs.

The Gross Income of the Corporation from all sources, including premia and royalties, but excluding Grants-in-Aid, was Rs. 882.61 lakhs as compared to Rs. 534.91 lakhs in the previous year. The Department of Public Enterprises has given an 'Excellent' rating to the Corporation for its MOU performance during 2006-07 & 2007-08.

3. PROCESSES ASSIGNED

In order to widen the technology resource base, Corporation continued its efforts to identify new technology resources by nurturing long-term relationships with R&D laboratories, industries, universities, IITs, and individual inventors. As a result, 55 new processes were assigned to the Corporation for commercialisation in 2008-09 as compared to 58 processes in 2007-08. Some of the commercially important processes assigned to the Corporation are:

2007-08

- Semi solid processing of aluminum alloys
- Process for production of premium quality Aluminum alloy casting process
- Process for sol gel alumina abrasives
- Vacuum boiling cocoon equipment
- Metallic Buttons
- Hydrogel
- Nemagel
- Goat Pox Vaccine
- A Rapid immuno assay for serodiagnosis of IBD in Poultry Birds
- Multiple oil adjuvanted HS Vaccine
- High Pressure Sericulture Sprayer
- Seri Humidifier cum Heater
- Flat Silk
- Ferrocement Tanks and Grain Bins

2008-09

- Bio pesticide against white Grub
- Media for Mass Production of Bt
- Bio pesticide against Fungal pathogens
- Humic Acid
- Swine fever Vaccine
- Osmotic Dehydration of Apple and Apricot
- Evaporative Cooling Apparatus Resistant to Vector Breeding
- Modified hand operated maize sheller
- Recombinant blue tongue virus VP7 protein antigen based indirect ELISA for detection of BTV anti-bodies

- A rapid immunoassay for serodiagnosis of Infectious Bursal Disease (IBD) virus infection
- Recombinant antigen based ELISA for serodiagnosis of leptospirosis

4. MAJOR TECHNOLOGIES LICENSED

The impact of slower growth in the economies of the developed countries was visible in the Indian industry also during the year 2008-09 and there was mild slow down in the economic activity. Despite this trend, the Corporation managed to sign 35 licence agreements in 2008-09 as compared to 41 in 2007-08. Some of the major technologies licensed by the Corporation during the years were:

2007-08

- FMD vaccine
- Acido Whey
- Aonla Pricking machine
- Test kit for Microbiological quality Drinking Water
- Morizyme-b
- Hydrogel
- High Draft Kiln

2008-09

- Test Kit for Microbiological Quality Drinking Water
- Cocolawn
- 777 Oil



Fermenter for large scale production of Mosquito Larvicidal formulation of BT

- Analytical Process for detection of antibiotic residues in milk using bacterial spores as biosensors.
- Amruth - formulation for control of silkworm grasseries and flacherie disease.
- Hydrogel
- Bio-release fertilizer
- Bio-release multicomponent micronutrient fertiliser
- Mosquito Larvicidal Formulation of *Bacillus thuringiensis* Var *israelensis*
- Stable reduced azadirachtin and its formulations
- Evaporative Cooling Apparatus Resistant to vector Breeding

5. ROYALTY AGREEMENTS SIGNED BY THE CORPORATION FOR PROJECTS SUPPORTED BY DEPARTMENT OF SCIENTIFIC & INDUSTRIAL RESEARCH (DSIR)

DSIR has been supporting technology development projects under its "Technology Development and Demonstration Pro-gramme" (earlier known as Programme Aimed at Technological Self Reliance) involving industry, research institutes and consultants. The Corporation has been entrusted to manage all matters connected with the intellectual property rights generated in these projects, and also to collect the royalty revenues accruing from the utilisation of the technology by the Project Executing Company and also from third party licensing. The following major projects were undertaken during 2007-08 & 2008-09:

2007-08

- Dorzolamide HCL
- Dev. Of 90 KW Brushless clutch gear unit for radiator cooling fans in diesel electric locomotives of the Indian Railways
- Development of 1) A pentapeptide with natural Triterpenoid Conjugate 2) extraction

of pterostilbebe from pterocarpus Marsupium & Conversion to Resveratrol.

2008-09

- Glargine - A Human insulin analogue Process Improvement
- Development of small PV-Wind hybrid power Plant for rural application
- Development and demonstration of Process for manufacture of Hydrogel at pilot plant scale
- Dev. Of indigenous radiotherapy simulator (RTS) for radiation treatment of cancer

6. INTELLECTUAL PROPERTY RIGHTS (IPR) CONSULTANCY SERVICES

NRDC provides assistance for filing of patents in India and abroad to various Universities (more than 50) & technical institutions (more than 200) including the remotely located ones, and also to individual inventors etc. It also provides free international patent search to inventors and also conducts seminars and training programs for creating patent awareness in Industry Clusters, non-metropolitan cities, remotely located institutions as no other organization supports such endeavors.

During the year 2007-08 & 2008-09, Corporation continued to provide financial, technical and legal support to protect inventions and technologies developed by individual inventors, universities, R&D institutes & industries and has filed 76 patent applications each year in India in various sectors of technologies.

The Corporation has been catering to requests received from various R&D institutes and industries for conducting state-of-the art searches, the result of which is being utilized in many cases for submitting research projects or even initiating research projects at university level so that the project subject coverage should be novel and not a mere repetition of R&D work already done. This is in addition to the usage of

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these search results for filing patent application in India and abroad. During 2007-08 & 2008-09, 84 & 62 state-of-the art searches have been conducted on diverse fields, utilizing the databases like Derwent Patent Index provided under the services provided by Dialog.

The Corporation in its endeavour to spread the knowledge on various issues of IPR across the country has collaborated with various organizations and organized 15 & 17 seminars, workshops and training programmes in 2007-08 & 2008-09 in different parts of the country like Srinagar, Rahuri, Bhopal, Bhubaneswar, Silcher, Tezpur, Behrampur, Solan, Nainital, Pune, Coimbatore, Almora, Ranchi, Nainital, Roorkee, Solan, Jalandhar and Vishakhapatnam etc.

The Corporation has reached out to various R&D institutions and universities for educating intellectuals about the importance of protection of IP assets in the knowledge era by delivering lectures on focal areas of importance such as Patenting System in India, the Rationale of Protection of Geographical Indications of Goods, State-of-the art Searches, Trade Marks Registration Procedure, IP Valuation and Management, Agricultural Biotechnology and

many more. During 2007-08 & 2008-09 the corporation delivered 45 & 49 lectures in various institutes and remotely located universities.

7. PRIZE AWARD

National Research Development Corporation gives Tax Free Cash Awards for Meritorious Inventions to those in scientific and industrial fields which are proven to be workable, advantageous and commercially viable to encourage inventive talent in the country as these awards are given to the individuals and not to institutions and also WIPO Gold Medals for outstanding inventor and woman inventor respectively on behalf of World Intellectual Property Organisation (A Geneva Based UN subsystem). These NRDC awards and WIPO Medals are presented to awardees every year.

The Corporation continued to promote and encourage inventive talent amongst scientists, engineers, industrial workers and students by awarding prizes for meritorious inventions.

During 2007-08, the Corporation announced cash awards amounting to Rs. 5 lakhs for the following inventions:



IPR Seminar at Kota

- Design and Development of Pollution Free Cotton Seed Delinting Plant
- A High Performance Syntan for Eco-benign Chrome Tanning
- Anti-Scratch Coatings on Plastic Ophthalmic Lenses and Sheets using Inorganic-Organic Hybrid Nanocomposites
- Fault Current Limiter for LT Switchgear and Appliances
- Jhoola Pump

The Corporation also announced one WIPO Gold Medal for the best invention for the year 2006 to "Novel Process Technology for Removal of H₂S & Mercaptans from LPG through Continuous Film Contactor".

In January 2008 the prize award scheme have been classified in the following three categories:

Innovation Award of the Year 2008 (IP driven innovation, Premium Innovation and Innovation in high tech area) - Maximum amount of award is Rs. Five lakhs to be given to max. two inventions.

Societal Innovation Award of the Year 2008 (Agriculture, Environment, Rural) - Maximum amount of award is Rs. Three lakhs - to be given to max. three inventions.

Budding Innovators Award of the Year 2008 (Full time enrolled or registered students pursuing Bachelors, Masters or Doctoral degree program in Research Institutions, Universities, Affiliated Colleges - Maximum amount of award is Rs. One lakh to be given to max. five inventions.



Jhoola Pump

During 2008, Societal Innovation Award was given to Dr. Satya Nand Sush, Dr. Govindan Selvakumar, Dr. Uthugounder Mohan, Dr. Jagdish Chandra Bhatt and Dr. Hari Shanker Gupta of Vivekananda Parvatiya Krishi Anusandhan Sansthan, Almora for the development of "Eco-friendly novel technology for managing white grubs in north west Himalayas". Budding Innovators Award 2008 was given to Shri Rahul Katyal and Shri Mandeep Singh Sethi, BPT students of MM Institute of Physiotherapy & Rehabilitation, Mulana for the development of "THE CHARISMATIC CHAIR" and Shri Sudip Nag, Ph.D. Scholar, Deptt. of Electrical Engineering, IIT, Mumbai has been awarded for the design & development of "Silicon Locket for WEB Enabled Cardiac Diagnosis".

Two WIPO Awards for 2007 were presented (i) Dr. Vagish Shrinet & Dr. Mukesh K. Shah of Electrical Research & Development Association, Makarpura, Baroda for their invention "Design and Development of Fault current limiter for LT Switchgear and appliances" and (ii) WIPO gold medal for the best woman inventor for the year has been awarded to Dr. (Ms.) Mookandi Kanthimathi of CLRI, Chennai for her invention "A High performance polymeric syntan for Eco-benign chrome tranning".

Innovate India

Corporation organized its own Prize Award Function on 13-14th October, 2008 under the theme "Innovate India" which comprised of Prize Award Ceremony followed by Conference with the following objectives:



Prize Award Ceremony

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- Building brand equity for India as Innovative Technology Supplier
- Inducing, targeting and stimulating the inventive activity and technology development.
- Guidance and advice to individuals as well as companies involved in R&D
- Support and steer in commercialization of awarded inventions.
- Networking with research institutions and entrepreneurs in the field of inventions and technology transfer
- Publicize awarded inventions through associated exhibitions, mailers, posters and networking.
- Showcasing innovative technologies
- Popularization and dissemination of inventive work.

NRDC provided a platform to NGOs and other agencies involved in rural development during conference on "Leveraging Innovations & Inventions: Enhancing Competitiveness" during October 13 - 14, 2008 at India Habitat Centre, New Delhi to exchange ideas and share their experience and launched I3 Forum (Idea, Innovation and incubation).

In the interactive session of the I3 Forum, project proposals on Rural and Food Processing Technologies from NGOs and other agencies involved in rural development were invited for the consideration of the project support upto Rs.1.0 Lakh. Ten proposals selected for the support based on the credibility of the



organization, innovativeness, commercial viability, initiatives taken and need of the area.

8. ANGEL FUNDING - BY WAY OF EQUITY

During the F.Y. 2007-08, the Corporation executed MOU with the Incubators at IIT Madras, IIT Bombay and KIET Ghaziabad. The Investment Committee after viewing the presentation and discussions with the incubatee's, recommended for equity participation. Accordingly, the amount of Rs.30 lakhs was released to M/s. Rope Enterprises.

During 2008-09 the Corporation has disbursed of Rs.30 lakhs as equity to M/s. Uniphore Software Systems Pvt. Ltd. and Investment Agreement has been signed. VoiceNet, a product of Uniphore Technologies has the potential for phenomenal reach due to its natural interaction mechanisms using personalized information delivery in a conversational medium. The architecture and system design of VoiceNet allows it to use inaccurate and present -day speech recognition technologies as it is, and make it useable, and accurate.

9. DEVELOPMENT & PROMOTION OF RURAL & HOUSEHOLD TECHNOLOGY

The Corporation continued to pursue its programme of Development and Promotion of Rural and Household Technology to use modern science and technology for the following objectives:

- To improve the living conditions of people in rural areas
- To generate employment opportunities in rural areas
- To upgrade the traditional skills, and
- To improve rural sanitation and health care.

Under this programme, the Corporation is making concerted efforts to create employment opportunities in rural areas by way of capacity

building of local NGOs and other developmental agencies through technological intervention. Dissemination of information on rural technologies and its popularization by way of arranging training programme in rural areas and participation in exhibitions, seminars / conferences etc. is an ongoing activity of the Corporation.

During the financial year 2007-08, the Corporation strengthened 7 existing Centres manned by local NGO's in different parts of the country and networked with 2 new NGOs viz., Surya Seva Samasthe, Chamarajanagar (Karnataka) and HIMCON (Himalayan Consortium for Himalayan Conservation) Tehri Garhwal on area specific technologies. Training programmes on fruits and vegetable dehydration, live stock development, blue green algae, soya and biofuel processing, coir retting and electronics design upgradation were conducted in collaboration with our counterpart agencies which enabled the Corporation to reach to more than 5000 beneficiaries.

During the financial year 2008-09, the Corporation strengthened 10 existing Centres manned by local NGO's in different parts of the country and has set up 2 new centres viz.,

- (1) Centre for Social Reconstruction at Nagercoil - Training on Palm Candy Project is in progress
- (2) Bihar Aromatic plants growers association, Patna - Projects to be implemented are being identified based on the locally available raw material.

10. RURAL CLUSTERS

To identify the technological gaps & to add value to the end products the Corporation has identified three clusters which are:

- (1) Dairy Cluster
 - Specific problems were identified in the area of processing, packaging, increasing shelf life of khoa, Pedda of Mathura, milk cake of Alwar and milk storing. In order to providing solutions to the problems identified, scientists from NDRI were contacted.
 - Organised 2 cluster meets at Muzafarnagar and Saharanpur
 - Training program at NDRI Karnal for production of quality products to Alwar Halwais



NRDC Farm Field School

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- Interactive meet conducted at Meerut
- (2) Sericulture Cluster
 - 131 sericulture farmers have been trained at CSR&TI, Mysore on the advanced methods of silkworm rearing inhouse
 - Corporation provided support for the establishment of Commercial Chawki Reading Centre in the Sericulture Cluster Region of Kanakapura Taluk for the supply of quality silkworm chawki to the sericulture farmers
 - Corporation started NRDC Farm Field School for facilitation of farmer-to farmer training and demonstration of improved technologies and we are getting good response in terms of participation and healthy interaction by the sericulture farmers.

(3) Coir Cluster

Coir cluster is the most important sector in the coconut growing areas but unfortunately the clusters are still practicing traditional technologies and old looms for processing of fibre. Corporation provided financial support for distributing and installing of four Anupam Looms through CCRI, Alleppy. These looms have a basic advantage of high productivity and higher efficiency as compared to the traditional looms.

11. EXHIBITIONS AND PUBLICITY

Trade fairs and exhibitions have some unique advantage over the sales promotion techniques. Corporation has been participating / organizing exhibitions, get-togethers, workshops, trade fairs etc. to provide information on indigenous technologies to industry. With this end in view, the Corporation participated in exhibitions, seminars and get-togethers in India and abroad organised by various agencies as detailed below:

2007-08

- International Bio-Expo, Tokyo, Japan
- India Fair, Melbourne, Australia

- SFD, SME Expo, Cairo, Egypt
- SME Export, Rwanda
- Agri Conclave, Jhalawar, Rajasthan
- 2nd Horti Food Expo, Shillong
- Bio-Expo, Bangalore
- Indian Animals Industry Expo-2007, New Delhi
- Food Technology Expo, New Delhi
- International Food Processing, Jaipur
- 11th National Expo on Science, Kolkata
- Agrovision, Nagpur
- Innovate India, New Delhi
- Arogya, New Delhi
- Life Sciences, Hyderabad
- Pashu Mela, Izatnagar
- IITF, New Delhi
- Kisan Mela, Midnapore, West Bengal
- APCHNE 2008, New Delhi
- Jaipur Infrastructure, Jaipur
- Innovative Technologies for Manufacturing, Mumbai



International Bio-Expo, Tokyo, Japan

2008-09

Corporation participated in 27 exhibitions out of which 10 were organized in rural sector and 4 International exhibitions. Partial list of the exhibitions participated by the Corporation are:

- Herbal International, New Delhi
- Bio Expo, Bangalore
- Modern Machine shop 2008, New Delhi
- 6th Infra Education 2008, Gwalior
- International Bio-Expo, Tokyo
- Multi-Dimensional Expo, Mewar
- Mumbai Tech Expo, Mumbai
- Rwanda International Trade fair, Rwanda
- Agro Protech, Kolkata
- Animal Science, Cairo
- India Chem, Mumbai
- Asian Innovation Expo, China
- MahaBio, Pune
- Indian Science Congress, Shillong
- Destination Uttarakhand, Dehradun

12. PUBLICATIONS

Dissemination of information on new processes to industry, entrepreneurs and the general public plays an important role in the process of technology transfer. One of the means of doing so is through publications of various types. During the year, the Corporation continued to bring out the regular publications Awishkar (Monthly in Hindi) and Invention Intelligence (Bi-monthly in English). The Corporation has brought out 5 special publications in 2007-08 and 10 special publications in 2008-09 and some of them are as below:

2007-08

- (i) Docket on Bio Technology
- (ii) Booklet on green technologies for sustainable agriculture and
- (iii) Docket on Agriculture Technologies
- (iv) Souvenir on Innovate India
- (v) Annual Report

2008-09

- (i) Preliminary Technical Notes (PTN) Docket with 13 technology leaflets

- (ii) Brochure on Life Sciences
- (iii) Docket on Appropriate Technologies from NRDC with 9 leaflets for Africa Conclave (in English and French)
- (iv) Docket on Appropriate Technologies from NRDC with 14 leaflets for Rwanda Exhibition
- (v) Folder for Innovate India, "Leveraging Innovations and Inventions", Nurturing technological Inventions and Innovations, Inspiring Innovations for Technological Leadership
- (vi) Souvenir on Leveraging Innovations and Inventions
- (vii) Success Stories of Awarded Inventions
- (viii) Inspiring Innovations for Technological Leadership

13. MARKET SURVEYS

Conducting market survey for the assigned technologies help to gather vital information about current market trends, customers, competitors, and potential areas of growth, enterprises around the country / world etc. Market survey for a technology is the key factor to get advantage over competitors in market. The survey provides important information to identify and analyze the market need, market size and competition. Industry analysis & business research is helpful in decision making for launching new products in market.

The Corporation carried out Market surveys for the following:

2007-08

- Long Delay Phosphor
- Hydrogel
- Availability of Neem Seeds in India
- Nested PCR Technologies for TB Detection
- Thermo Stable ELISA Kits
- Sericulture Technologies
- Silver Tin Oxide/Tungsten Oxide Electrical Contacts

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- Polymeric Blend for Domestic Switches
- Plant Based Larvicide
- Biopesticides-with Special reference to Trichoderma
- Liquid Biofertilisers

2008-09

- Swine Fever Virus Cell Culture Vaccine
- Management of White Grubs
- Bio-pesticidal Nemagel
- leptosporosis Detection Kit
- Mosquito Larvicidal Formulation Based BACILLUS THRINGIENSIS VAR ISRAELENSIS
- Biocontrol Agent against Trichoderma

14. TECHNOLOGY AND PROJECT EXPORT

The Corporation continued its concerted and energetic efforts to export Indian Technologies to other developing countries. In doing so, the Corporation is not only banking on the technologies available from its own reservoir, but also drawing on proven, operating, technologies in both Public and Private Industry. During the year several delegations from other developing countries were received and the Corporation was able to generate interest of major international companies in indigenous technologies. Strategic alliances have been made with local consultants in the countries of potential business to secure business in those countries. A few such Memorandum of Understanding and Memorandum of Agreement signed are listed below:

2007-08

- M/s. Interface Network, Dakar Senegal for setting up of Agro Industrial Centre at Senegal
- M/s. Linkseas Trading Co. Ltd., Taipei, Taiwan
- M/s. BIECC, Abidjan for financing of technology/ project licensed by NRDC

- M/s. Sunramy Company Ltd. for licensing of Indian technologies in Japan

2008-09

- M/s MHCI, Cote 'd ivoire for supply of P&M for Honey Processing
- M/s Malaysian Biotechnology Corpora-tion for transfer of technology in the field of Biotechnology
- Management Training Institute, Ministry of S&T, Govt. of Vietnam for HR development in field of Technology Transfer
- Chamber of Commerce, Government of Burkina Faso for setting up of Democentre
- Memorandum of Agreement with the Government of Republic of Benin for setting up of democentre

15. FOREIGN EXCHANGE EARNINGS

The foreign exchange earnings of the Corporation amounted to Rs.3.13 lakhs in 2007-08 and Rs. 54.55 lakhs in 2008-09 .

16. DEMONSTRATION CENTRE OF SMALL AND MICRO MACHINERIES IN IVORY COAST

The Corporation with an objective to promote Indian technologies & machines suitable in West African Countries has setup a Centre for Demonstration and Promotion of Technologies at



Inauguration of the centre

Abidjan, Ivory Coast, with funding from Ministry of External Affairs (MEA). The Corporation dispatched various machines identified for the Centre. All the machines have been installed, fully refurbished, tested and sample products made.

The Centre was inaugurated by Hon'ble Minister of State for External Affairs, Republic of India Mr. Anand Sharma under the patronage of Hon'ble President of Cote d'Ivoire, who was represented by Hon'ble Foreign Minister of Republic of Cote d'Ivoire Mr. Youssouf Bakayoko.

The programme was co-chaired by Hon'ble Minister of Agriculture of Republic of Cote d'Ivoire Mr. Amadou Gbon Coulibaly.

17. KNOWLEDGE MANAGEMENT SYSTEM (KMS) FOR TECHNOLOGY PROMOTION

The Corporation, during the financial year 2004-05, has introduced the Knowledge Management System for promotion, development and commercialisation of indigenous technologies. It is a self-propelled mechanism for systematic evaluation of the technologies, by a team of experts for value addition to the extent possible for making a complete technology package for setting up commercial plant, so that the chances of its success become high. Three expert Panels in the area of Biotechnology, agriculture and Ayurveda & Herbal have been formed.

2007-08

Forty two new technologies were discussed for value addition.

2008-09

Thirty seven new technologies were discussed in 9 meetings & 4 seminars, interactive meets & university-industry get-togethers.

18. BASIC ENGINEERING DESIGN PACKAGE (BEDP)

The major objectives of the activity are to

provide value-addition to the promising technologies for quick and effective utilisation of the technology so developed and also to instil confidence amongst the entrepreneurs. BEDP also provides deeper insight and clarity regarding the workability of the technology

The package developed would contain:

- Design Basis
- Block flow diagram for the process
- Process description
- List of equipments
- List of instruments
- PDS for equipments
- PDS for Instruments
- PFD's for the Process
- P&ID for the Process

BEDP Packages developed in 2007-08 are:

- Goat pox vaccine
- Herbal Lipstick
- Re-refining of used engine oil
- Low Cholesterol Ghee
- Long shelf life Paneer
- Mozzarella Cheese

Twelve BEDP Packages were developed in 2008-09 which are as follows:

- Herbal Health Drink
- Nested PCR (Polymerase Chain Reaction) technology for TB detection
- Swine fever virus cell culture vaccine
- Humic Acid
- Bio-diesel
- CATSOL
- Herbal Ghee
- Azadirachtin Extraction
- Micro-nutrient Zinc Fertiliser

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- Cassava Starch
- Fruit Processing (Pineapple)
- Hydrogel

19. TECHNOLOGY DEVELOPMENT PROGRAM FOR PRIORITY PROJECTS

The Corporation has been promoting and financing in collaboration with industry and R&D institutes, technology development projects for further development, setting up pilot, semi-commercial or demonstration plants. The progress on the major technology development projects is given below:

2007-08

Completed Projects

- In-vivo evaluation and further development work on Targeted Gene Delivery System

The know-how for virosome based Targeted Gene Delivery System, a platform technology, was developed by University of Delhi. It is highly target (liver cell) specific and has a strong potential to develop various therapeutics for a number of diseases originating from liver cells- Hepatitis, Liver cancer, Hemophilia, Malaria, etc. This process know-how has a very good opportunity for licensing in other countries.

On-going:

- Optimization of New Anti-Cancer Formulation using Methylglyoxal as a lead compound

An anti-cancer formulation using Methylglyoxal as a lead compound for the treatment of cancer has been developed by Indian Association for the Cultivation of Science, Kolkata. The formulation has broad applications and it can cover many aspects using imino acid conjugates of methylglyoxal. Methylglyoxal acts selectively against malignant cells. Its effects can be significantly augmented with natural compounds, ascorbic acid and other vitamins. Methylglyoxal is a potent anti-cancer agent through both in-vitro

and in-vivo routes. The work is expected to be completed in 2008-09.

New Projects Taken-up:

- Bio assay Efficacy Test for the Process 'Plant Based Larvicide'
- Development of a Dip Coating Sol Gel on Ophthalmic Lenses

2008-09

Completed Projects

Optimization of New Anti-Cancer Formulation using Methylglyoxal as a lead compound

Ongoing Projects:

- Bio assay Efficacy Test for the Process 'Plant Based Larvicide'
- Development of a Dip Coating Sol Gel on Ophthalmic Lenses

New Projects Taken-up:

- Development of Bamboo Timbers (initiated & completed in 2008-09)
- Generating Field Efficacy Data on Super absorbent hydrogel
- Generating Field Efficacy Data on Biopesticide Nemagel
- Generating Field Efficacy Data on Novel Composition of Biocontrol
- Generating Filed Efficacy Data on Novel Organic Seed Protestants

Program for North Eastern States

In technology development special emphasis is being focused on food, housing and industry. In order to make itself more visible in the North-Eastern region, the Corporation has identified areas requiring technological intervention. In particular, stress is being laid on :

- Carpet Weaving
- Agro-Horticulture
- Promotion of Organic farming in NE

During the year Corporation organized the following motivation programmes/ Projects:

S.No.	Programmes/Projects	Date
1.	Provided 500 Solar Lantern to Mizoram Intodelhna Programme for distribution to villages in Mizoram	June 2008
2.	One day Awareness-cum-Motivational programme on Driving for Self Employment at Imphal, Manipur	Sept. 2008
3.	Technology Intervention in the process of manufacturing Bamboo Timber Composites	Project completed
4.	One day Awareness-cum-Motivational programme on Driving for Self Employment at Itanagar, Arunachal Pradesh	October 2008
5.	One day Awareness-cum-Motivational programme on Driving for Self Employment at Tripura, Agartala	November 2008
6.	Installation of a solar drier for drying cardamon at SMIT, Rangpo, Sikkim	November 2008
7.	Need for Technology and its assessment for economic resurgence of North Eastern States	Draft report under study
8.	Training on fruit coating for shelf life extension in Nagaland	Training completed
9.	Pilot Plant for Turmeric Processing in Mizoram	Grant assistance sanctioned by NABARD of Rs.19.76 lakhs
10.	Solar Drying of turmeric at Mizoram	ZEDA, Mizoram has entrusted the Corporation for installation of 20 modules of Solar Dryer for drying of Turmeric. Meanwhile, against the advance of Rs 80 lakhs received from ZEDA, the Corporation has placed the order for installation of 6 modules, which have reached Mizoram and installation is in progress.
11.	EDP conducted in food Processing in Meghalaya	Completed

Women Entrepreneurship Development Program

(i) Promoting Entrepreneurship amongst college students

WEDP is being carried out by the Corporation to promote, inspire, and encourage women to take up entrepreneurship. This is being achieved by disseminating information on appropriate technologies through various sensitization programs, lectures, seminars, workshops conducted at various locations. These programs

provide project based information on raw material, plant & machinery, their availability & approx. cost of the project which will be helpful in making decisions regarding taking up the project.

14 such programs for promotion of entrepreneurship amongst women were conducted at various Universities. Some of them are Bharathiar University, Coimbatore, Avinashilingam University for Women, Coimbatore, Bharathidasan University,

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Tiruchirappalli, Alagappa University, Karaikudi, Mother Teresa Women's University, Kodaikanal, Gandhigram Rural University, Periyar Maniyammai University, Gandhigram, RTM Nagpur University, Nagpur, Andhra University, Visakhapatnam, Manonmaniam Sundaranar University, Tirunelveli, MOP Vaishnav College for Women, Chennai, S.P. Mahila Visvavidyalaya, Tirupathi

(ii) Sericulture for Women

NRDC under the Women Entrepreneurship Development Program has initiated a program for mass production of biocontrol agents with M/s.Kaveri Mahila Reshmi Belegarara Gunatmaka Sangha, Bommanadoddi Village, Maddur Taluk, Mandya district which is a Self Help Group of rural women.

This NGO is involved in mass production of biocontrol agents for the control of sericulture pests like uzi fly and mealy bugs. The program involves training in the techniques of production and release of *Nesolynx thymus* and *Scymnus coccivora* to control uzi fly and mealy bugs which are the major pests of sericulture and mulberry causing considerable damages to the silkworm crops and mulberry gardens. All the necessary training that is required along with the technical infrastructure was provided by NRDC which has resulted in reduction of pest incidence and crop loss to sericulturists in 25 villages of Maddur taluk.



Women Entrepreneurship Development Programme

(iii) Pollution free processing of coir fibre

During the extraction process of husk from coconut, defibreing machines are used. The fibre is found to be harsh in feel and has to pass through the fingers of women workers. But the new process developed is eco-friendly, does not generate effluent and the machines can be easily operated by women. The process yields good quality coir yarn with more output and texture and with zero effluent.

The Corporation is providing 35 nos. of such units to various cooperatives of the region.

20. HUMAN RESOURCE

The real asset of any company is its human resource. The total manpower of the Corporation as on 31st March 2008 was 95 viz. (Group A-31, Group B-37, Group C-21 and Group D-6) and as on 31st March 2009 was 91 viz. (Group A-29, Group B-35, Group C-21 and Group D-6). The employee-management relationship was cordial throughout the year. The real asset of any company is its human resource. The employee-management relationship was cordial throughout the year.

During the years under review, there were no employees receiving remuneration of or in excess of Rs.24 lakhs per annum or Rs.2,00,000 per month, requiring disclosure as per the Provisions of Section 217(2A) read with the Companies (Particulars of Employees) Rules 1975.

21. HUMAN RESOURCE DEVELOPMENT

Training and development at all levels of employees was given due priority by the Corporation to increase effectiveness. Special emphasis was given to organisation building and shaping right attitudes, team building and work culture, besides preparing employees to understand the trends in fast changing technology and switching over to latest technology for achieving higher results in productivity and profitability. During 2007-08 &

2008-09, 55 & 45 executives of the Corporation were deputed to various training programmes to further develop their skill in various areas of management, communication, vigilance and advancement of technology.

The thrust for better utilisation of Human Resource and improvement in work practice continued during the year.

22. TECHNOLOGY ABSORPTION, ADAPTATION AND INNOVATION

While a major objective of the corporation is the development and commercialisation of indigenous technology, the Corporation itself does not carry out any R&D. However, it promotes and finances R&D on a selective basis in both laboratories and industry. Hence the requirement to furnish information in respect of Technology Absorption, Adaptation and Innovation under Rule 2(B) of Companies (Disclosure of Particulars in the Report of Board of Directors) Rules, 1988, is not applicable to the Corporation.

23. IMPLEMENTATION OF OFFICIAL LANGUAGE

The Corporation continued to make efforts to fulfil the targets prescribed by Govt. of India in the Official Language Act and Rules framed there in with regard to increase the use of Hindi Rajbhasha in office during the year 2008-09. Employees were motivated to use their working knowledge of Hindi in day-to-day official work. All the Standard Forms, Files, etc are bilingual. Significant progress has been made in the field of correspondence, noting and drafting in Hindi. All Hindi letters are being replied in Hindi only. The Annual Report of the Corporation is being published in diglot form in both Hindi & English since 1986-87. The Corporation also publishes a popular Science & Technology monthly magazine in Hindi, entitled 'Awishkar'. To enrich Hindi vocabulary of the employees of the Corporation as well as visitors, an English word with its Hindi meaning is written daily on a writing board as 'Today's word' at the reception of the Corporation. To popularise the use of Hindi, the Corporation organised a Hindi Workshop. During the workshop, information was given regarding Official Language Act, Rules, and drafting & noting.