

**GOVERNMENT OF INDIA
SCIENCE AND TECHNOLOGY
LOK SABHA**

UNSTARRED QUESTION NO:4714
ANSWERED ON:22.04.2015
RESEARCH PROJECTS OF CSIR
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Will the Minister of SCIENCE AND TECHNOLOGY be pleased to state:

(a) whether Council of Scientific and Industrial Research (CSIR) has taken up any research projects for new invention in various fields for the benefit of the common people during the last three years; and

(b) if so, the details thereof particularly in Rajasthan during the last three years?

Answer

MINISTER OF STATE OF SCIENCE AND TECHNOLOGY AND MINISTER OF STATE OF EARTH SCIENCES (SHRI Y.S. CHOWDARY)

(a) The Council of Scientific and Industrial Research (CSIR) has been providing the S&T knowledgebase needed for the benefit of the common people. The efforts are focused at bringing in desired S&T interventions for improving the quality of life, removing drudgery and augmenting income of the people.

CSIR has developed technologies for food and food processing; water; healthcare; building and construction; environment and sanitation; rural roads; cultivation and processing economic plants; farm machinery; leather; pottery etc. The technologies developed have been gainfully utilized in several states and contributed for improving quality of life and economic growth of common people.

CSIR has developed a number of technologies on water, ranging from source finding to mapping of water resources, from quality assessment to enhancing potability of water and from recycling to waste water treatment. The technology for community scale RO desalination plants has been developed. The RO plants in various states (Rajasthan, Tamil Nadu, Delhi, West Bengal, Gujarat etc.) have been set up based on the technology. Further, technology for arsenic removal from water has been developed and based on the same common people have benefited in the state of West Bengal. Also high flux hollow fibre membrane based technology for water disinfection and purification at affordable cost has been developed and is being used at commercial level.

CSIR has developed KrishiShakti, a small range (11.2 hp) diesel engine tractor for farmers with small land holdings for effective tilling. The technology of the same has been transferred and manufacturing has been initiated in West Bengal. The tractor was launched in Delhi on 20th November 2014 and five tractors were handed over to farmers.

CSIR has improved the performance of gur bhattis which are used in large number by the villagers in sugarcane crop areas. The improved gur bhattis have longer furnace life, consume less fuel (bagasse) and emit less exhaust smoke. CSIR has developed improved design kerosene multi wick stove (non-pressure type), which is popularly known as Nutan Large stove. By use of the improved design stoves, about 25-30% fuel saving is achieved. CSIR has also developed a kerosene pressure stove (offset burner type) with 10-15% fuel saving. These stoves are used in households, small restaurants, roadside tea shops etc. They are popular among rural masses and are also used in urban and semi-urban areas.

A cost effective and efficient anti tarnishing lacquer has been developed for brasswares, helping the Moradabad brass cluster. The developed lacquer is very efficient to prevent tarnishing for long durations. Also, energy efficient brass melting furnace has been developed which is smoke-free coal furnace, handles more charge (brass melt), reduces gas emission and pollution by 80% and consumes 20% less coal. It is user friendly as artisans can adopt this furnace without changing their current practices and like the present furnace, this modified version can also be repaired by the artisans. The knowhow has been transferred for commercial use.

CSIR has developed an indigenous substitute of Ukraine clay in granito ceramic tiles which has reduced the Ukraine clay requirement from 20% to about 1%, reducing thus the foreign material import and associated costs. This has made major economic difference and benefitted small and medium scale enterprises in Gujarat.

A food processing unit has been set up at CSIR-Centre for High Altitude Biology (CSIR-CeHAB) in the remote tribal region of Lahaul and Spiti. A brining unit has been designed and prototype developed for the preservation of locally and abundantly produced peas and cauliflowers. The knowhow was showcased at the District level Tribal Fair at Keylong and training organized for the benefit of progressive farmers in the area of food and food processing: making novel products from Buckwheat; and also brining of the peas which is a major crop.

CSIR has worked with the Indian Council of Agricultural Research (ICAR) for the development of highly priced rice variety, Samba Mahsuri, resistant to the serious Bacterial Blight (BB) disease. This new variety called, improved Samba Mahsuri has been released

for commercial cultivation and is being very much appreciated by farmers growing rice.

A novel variety of Ashwagandha with high root yield of 15 quintal/hectare has been developed and released to farmers which would help farmers with more earnings. The Ashwagandha has useful applications in pharma applications as anti-inflammatory, anti-stroke and anti-arthritis drug adjuvant.

The people of North East India make a number of leather products but they were unable to reach the market and earn desired profit due to lack of aesthetic appeal and standardisation. There was a need to transform this knowledge into wealth by increasing the value of the products without losing its real essence. CSIR carried out a comprehensive survey in the north eastern region. Based on the inputs from the survey, new ranges of products were developed. The handbags are crafted and designed with the ethnic materials of the northeast and the inspirations are derived from Ornaments, Dresses & Artifacts adorned by tribal folks of the northeast India. The products were displayed in various national/ international fairs and have attracted many enquiries. This has benefited the women entrepreneurs of North Eastern region.

CSIR has set up post-harvest centres in Mizoram (Aizawl) and Arunachal Pradesh (Pashighat). These centres are focused at helping the local farmers in the region for value addition to their agricultural produce. The centres house technology for high efficiency drying and processing of ginger, cardamom, turmeric, chillies etc. The farmers are able to sell their produce at 200-25% higher price to the processing centres set up. The CSIR Post Harvest Technology Centres would generate direct employment to about 300 people.

CSIR has introduced and commercialized floriculture in Lahaul and Spiti region of Himachal Pradesh. The laboratory has played a catalytic role in the promotion of the commercial floriculture in Himachal Pradesh. Utilizing CSIR agro-technologies of Lilium, carnation, and gladiolus flowers in the region, the flower growers have realized good income through sale of loose and cut flowers at Delhi flower market. Over 3000 farmers are engaged in floriculture in Himachal Pradesh.

Knowhow for economically valuable cultivation for the seaweed *Kappaphysalavarezi* have been developed. This seaweed is being commercially cultivated by >800 SHGs in Tamil Nadu. Each member involved in seaweed cultivation is earning on an average ` 5000/- per month for a period of 8 months in a year. The seaweed also yields bioenergy products along with co-generation of bio-fertilizer.

CSIR has been adopting villages to promote employment generation and income augmentation. It has thus catalyzed commercial cultivation of Geranium in Uttaranchal and Lavender in Jammu & Kashmir through community participation. In these end to end missions, farmers have been trained not only for cultivation of Geranium and Lavender but also for extraction of oil, augmenting thus their income. Likewise CSIR efforts through development of niche Mentha varieties and their propagation for mass cultivation are noteworthy. The efforts have led to economic growth and have enabled India to acquire a world leadership position in Menthol mint oil production and export.

CSIR efforts for socio-economic development had led to: empowering people of the Kashmir Valley through creation of aromatic industry; development of bio-inoculants for enhancing plant productivity and its dissemination to the farmers in Uttar Pradesh in the partnership with the State Government on a very large scale and it has enhanced agriculture productivity; and development of mushroom technology, its transfer and training which has benefitted economically the rural women in North East States.

CSIR has been contributing in the area of healthcare. Some recently developed technologies/interventions benefitting the common people include: Streptokinase (a drug for cardiovascular disease); Risorine (a cost effective bioavailability enhanced anti-tuberculosis drug); Battery operated hand-held MicroPCR (towards affordable and point of care disease diagnostics for Tuberculosis, Malaria, Dengue, Chikungunya, Hepatitis B and H1N1); nonClonableID technology for medical product authentication; Diagnostic system for affordable, point of need testing to manage HIV and TB; Novel molecular diagnostics for eye diseases; and eHealth Center (eHC, a platform for the fourth paradigm of science, data-intensive discovery, while bringing affordable healthcare services to the doorstep of people).

CSIR has played a major role in protecting the traditional knowledge by creating a Traditional Knowledge Digital Library (TKDL). The TKDL contains information in 5 international languages, i.e. English, Japanese, Spanish, French and German concerning 2.93 lakh medicinal formulations in Ayurveda, Unani and Siddha. Through the TKDL access agreement concluded with European Patent Office (EPO, 34 Member States), US Patent & Trade Mark Office (USPTO), Canadian Intellectual Property Office (CIPO), IP Australia, Japan Patent Office (JPO), United Kingdom Patent and Trademark Office (UKPTO) and German Patent Office (GPO) examiners of these offices can utilize TKDL for search and examination of Intellectual Property applications filed but cannot make any third party disclosure. TKDL is recognized globally as a model for protection of traditional knowledge.

(b) In the state of Rajasthan the focus of R&D is on: Electronics System (Agri- Electronics, Embedded Systems, Digital Systems, Power Electronics), Electron Tubes (Gyrotron, Klystron, Magnetrons, Travelling Wave Tubes), and Semiconductor (Hybrid Microcircuits, IC Design, MEMS and Microsensors, Sensors, Photonics and Optoelectronics); quality leather; quality salt production etc. The knowledgebase developed by the constituent CSIR laboratories across the country are also utilizable by Rajasthan state as well. In addition, the CSIR-Central Electronics Engineering Research Institute (CSIR-CEERI) in Rajasthan is pursuing R&D towards achieving scientific and technological excellence in the area of electronics engineering and has taken into account the region-specific requirements as well. The projects carried out in recent past and some on-going projects of the 12th Five Year Plan are as follows:

S.No. Project Title Brief Information
Projects carried out in recent past

1. Improved Rural Tanning

Technology developed for following: (i) improved rural bag tanning technology,
(ii) Conversion of wet blue to finest leather;
(iii) improved method for sole leather,

Technologies transferred to rural artisan
in Rajasthan

2. Innovative Materials for Kolhapuri Developed innovative material for Kolhapuri
footwear footwear in place of bag tanned leather
and engineered Kolhapuri bottom preparation
for enhanced productivity. Utilized discarded
leather scraps from shoe industry for
fabrication. The technology has resulted
in additional income generation for the
Rajasthan leather artisans

3. Quality Salt for Marginal Salt CSIR-CSMCRI technology helps in production
Producers of high purity solar salt, Impurity level
is reduced which meet the requirements of
BIS specifications, Fetch premium price
of 200-250% to the salt workers, 80 salt
producers in Rajasthan benefitted,
Technology transferred to marginal and
small scale producers

Ongoing 12th Five Year Plan Projects

1. CSIR-Central Electronics Engineering (i) Very High Power Microwave Tubes:
Research Institute (CSIR-CEERI), Design and Development Capabilities;
Pilani (ii) Research Initiative on Nano Devices
and Nano-Sensors;
(iii) Advanced Microsensors and
Microsystems: Design, Development and
Applications; and

(iv) Advanced Facility for Nano Electronics