

## **PUBLIC SECTOR ENTERPRISES**

- 1: NATIONAL RESEARCH DEVELOPMENT CORPORATION (NRDC)**
- 2: CENTRAL ELECTRONICS LIMITED (CEL)**



# 1 NATIONAL RESEARCH DEVELOPMENT CORPORATION (NRDC)

## 1.1. Introduction

National Research Development Corporation (NRDC) is a Government of India enterprise, under the Administrative control of Department of Scientific & Industrial Research (DSIR), established in 1953 under section 25 now section 8, of the companies act. The main objective is to promote, develop and commercialize technologies/ know how/ inventions/ patents/ processes emanating from various national R&D institutions. The Corporation offers its services through-out the country in improving the Nation’s manufacturing base with innovative technologies specially suitable for our entrepreneurs and conditions. It acts as an effective Interface for translating R&D results into marketable products. Over the last more than six decades of its existence, the Corporation has forged strong links with various R&D organizations both within the country and abroad and pursued bringing inventions and innovations to commercial fruition. The Corporation is recognized as a repository of a wide range of technologies and has licensed technologies to over 5000 entrepreneurs spread over almost all areas of industry and has provided assistance for filing of 1800 patents.

During the year, NRDC received various awards and recognitions:

- NRDC received the Global Agriculture Leadership Award of ICFA 2018 Under Research & Development Category from Sh Rajnath Singh Hon’ble Union Home Minister, Govt of India.
- NRDC received the Institution of Engineers India (IEI) Industry Excellence

Award 2018 for demonstrating highest order of Industry Business Excellence.

- Awarded the Governance Now PSU Award for its “*excellent outreach communication efforts to its Stakeholders*”



NRDC Received the Global Agriculture Leadership Award of ICFA

## 1.2. Profit

The highlights of the performance and the financial result for the financial year ended 31<sup>st</sup> March 2019 are given below:

Rs Lacs

Performance Parameters	2018-19	2017-18
Gross Income	1112.86*	1133.03
Revenue from Operations	1064.00	1074.24
Other Income	48.86	58.79
Profit Before tax	2.85	62.29
Paid up Share Capital	441.81	441.81
Reserves & Surplus	502.38	501.38
Net Worth	944.19	943.19

\* As per the pre-revised Accounting Policy of the Corporation, the Gross Income for the financial year under report is ₹ 2023 lakhs



### 1.3. Processes Assigned And Licence Agreements Concluded

The Corporation continued to lay emphasis on broadening and strengthening the technology resource base by nurturing long-term relationships with R&D institutions as well as universities, technical organizations, industries and also individual inventors. This endeavour is reflected in the Corporation's signing of 52 MOUs/MOAs/Agreements with Institutions/Organizations for intellectual property protection, technology commercialization, technology consultation and other value-added services. Some of the major institutions are as under:

1. Indian Oil Corporation Ltd. (IOCL)
2. Tribal Co-operative marketing development federation of India Ltd. (TRIFED), New Delhi
3. Guwahati university
4. S.N Bose Centre For Basic Sciences
5. Indian Institute of Technology (IIT), Nangal Road, Punjab
6. NIT, Kanpur
7. Bharat Dynamics Ltd, Hyderabad
8. Intellectual Property Management Cell, Jawaharlal Nehru University, New Mehrauli Road, New Delhi

During the financial year 109 new processes/ technologies were assigned to the Corporation for licensing, (List enclosed as **Annexure - 13**). Some of the commercially important processes assigned to the Corporation from various research institutes, universities were:

#### National Institute of Ocean Technology (NIOT)

1. Robocoastal observer
2. Remotely Operated Vehicle (ROV)

3. Wireless Expandable Bathythermograph Conductivity Temperature and Depth Profile System (WXCTD)

#### IOCL-R&D, Faridabad

1. A process for the removal of metals from vegetable oils & animal fats
2. Multi utility solar led lighting device
3. Novel catalyst composition for biodiesel production and a process for producing biodiesel and the product thereof

#### IISR, Kozhikode

1. A novel method of storing and delivering PGPR / microbes through biocapsule
2. A seed coating composition and a process for its preparation
3. A micronutrient composition for ginger and a process for its preparation (for soils with pH above 7)

#### Major Technologies Licensed

As a result of Value addition, the Corporation managed to sign 22 license agreements (enclosed as **Annexure-14**) during the year compared to 35 license agreements signed last year. Some of the major processes / technologies licensed by the Corporation in the financial year were:

#### VCRC (ICMR)

1. Bti Larvicide

#### S. N. Bose National Centre for Basic Sciences

1. Non-Invasive Kit to detect Haemoglobin
2. Non-invasive quantitative estimation of Billirubin & oxygen content in human body

#### CSIR-NPL

1. Recycling of Waste Plastic Bags into useful tiles

### **Lumpsum Premia and Royalty**

The consolidated Lump sum Premia & Royalty income is 910.69 Lakhs as compared to Rs. 893.28 lakhs in the previous year.

### **1.4. Consultancy/Export of Projects And Services**

The Corporation has been offering consultancy services in the following fields:

- Technological upgradation for the SMEs – identify technological gaps, scouting for appropriate technology and partnering with R&D institute for developing the solution
- IP Consultancy services – Patent Datamining, Search and Analysis, Patent drafting, filing and prosecution, Patent landscaping, FTO analysis, IPR policy, Audit, Training.
- Project consultancy – undertaking and executing projects in India and abroad particularly in developing countries.
- The Consultancy fee earned in the Financial Year 2018-19 is Rs.153.32 lakhs against the last year amount of Rs.180.97 lakhs.

### **Export of Technologies and Services**

The Corporation has endeavoured with great zeal for export of technologies, and services and securing project. In addition, the lead generated earlier was also pursued for securing Turnkey projects.

The corporation had earlier signed MOU with Tanzania Industrial Research and Development Organisation (TIRDO) for setting up of Technology Demonstration Centre. A team from NRDC had visited Tanzania and had discussion with TIRDO to

proceed further with preparation of project proposal for the centre. The corporation also proposes to sign MOU with CNRST Morocco for setting up of technology transfer and demonstration centre. The corporation has also signed MOU with Afro India Technology and Societal Transformation Foundation (AITST) Mauritius for carrying out survey to identify crops that could be cultivated in Zambia and recommending appropriate Technologies. NRDC team also visited Ghana after signing MOU with Good Earth Global Limited, Accra for providing consultancy services for identifying crops suitable for their region.

A number of delegation visited the corporation from USA and Morocco etc. and expressed to enter MOU for technical cooperation. Keeping in view the above, it is expected that the corporation may procure projects overseas to set up framework for export of technologies.

### **MoA/MoU signed with foreign countries**

- i) Afro-India Technology and Social Transformation Foundation (AITST), Mauritius for providing consultancy for carrying out survey and preparing report for cultivation, storage and processing of various crops in Zambia.
- ii) Hong Kong Trade Development Council (HKTDC) for strategic partnership to facilitate Business Matching Services, IP Commercialisation for mutual benefit.
- iii) Tanzania Industrial Research and Development Organisation (TIRDO) for setting up Technology Demonstration Centre
- iv) The Indonesian Institute of Sciences for technology transfer exchange and marketing of technologies.



### **Lead generated for signing of MoU / MoA**

New Jersey Economic Development Authority and Rowan University, New Jersey for technical cooperation and technology transfer.

University of South Bohemia, Czech Republic for Technical Cooperation and Technology Transfer

National Centre for Scientific and Technological Research, Morocco for setting up Technology Transfer and Demonstration Centre.

Iran National Innovation Fund, Iran for Technical cooperation and Technology Transfer

Wevio Global Inc, South Korea for Technical Cooperation and Technology Transfer

### **Foreign Delegation visited NRDC**

Delegation from Municipality of Almirante Brown, Argentina visited on 17th April, 2018 for technical co-operation and signing of MOU

Delegation from India China Trade Centre, visited on 15th May, 2018 for technical co-operation

H.E. Mr. Sainy Tiemele Ambassador Embassy of the Republic of Cote d'Ivoire (Ivory Coast) visited on 30th July, 2018 for discussion on the project for setting Cashew nut processing plant in Cote d'Ivoire

Delegation from Centre National de la Recherche Scientifique et Technique (National Centre for Scientific and Technological Research) (CNRST), Morocco, headed by Dr. Mohamed Khalfaoui, Director visited on 9th October, 2018 for technical co-operation for setting up of technology transfer and demonstration centre.

Dr. F. A. Uriarte, Former Minister of Science and Technology, Philippines and Mr.

Krishnan Srinivasraghavan of UN APCTT on 10th October, 2018 for Collaboration on Technology Transfer

Delegation of ASEAN countries visited on 30th Nov. 2018

Mr. Calvin Yi, President and CEO of Wevio Global Inc., South Korea visited on 10th December for Technical Co-operation and technology transfer

H.E. Domingo Mba Esono, Vice-minister of Commerce and SME Promotion of Small and Medium Enterprises, Republic of Equatorial Guinea visited on 20th March, 2019 for technical co-operation for Technology Demonstration Centre for SME development Team of UNESCAP visited NRDC

### **START-UP INDIA INITIATIVE**

#### **Assessment of start-up-india applications for tax-exemption**

“Start-up-India” is an initiative of Department of Industrial Policy and Promotion (DIPP), Government of India, designed for fostering innovations, create jobs and facilitate investments. Start-up India receives applications from all over India for getting recognition (as Start-ups) for further availing proposed benefits under this scheme including the three year tax benefits.

DIPP has given the responsibility to NRDC for technically assessing these applications for recognizing start-ups and recommending the eligible start-ups for tax exemption and other benefits. Till date total 20859 start-ups have been successfully received the recognition certificate. As notified, for further availing tax benefits, the eligible applications are further reviewed by an Inter-Ministerial Board (IMB) chaired by JS, DIPP. NRDC evaluates the applications on the basis of norms given by Start-Up India initiative and submit the reports regarding the same



to Inter Ministerial Board (IMB) for final decision. NRDC has submitted report for more than 1800 cases up to 29th IMB meeting. Based on the recommendation of assessment by NRDC the IMB has approved about than 94 start-ups for availing tax benefits.

### **Implementation of IOCL Start-up Scheme**

National Research Development Corporation (NRDC) New Delhi, signed a MoA with IOCL for mentoring and monitoring the 11 start-ups for first tranche of funding, and 13 StartUps in second tranche respectively on 21st September 2017 and 30th March 2019. The role of NRDC as per the MoA is to mentor, incubate, monitor, evaluate and review the Start-up projects selected under the scheme and to provide inputs and assistance to validate the Idea/project till proof of concept stage, and to recommend the release of funds based on milestones agreed. IOCL is paying 2.96 Crores + applicable GST to NRDC for providing the above services.

### **Pilot Incubation Centre at NRDC**

As approved in 241st meeting of the Board of Directors of NRDC held at New Delhi on 15th December 2017, NRDC, established a Pilot Incubation Centre at NRDC in order to leverage the Start-up innovation ecosystem by utilising the vacant space of erstwhile TTFC into a new Incubation Centre, which can accommodate/ incubate about 9-10 start-ups.

After examining the applications of start-ups, NRDC has incubated three start-ups.

The Corporation has physically incubated two start-ups:

M/s Realsaber Technologies Pvt. Ltd.,  
New Delhi

M/s Pratyaksha Agrotech Pvt Ltd, New  
Delhi

The Corporation has virtually incubated one start-ups:

M/s Klassical Biomechanics International  
LLP, Gurgaon

Managing CSIR-CEERI, Pilani Incubation

NRDC entered into an agreement with CSIR-CEERI Pilani to manage their Incubation Centre where the following Startups are being incubated:

Raytrig Innovations Pvt Ltd

Alphaerotics Pvt Ltd

Shocksafe International Techies Pvt Ltd

Parappadi Technologies Pvt Ltd

YouWe(UV) Purifiers

Pavone Technologies

Emuron Technologies Pvt Ltd

Aryabhatta Sciences Private Limited

IPR Training workshops conducted for  
MIDHANI

NRDC signed a MoA with MIDHANI on 17th September, 2018. As per the MoA, NRDC and Mishra Dhatu Nigam Limited (MIDHANI) agreed to organize workshop for capacity building in the field of Intellectual Property Rights, Technology Transfer and other relevant fields pertaining to NRDC and MIDHANI.

In the year 2018-19, NRDC conducted four workshops on "Intellectual Property Rights" at MIDHANI on consultancy mode.

Engagement of NRDC as a Consultant for BEML Patent Applications

NRDC qualified the tender in 2018-19 for drafting, filing and processing of BEML Patent Applications. During the financial year 2018-19, the Corporation filed more than 50 patent applications of BEML through our empanelled attorneys.



- **Technology Forecast**

Report on new technology applications in oil exploration for ONGC Energy Centre- The study was conducted in association with ARC and the final report was submitted to ONGC Energy Centre and the same was accepted and appreciated.

- **INDIA- ASEAN InnoTech Summit**

The Corporation being a Research Innovation Partner under the ASEAN-INDIA Innovation Platform of DST conducted a panel discussion on “A practical experience and challenges for commercializing technologies from research laboratories” at “INDIA-ASEAN InnoTech Summit” – a two-day Technology and Innovation Summit which was held on 29th-30th November 2018. The multi-agency and multi-outcome project is supported by Department of Science and Technology, Government of India.

The summit had more than 500 delegates from India and ASEAN region consisting of S&T Advisors, technology companies, start-ups, enterprises, industries, institutions, technology and innovation experts.

## 1.5. Promotional Activities

NRDC has been undertaking two promotional programmes of DSIR i.e. (i) Programme for Inspiring Inventors and Innovators (PIII) and (ii) Programme for Development of Technologies for Commercialization (PDTC). The Corporation has received Rs. 931.14 lakhs grants-in-Aid for implementing the above two promotional programmes for DSIR.

### 1.5.1 Programme for Inspiring Inventors and Innovators (PIII)

The programme is planned to encourage the innovators/inventors in developing new innovative technologies and products and tap these technologies for Corporation’s business activities. To achieve this Corporation carries out various activities like awarding meritorious inventions, protection of IP’s, evaluation of technologies, knowledge management and providing techno-commercial support to the new innovations/technologies etc. The activities carried out under this programme are summarized below:

#### NRDC Awards for Meritorious Inventions

The Corporation gives tax free awards every year to Indian Nationals for meritorious inventions in three Categories of, i.e., National Innovation Award, National Societal Innovation Award and National Budding Innovators Award under Programme for Inspiring Inventors and Innovators (PIII) a DSIR Grants-in-Aid Programme to encourage inventive talent in the Country.

NRDC awards recognise the efforts and creative talent of inventors and motivate them to aim higher and become more competitive and innovative in their field.

A total of nine awards have been announced for NRDC National Meritorious Invention Awards of the Year 2018 by the Prize Award Committee, Chaired by Prof. Deepak Pental, Professor of Genetics & Director CGMCP, Delhi University, New Delhi.

The Cash Awards amounting to ₹ 23 Lakh were transferred in the Bank Accounts of the 35 Awardees. The Shields and Certificates were conferred on the Awardees of the year 2018 by Dr. V.K. Saraswat, Member NITI Aayog, in the field of inland waterways transportation, energy, environment, health and engineering science during the NRDC’s annual event “Innovate India 2019” organized on 30<sup>th</sup>-31<sup>st</sup>





March, 2019 at EDII, Ahmadabad, with the theme, "Connecting Inventors, Innovators, Incubators and Investors for Accelerating the Growth of Start-ups". Complete report on Innovate India is separately placed in the Annual Report.

The brief details of Award winners for the Year 2018 are as follows:

### **NATIONAL INNOVATION AWARD OF THE YEAR 2018**

**National Innovation Award 1:** Design and Development of Self-Adjusting Fixed Type Jetty (SAFTJ)

Dr. Rajesh Kumar & Dr. K.K. Pandey of Indian Institute of Technology (BHU), Varanasi and Dr. Ankit Patel & Dr. Achin Agrawal of M/s. Acquafont Infrastructure Private Limited, Khanderao, Jalaun, have been jointly awarded ₹ 5 Lakh (Rupees Five Lakh only) for the development of, "Design and Development of Self-Adjusting Fixed Type Jetty (SAFTJ)".

**National Innovation Award 2:** Cathode Material and Lithium Ion Battery developed by Dr. S. Gopukumar, Dr. R. Thirunakaran & Dr. A. Sivashanmugam of CSIR-Central Electrochemical Research Institute, Karaikudi; Dr. C. Nithya of National Institute of Technology, Tiruchirapalli and Dr. S.K. Dhawan, Dr. R.B. Mathur, Dr. Priyanka Heda Maheshwari & Dr. Bhanu Pratap Singh of CSIR-National Physical Laboratory, New Delhi, have been jointly awarded Rs. 5 Lakh (Rupees Five Lakh only) for the development of, "Cathode Material and Lithium Ion Battery Therefrom".

### **NATIONAL SOCIETAL INNOVATION AWARD OF THE YEAR 2018**

**National Societal Innovation Award 1:** Underwater Remotely Operated Vehicle

for Polar and Shallow Water Research

Dr. M. A. Atmanand, Dr. G. Ananda Ramadass, Dr. S. Ramesh, Dr. N. Vedachalam, Shri. Annamalai Subramanian, Dr. D. Sathia Narayanan, Shri R. Ramesh, Shri. Harikrishnan. G., Shri S. B. Pranesh and Shri V. Doss Prakash of National Institute of Ocean Technology, Pallikaranai, Chennai, have been jointly awarded ₹ 3 Lakh (Rupees Three Lakh only) for the development of, "Underwater Remotely Operated Vehicle for Polar and Shallow Water Research".

**National Societal Innovation Award 2:** Complete Technology Package of Beehive Charcoal Briquettes for North East Hilly Region

Dr. Sandip Mandal, Dr. Arvind Kumar and Dr. Rajesh Kumar Singh of ICAR Research Complex for NEH Region, Umiam, Meghalaya, have been jointly awarded ₹ 3 Lakh (Rupees Three Lakh only) for the development of, "Complete Technology Package of Beehive Charcoal Briquettes for North East Hilly Region".

**National Societal Innovation Award 3:** Low Cost Arsenic Removal Filter for Drinking Water

Dr. Sirshendu De of Indian Institute of Technology Kharagpur, has been awarded ₹ 3 Lakh (Rupees Three Lakh only) for the development of, "Low Cost Arsenic Removal Filter for Drinking Water".

### **NATIONAL BUDDING INNOVATORS AWARD OF THE YEAR 2018**

**National Budding Innovators Award 1:** Internet of Things and Data Analytics based Price Fragmentation, Pay-As-You-Use and Supply Chain Automation and Optimization in LPG Distribution System

Shri Rahul Kumar, Shri Rahul Mahanot, Shri Katam Rishwanth and Shri Khethavath



Deepak of Indian Institute of Technology Bhubaneswar, have been jointly awarded ₹ 1 Lakh (Rupees One Lakh only) for the development of, "Internet of Things and Data Analytics based Price Fragmentation, Pay-As-You-Use and Supply Chain Automation and Optimization in LPG Distribution System".

**National Budding Innovators Award 2:** Highly Sensitive Reduced Graphene Oxide-Nickel Composite based Cryogenic Temperature Sensor

Shri Vaishakh Kedambaimoole of Indian Institute of Science, Bangalore, has been awarded ₹ 1 Lakh (Rupees One Lakh only) for the development of, "Highly Sensitive Reduced Graphene Oxide-Nickel Composite based Cryogenic Temperature Sensor".

**National Budding Innovators Award 3:** Smart FOB

Shri Manoj Dixit, Shri Saikumar Dani and Shri Ranajit Chavan of KLE Technological University, Vidyanagar, Hubballi, have been jointly awarded ₹ 1 Lakh (Rupees One Lakh only) for the development of, "Smart FOB".

**National Budding Innovators Award 4:** A Novel Way of Reducing Gaseous Pollutants by Solid Industry Waste supported by Electrical Discharges: Removal of Waste from Waste

Ms. Apeksha Madhukar, Research Scholar of Electrical Engineering Department, of Indian Institute of Science, Bangalore, has been awarded ₹ 1 Lakh (Rupees One Lakh only) for the development of, "A Novel Way of Reducing Gaseous Pollutants by Solid Industry Waste supported by Electrical Discharges: Removal of Waste from Waste".

### IPR Activities of the Corporation

The main objective of National IPR Policy is to encourage creativity and innovation

which helps in generation of Intellectual Properties and also protect the same by securing Intellectual Property Rights. Instruments of IP Rights are considered to achieve economic, social and technological advancement for a country. India has to emerge as a Global Intellectual Hub. The Indian Scientific Community/R&D professionals are very brilliant and have an enormous intellectual strength and this valuable intellectual strength is being harnessed by the Corporation for generating and securing Intellectual Property Rights in India for the growth and prosperity of our country.

The Corporation continued to provide financial, technical and legal support to protect inventions developed by various universities, R&D institutes, etc by filing patent applications in India and abroad in the year 2018-19.

The various services provided and activities undertaken under this scheme are:

**(I) IP Protection :** During the year 2018-19, the Corporation in its pursuit of protection of inventions and technologies developed by scientists, researchers, etc has provided financial/technical assistance for filing of 50 patent applications received from various universities, R&D institutes, etc. The Corporation has been prosecuting a number of patent applications filed in India and abroad. The efforts of the Corporation have resulted in the grant of 26 Patents (List enclosed as **annexure-15**) in diverse fields like chemical, Mechanical, sericulture, dairy, food, drugs, etc.

### **(II) Patent Search Facility**

The Corporation has been catering to the requests received from various Universities, R&D Institutes and



individual inventors etc for conducting the state of the art searches, the results of which are utilized for submitting research projects at university level so that the invention related to the R&D project should be novel and not a mere repetition of the R&D work already done. During the year 2018-19, 122 Prior Art Searches have been conducted by the Corporation.

The Corporation has also reached out to about 15 R&D institutions and universities for educating students, faculty members, R&D professionals, scientists, etc about the different promotional and commercial activities of the Corporation and also on the importance of protection of IP assets in the knowledge era by delivering lectures at various R&D institutes/Institutes/Colleges on the important topics such as Patenting System in India, Prior Art Search and its importance, etc.

### **Filing of Patent, Trademark and Design application under SIPP Scheme**

Indian Patent Office, Government of India recognized NRDC as a facilitator for filing patents, design and trademarks of start-ups under the Start-up Intellectual Property Protection (SIPP) scheme (CG/Misc./Facilitator/2016/506 dated 27.05.2016).

In the year 2018-19, 5 patent, 1 design and 4 trademark applications were filed under the SIPP scheme.

### **NRDC - Innovation Facilitation Centres (NRDC-IFCs)**

The Corporation is promoting innovation related activities in the Universities, Autonomous Institutions & Academic Institutions across the country through NRDC-Innovation Facilitation Centres

(NRDC-IFCs).

The Corporation with the support of Department of Scientific & Industrial Research, Ministry of Science & Technology, Government of India under PIII DSIR Grants-in-Aid Programme has set-up nine NRDC - Innovation Facilitation Centres in the premises of the Universities/ Institutions in different regions of the country, All India Institute of Medical Sciences, New Delhi; Amity University Uttar Pradesh, Noida; NIT Silchar, Indian Institute of Engineering Science & Technology, Shibpur (IESTS), Gujarat Technological University, Ahmadabad, Indian Institute of Technology Kanpur, National Institute of Pharmaceutical Education and Research (NIPER), Mohali; University of Hyderabad, Hyderabad & Indian Institute of Technology (BHU), Varanasi and signed MOUs with them. These Centres are implementing the programme effectively.

These centres are creating awareness on Innovation and IPR, including Capacity Building and Training. The Centres are also encouraging start-up projects and Entrepreneurship Development. The NRDC - Innovation Facilitation Centres are regularly organizing Seminars, Workshops and short term trainings on Innovation, Intellectual Property Rights and Technology Transfer in these Institutions and guided more than 1500 researchers, faculty and students for the effective management of Intellectual Property and technology transfer related issues to achieve the objectives of the NRDC-IFC Programme and encouraged the researchers, faculty and students to file about 50 Patent applications.

### **Promotion of Innovation in North-East & Rural Area**

The Corporation with an objective to create employment opportunities and capacity



building of development agencies for skill up-gradation through the application of innovative technologies in North East and Rural Areas carried out the following activities during 2018-19

- 1 EDP on “Capacity building and skill efficiency training of Tribal Bamboo Craft and regeneration of bamboo” organised at Bolung Village, District Lower Dibang Valley, Arunachal Pradesh and about 30 candidates were benefited during this programme.
- 2 EDP on “Skill training on total waste management for rural entrepreneurship development” organised in association with RELF, Jamshedpur at Jamshedpur, Jharkhand and about 22 participants were benefited during this programme.
- 3 EDP on “Sanitary Napkin for Women” organised at Nellore Rural in association with Vasantha Lakshmi Charitable Trust and Research Centre, Nellore and 34 beneficiaries were benefited during this programme.
- 4 EDP on “Skill building of bamboo artisans for bamboo utility products” organised at Gandhigram, West Tripura in association with Centre for Indian Bamboo Resource and Technology (CIBART), New Delhi and about 20 women artisans were benefited during this programme.
- 5 EDP on Technological up-gradation of traditional brassware artisans in rural area of Moradabad region” organised at Moradabad, Uttar Pradesh in association with Gyan Mandir Vidyalaya, Lucknow, Uttar Pradesh and 55 artisans both men and women were benefited during this programme.

- 6 EDP on “Training, capacity building operations and maintenance of AINA Health Care Diagnostics System.” organised at, Temi Tea Garden, Gangtok, Sikkim in association with SHRISTI, New Delhi. During this programme about 40 candidates were benefited

#### **MoMSME-NRDC Intellectual Property Facilitation Centre (IPFC), and WIPO-Technology Innovation Support Centre (TISC) Vishakhapatnam**

NRDC-Intellectual Property Facilitation Centre (IPFC) & WIPO-Technology Innovation Support Centre (TISC) Visakhapatnam has developed wide network with scientific and industrial communities. It is working effectively towards its roles and objectives in activities including technologies licensing, IP facilitation and capacity building and awareness programs and participated in many exhibitions and technology promotional activities of collaborated with multilateral organizations like World Intellectual Property Organisation (WIPO) and United Nations Educational, Scientific and Cultural Organization (UNESCO) and conducted various Intellectual Property and technologies entrepreneurship development programs.

For the current year, NRDC-IPFC&TISC was able to sign assignment deeds for twelve number of technologies and has commercialized seven number technologies generating a total revenue of Rs. 85,34,400/- (Rupees Eighty-Five Lakhs Thirty-Four Thousand and Four Hundred) including applicable GST.

NRDC-IPFC&TISC VSKP has received 43 applications for patent facilitation services out of which 19 applications were presented before IPR committee, got recommended and were filed. It has received 15 trademark



application and recommended/filed 12 applications. It has filed 2 copyright applications and 4 industrial design applications. Among industrial design, 2 applications were facilitated to Hindustan Shipyard Limited, a defence PSUs of Govt of India, Visakhapatnam.

NRDC IPFC & TISC also provided IP consultancy services to various Ordnance Factory under Ministry of Defence, Govt of India consisting of the Indian Ordnance Factories of Jabalpur, Kanpur and Korwa, facilitated the IP both patent and trademark of "DHANUSH 155/45 Calibre Towed Gun system", India's first indigenously designed and developed gun system by Indian Ordnance Factory for Indian army.

NRDC-IPFC&TISC has organized and proactively participated in more than 30 EDPs/IPR Awareness programs/Seminars/Workshops out of which NRDC collaborated with various institutes and successfully conducted eight IPR workshops and awareness programs with WIPO-TISC, CIPAM, IOCL, APIS and others. It has also organized advanced training and workshop organized on "Patent Search (Basic & Advanced Level)" on 5th & 6th July, 2018 at Visakhapatnam in association with World Intellectual Property Organisation (WIPO) and Cell for Intellectual Property Management (CIPAM), Department of Promotion of Internal Trade and Industry (DPIIT), Govt of India . The workshop was aimed at presenting the in-depth knowledge on various IP Search National and International databases and enable navigation steps of searching for patent and non-patent literature for finding out whether inventions/patents propose to file are qualified for filing patent or not. Knowing the state of the art/ searching tools and hands on experience shall increase chance of developing an issuable patent and saves from costly patent

litigations and unnecessary infringement. IP Information has considered as one of the key factors in measuring innovations credibility of universities / academia under NIRF framework by NAAC, UGC Govt. of India. More than 150 participants have taken part from various MSMEs, start-ups, industries, universities, research institutes, academia.

NRDCIPFC&TISC has assigned for enquiring and visiting various companies at Hyderabad, which are part of the programme aimed at technological Self-Reliance (PATSER) of DSIR's scheme-Technology Promotion, Development and Utilization (TPDU) for an ascertainment/pursue of current Status/Addresses/Financial Positions, Collection of Information/data and verification regarding companies involved In court/arbitration cases and there by the royalty/award to the corporation through arbitration and mediation at Delhi.

### 1.5.2 Programme For Development Of Technologies For Commercialisation (PDTC)

The programme aims to add value to the lab-scale technologies developed by the universities/research institutes/organizations, dissemination of the information and promotion of entrepreneurship development and appropriate innovative technologies in rural and north-east regions. Under this scheme the Corporation carried out various activities like Development of Innovation Portal, Value addition through preparation of Basic Engineering Design Package (BEDP), Market Surveys, and dissemination of information through exhibitions/seminars/workshops etc., promotion of indigenous technologies abroad through showcasing of indigenous technologies. The various programmes undertaken in this scheme are:



### 1.5.2.1 Technology Value Addition

Technology upgradation provided to 45 technologies by conducting MS, BEDP, FR, so as to take the technology from lab to industry.

#### Basic Engineering Design Package (BEDP)

The preparation of Basic Engineering Design Package carried out by the Corporation is a very important value addition activity for laboratory scale technologies. The package provides information on the plant and equipment, raw material and the product, etc. which helps the entrepreneurs in decision making as well as implementation of the project. It requires a detailed study for working out the final process scheme, which can be obtained through series of simulation of the laboratory scale process and then incorporating required engineering input so that the process is workable. Once the BEDP is prepared based on the data the feasibility study and Detailed Project Report (DPR) can be prepared. With these reports it becomes easy for the entrepreneur to carry out detailed engineering for setting up the commercial plant. The reports also help the Corporation in planning for marketing of its technologies.

During the year, BEDP on the following technologies were conducted through professional empanelled consultants:

Sr. No	Name Of Technology
1.	Live-attenuated Salmonella Typhimurium vaccine
2.	Low cost jute based biodegradable Sanitary Napkin
3.	Microbial Fermentation Process for production of DHA micro algal oil

4.	A novel method of storing and delivering PGPR/ microbes through biocapsule
5.	Zinc solubilizing PGPR for soil drenching
6.	Seed coating composition and process of its preparation, PGPR microbial consortium for growth promotion in black pepper, PGPR talc formulation for ginger, PGPR talc formulation for seed spices
7.	Millet based bread (loaf type)
8.	Nutrabeverage from Mahua flower blending with Guava, Pomegranate, Mango, Etc
9.	Development of value added food products using Mahua flower, Amla and Tamarind i) Candy from Mahua and Tamarind ii) Chutney from Mahua and Tamarind iii) Squash from Tamarind, Mahua and Amla
10.	Development of Anti-corrosive and degreasing solution from Sal leaves

#### Feasibility Reports

This activity has been started from financial year 2018-19. The preparation of Feasibility Report carried out by the Corporation is a very important value addition activity for laboratory scale technologies. The package provides information on the investment to be made on plant and equipment, raw material and the product, etc. which helps the entrepreneurs in decision making as well as implementation of the project according to their investment capacity. It also helps the entrepreneurs to get loans from financial institutions by submitting the Feasibility Reports. Based on the data of Basic Engineering Design Package (BEDP) the Feasibility Report is prepared. With these

reports it becomes easy for the entrepreneurs to carry out detailed engineering for setting up the commercial plant and planning for investment strategy. The reports also help the Corporation in planning for marketing of its technologies.

During the year (2018-19), Feasibility Reports on the following technologies were conducted through professional empanelled consultants:

S. No	Name Of Technology
1.	Low cost jute based biodegradable Sanitary Napkin
2.	Microbial Fermentation Process for production of DHA micro algal oil
3.	Nano Ocular Gel
4.	10 HP Tractor

### Market Surveys

Market surveys are of considerable significance to the process of technology transfer. It makes the technology package more attractive to entrepreneurs. During the year 31 market survey reports on various technologies were conducted through professional empanelled consultants. Some of them are:

- Low cost jute based biodegradable Sanitary Napkin
- Glass Textile Reinforced Concrete Crash Barrier System (SERC)
- Urethanized Bitumen System For Water Proofing of Roofs (CBRI)
- Microbial Fermentation Process for production of DHA micro algal oil
- Microbial Industrial Process for Metal Gluconates
- Development of value added food products using Mahua flower, Amla and Tamarind

- Development of Anti-corrosive and degreasing from Sal leaves

### Socio Economic Impact Assessment (SEIA) of Technologies Licensed by NRDC

NRDC since its inception has commercialised technologies to more than 5000 entrepreneurs. It was felt that the socio economic impact of the technologies/products licensed by NRDC on common man/ masses should be carried out for major technologies. Therefore, the activity has been started from current financial year 2018-19. The report is prepared based on the information of Licensee, production data and interaction with the end users of the product, their feedback, etc. The reports will help the Corporation in planning for marketing of its technologies in specific sector as per the feedback and demand of the end-users.

Socio Economic Impact Assessment (SEIA) reports on the following technologies were conducted through professional empanelled consultants.

S. No	Name Of Technology
1.	Super absorbent Hydrogel
2.	Potassium Humate
3.	Indelible Ink
4.	Foliar Micronutrient Formulation for Black Pepper
5.	Sea Weed Extract Fertilizer
6.	Mosquito Larvicidal Formulation Based On Bacillus Thuringiensis Var Israelensis
7.	Vijetha- Silkworm Bed Disinfectant
8.	Ankush- Silkworm Bed Disinfectant
9.	Fruit Fly Trap
10.	20 HP Tractor

### Exhibitions and Publicity

Participation in 30 exhibitions, seminars,



workshops and entrepreneurship development programs are of vital importance for the creation of awareness about the activities of the Corporation and the role of the Corporation in technology transfer and technologies available with the Corporation for transfer. With this objective in view, the Corporation participated in 29 exhibitions in India organized by various agencies. Corporation also organized 5 industry interaction meets to reach-out to the industry at Gangtok (Agriculture & Herbal), Kolkata (Agri and Food Processing), Vijaywada (Agriculture & IOT), Ahmedabad (Pharma Bio and Health) and Tripura.

### Publications

NRDC continued to bring out its regular publications — Awishkar (Monthly Hindi S&T magazine) and Invention Intelligence (Bi-Monthly English S&T magazine). The main objectives of the magazines are to disseminate information and create awareness about new technologies, inventions, innovations, IPR issues, etc. amongst the masses and foster the spirit of inventiveness, innovativeness and entrepreneurship in the country.

During the year some of the important topics covered in Awishkar are:

Stephen Hawking; Festival of Innovations and Entrepreneurship at Rashtrapati Bhavan; Floating Solar Panel; Plastic Pollution; Climate Change and Agriculture, CSIR Mission: Provisioning Safe Drinking Water for All; Designer Human; Agri-Innovations for Food Security; Big Data; Parker Solar Mission; Commemorative issue on Gunakar Muley; Nobel Prizes in Science- 2018; Climate Change and Biodiversity; Gas Hydrate; AIDS; Internet of Things; Microplastic Pollution; Report on Indian Science Congress-2019; and Global Warming. An interview of Professor CNR Rao was also published in the July 2018 issue of Awishkar.

During the year some of the important topics covered in Invention Intelligence are:

Internet of Things; Plastic Pollution; Gas Hydrate; Blockchain Technology; Geological Time Scale and the Meghalayan Age; Fourth Industrial Revolution; Business Intelligence – Digitalization and Data Mining; Nobel Prizes in Science-2018; Indian Science and Technology – Vision 2030; Report on Indian Science Congress-2019; The Saga of Indian Science and Congress; Major Millstones of S&T in 2018; Energy; Shale Gas; and Bio CNG from Biomass. An interview of Professor CNR Rao was also published in the July-August 2018 issue of Invention Intelligence.

### List of other Publications during 2018-19

- NRDC Brochure (NRDC Serving the Nation Since 1953)
- एनआरडीसी (वर्ष 1953 से देश सेवा में रत)
- NRDC National Meritorious Invention Awards-2018
- NRDC Annual Report (2017-18)

### 1.6. Human Resource

The real asset of any company is its human resource. The total regular manpower of the Corporation as on 31st March, 2019 was 59 viz. (Group A-28, Group B-10, Group C-18 and Group D-3) and 18 contractual engagements (viz 12 technical + 6 Non-technical). The representation of reserved category of regular employees as on 31.3.2019 stood at SCs (33.9 % - (20 employees) ST (1.7 % - 1 employee) OBC (3.4 % - 2 employees), PwD (3.4% - 2 employees), ESM NIL (No employees) and women representation (16.9 % - 10 employees) and Minority Community (6.8% - 4 employees) respectively. The Corporation is following all the instructions and Govt. directives relating to reservation of the above categories issued from time to





time. In some areas, their representation could not be brought to the prescribed levels due to non-filling of vacant posts and the continuing rationalization of existing manpower. The employee-management relationship was cordial throughout the year.

### Human Resource Development

Training and development of all levels of employees was given due priority by the Corporation to increase effectiveness. Special emphasis was also given to organisation building and shaping right attitudes, team building and work culture besides preparing employees to understand the trends in fast changing technology/switching over to latest technology for achieving higher results in productivity and profitability. Training & development activities have played a key role to upgrade the workforce to adopt new technologies, system and make the workforce ready to take the future challenges. To achieve this objectives, during the year 08 officials 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. For streamlining the attendance and linking the same with the finance (pay roll software) online Management Resource Management System was made operationalised in MoU 2018. The system consists of individual employee login through which various activities/services which were initially carried-out on paper have been made online in the Corporation. The thrust for better utilisation of Human Resources and improvement in work practice continued during the year.

#### 1.7. Right To Information (RTI)

Under the provisions of Section 4 of the Right to Information Act, 2005, every Public Authority is required to display necessary

information to citizen of India to secure access to information under the control of public authority in order to promote transparency and accountability in its working and functioning.

NRDC, being a responsible Public Sector Undertaking, has displayed the requisite information on its website under the head RTI. The management has notified APIO, PIO, Transparency Officer and the First Appellate Authority (FAA) in compliance with the requirements of the RTI Act. Between April 01, 2018 and March 31, 2019, a total of 26 applications were received by the Company and all of them were disposed off by providing requisite information as per rules. Apart from RTI applications, the Company did not receive any appeals against the information provided to the applicant. It is pertinent to note that Central Information Commission has not passed any adverse order against the PIO/FAA. In addition to this we are pleased to inform that NRDC was awarded Grade 'A' in the Transparency Audit Conducted by the Central Information Commission for disclosure under Section 4 of the RTI Act by various public Authorities.

#### 1.8. Technology Absorption, Adaptation And Innovation

Being a Section 8 company under Companies Act 2013, while a major objective of the Corporation is the promotion, development and commercialization of indigenous technologies, the Corporation itself does not carry out any R&D. However, it promotes and provides limited finances assistance for R&D on a meritorious & need basis to both laboratories and industries.

As the Company's operations do not involve any manufacturing or processing activities, the particulars required under Rule 8(3) (A)&(B) of the Companies (Accounts) Rules,



2014 regarding conservation of energy and technology and absorption are not applicable.

### 1.9 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 increasing the use of Hindi Rajbhasha in office during the year 2018-19. 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 popularize the use of Hindi, the Corporation organized a "Rajbhasha Pakhwara" (14-30 September 2018). During the Pakhwara Hindi Essay writing competition was organized & cash awards were given to the winners. Cash Awards were also given to employees under "Rajbhasha Incentive Scheme". Four Work Shops on Use of Hindi in day to day work were organized for making the Hindi work more comfortable. 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.