

GOVERNMENT OF INDIA
MINISTRY OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH
LOK SABHA
UNSTARRED QUESTION No. 4310
(TO BE ANSWERED ON 21.03.2018)
SOCIO-ECONOMIC DEVELOPMENT KNOWLEDGE BY CSIR

4310. SHRI GOPAL SHETTY:

Will the Minister of SCIENCE AND TECHNOLOGY be pleased to state:

- (a) whether the Council of Scientific and Industrial Research (CSIR) plays the most important role in providing required knowledge of socio-economic development of the country including rural areas and small cities;**
- (b) if so, the details of the achievements and accomplishments made during the last two years;**
- (c) whether the CSIR has taken several measures to develop scientific temper among the youth which has given positive results; and**
- (d) if so, the details thereof?**

ANSWER

MINISTER OF SCIENCE AND TECHNOLOGY AND EARTH SCIENCES
(DR. HARSH VARDHAN)

- (a) Yes, Madam.**
- (b) The Council of Scientific and Industrial Research (CSIR) has been playing important role in providing the necessary S&T knowledgebase needed for the social and economic development of the country including that of rural areas and small cities. CSIR has always endeavored to deploy its relevant knowledge base/ technologies on the ground for benefit of common man. CSIR operated project activities under 'CSIR-800' program aiming at bringing in desired S&T interventions for improving quality of life of rural/common people at base of the economic pyramid. CSIR has steadily contributed its technologies/ advisory services encompassing end-to-end solutions in various domains like: food and food processing; building and construction; pottery; enhancing potability of water; energy efficiency; cultivation and processing of economic plants; affordable health etc.**

The achievements and accomplishments of the key 'CSIR-800' initiatives carried out during last two years is enclosed at Annexure-I.

Further, highlights of the activities carried out in recent past are as follows:

A food processing unit set up at CSIR-Centre for High Altitude Biology (CSIR-CeHAB) in the remote tribal region of Lahaul and Spiti is benefitting local common farmers, enabling making of novel products from buckwheat; and for brining of peas (a major crop). CSIR developed an automated processing unit for sugar cane juice bottling, which is being popularized. CSIR is empowering the selected Women self-help groups in Manipur through augmentation of infrastructure and value addition of locally grown crops.

CSIR has taken steps to document traditional architecture of rural areas of the Western Himalayan region and is providing need based S&T interventions. CSIR is conducting training programs across country for dissemination, training, demonstration & improvement of appropriate rural housing technologies to various stakeholders and the common man. CSIR imparted training and skill development techniques to terracotta pottery rural artisans across various states and tribal tasar farmers of Telangana state for enhancing their income.

CSIR developed and disseminated a number of technologies on water. CSIR deployed arsenic removal technology in villages of West Bengal. CSIR also deployed de-floridation plants and variety of other water purification plants for community/ domestic use in Rural Areas for common people. CSIR is making efforts to provide sustainable/ safe drinking water in drought prone and fluoride affected villages of Nalgonda and Ananatpur districts of Telangana and Andhra Pradesh. Specific plants based Phytorid technology exclusively designed for the treatment of municipal, urban, agricultural and industrial wastewater has been deployed in several parts of country. CSIR's improved iron removal plants having low cost design and improved aeration have been successfully installed in Bankura (West Bengal) benefitting about 1000 rural people. Additional, 55 plants have been commissioned at different places to cater to needs of about 25000 rural people.

CSIR has developed and installed 1-5 kW power Solar Power trees in rural sectors and towns. It takes less land of only 4 sq ft for a 5 kW solar power tree as compared to 400 sq ft of land required in case of the conventional solar photovoltaic layout.

CSIR has developed improved biomass chullhas like “NEERDHUR” for household and community level and improved pine needle stove with significant lower emissions for biomass. CSIR has also developed forced draught bio-mass fired cook-stoves with higher efficiency of about 35%. This cook-stove can also operate a forced draught fan or charge a battery. For many of the stoves developed by CSIR, entrepreneurs are eligible for the getting subsidy from Government. CSIR has improved gur bhattis for large number of sugarcane growing villagers. The improved gur bhattis have longer furnace life, consume less fuel (bagasse) and emit less exhaust smoke. CSIR also developed Baggasse drying unit for Gur making plants using waste heat recovery technique.

CSIR’s post-harvest centres in Mizoram (Aizawl) and Arunachal Pradesh (Pashighat) are helping local farmers for value addition to their agricultural produce. The centres house technology for high efficiency drying and processing of ginger, cardamom, turmeric, chillies etc. Accordingly, farmers are able to sell their produce at 20-25% higher price. CSIR has been continuously popularizing mushroom technology through transfer and training to benefit rural women in North East States.

CSIR transferred its Medicinal & Aromatic plants (MAPs) and other related technologies for rural development in the Western Himalayan region and adjoining plains. CSIR labs endeavoured to strengthen MAPs industry in Kashmir Valley through field level demonstration and propagation of region specific superior genotypes of MAPs in Jammu & Kashmir region. Efforts are being made to train farmers on cultivation and value addition of medicinal and aromatic plants like Lavender, Rose, Lemongrass, Tegetes, Mint, and Phalsa. Awareness camps for farmers of the area besides demonstrations of Mobile Distillation Unit for extraction of essential oils have been organized. Already hundreds of farmers in more than a dozen villages of Kathua district (J&K) have been distributed slips of lemongrass, Java citronella and vetiver for cultivation at more than 100 hectares area under a project.

CSIR has been making efforts for popularization of rice variety Improved Samba Mahsuri, a bacterial blight resistant rice cultivar, jointly developed by CSIR and Indian Council of Agricultural Research (ICAR). It has been grown in about 90,000 hectares of farmers’ fields in the five states of Andhra Pradesh, Telangana, Tamil Nadu, Karnataka and Maharashtra.

CSIR disseminated knowhow for economically valuable cultivation for the seaweed *Kappaphys alvarezii* in coastal areas. 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 disseminated bioinoculants for enhancing plant productivity, in UP to the farmers in partnership with State Government on a very large scale. There has been 29% increase in growth levels and ~20% increase in tuber yield of potato as compared to the untreated ones. CSIR bioinoculants have been tried in Cabbage, Cauliflower, Lady's finger, French bean, Garden pea, Turmeric, Ginger and Maize in demonstrations in various districts, between 265 to 1714 m altitude. The bio-inoculants have resulted in 15-50 % yield increase, control of various diseases and reduced cost of production besides environmental benefits.

CSIR developed Samadhan Kendra, a Rural Information Technology centre for rural community. It provides details about the agriculture, portioning pest disease information system (PDIS) on the major crops of that particular area, types of control measures to be adapted etc. It also provides market related information to farmers to enable them to sell their produce at higher premium without aid of any middle men. CSIR established several Samadhan Kendras in Telangana and Andhra Pradesh. Each Samadhan Kendra caters to population of about one lakh rural people.

CSIR and Meghalaya government are working in collaboration for popularization of dehydrated floral crafts of CSIR for income enhancement. More than 100 women in 36 clusters have been empowered across the State with knowledgebase of CSIR. The technology is branching out, as the trained women are willingly acting as Master Trainers, and extending this technology within their groups/ clusters across the State.

CSIR labs have made herbal formulations (anti-malarial, anti-arthritis, anti-fungal etc.) for benefit of common people. CSIR conducted Science and Health Awareness Programs focusing rural areas and small towns. CSIR deployed and popularized safe contraceptives among rural women. CSIR scientists also conducted awareness programs among rural women about Post-menopausal osteoporosis related health issues

and their management. CSIR designed and deployed oxygen enrichment units (OEU) for Indian rural/ tribal community.

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 common people).

(c) Yes, Madam.

(d) For inculcating scientific temper among young school children, CSIR in partnership with Kendriya Vidyalaya Sangathan (KVS) has started “Jigyasa” program connecting CSIR labs with KV schools across the country. The CSIR/KVS MoU on “Jigyasa”, signed on 6th July 2017, marked the beginning of the program. In last 9 months, about 12000 students got exposed to the CSIR labs and its various scientific activities/research facilities.

Further, CSIR regularly undertakes activities aimed at disseminating information on its scientific competence and achievements through exhibitions, seminars, workshops and otherwise using mass media and interactive channels of communication including print, electronic and digital media. CSIR also reaches out to common man and youth extensively through social media including Facebook and tweeter. To inculcate scientific entrepreneurial spirit among college students recently one program “BEST- Be an entrepreneur of Science & Technology” was held at Visakhapatnam on 25th January 2018. The event was enthusiastically attended by more than 500 young students.

The science popularization activities also include lecture series of eminent scientist and industry captains for benefit of diverse CSIR stakeholders including youth. CSIR labs invite children from

schools/colleges on various occasions such as National Science/Technology Day, CSIR lab Foundation day.

CSIR through its laboratory namely CSIR-National Institute of Science Communication and Information Resources (CSIR-NISCAIR) publishes and disseminates scientific and technological information that benefits various segments of the common man including youth. Three popular science magazines are published by CSIR-NISCAIR namely Science Reporter (English monthly) Vigyan Pragati (Hindi, monthly) and Science ki Duniya (Urdu, quarterly), which are well circulated among youth.

Achievements and accomplishments of the key 'CSIR-800' initiatives carried out during last two years

S.No.	Lab	CSIR initiatives/ offerings	Achievements and accomplishments
1.	CSIR-CBRI	Advisory services for S&T interventions in the Traditional Architecture of Rural areas	S&T solutions for design and construction of hill houses maintaining traditional architecture duly strengthened using the innovative technologies, and also to reduce the use of the costly building materials.
2.	CSIR-CCMB	Improved Samba Mahsuri, a bacterial blight resistant rice cultivar	Enhanced incomes of rice farmers of several states. Beneficiaries are farmers who cultivate fine grained rice varieties in affected areas. This variety has been particularly helpful to farmers of Kurnool, east and West Godavari districts of Andhra Pradesh where there have been several recent epidemics of bacterial blight. For 2015-16 and 2016-17, the additional income added (Trait value) during this period is ~ ₹ 101 crores. The area under ISM cultivation during the said period is 25,000 and 30,000 hectares respectively. The total estimated value of produce is approximately ₹ 528 crores.
3.	CSIR-CCMB	Popularization of Apple cultivation in Eastern ghats and Gondwana regions Telagana, Andhra Pradesh and Odisha	<ul style="list-style-type: none"> • Alternate income generation in non-traditional apple growing parts of the country saving transport costs. • To enhance apple production in the country, both in season as well as off season and reduce the import • Apple is a long-duration horticultural tree crop; and would require another 2-3 years, for fruition.
4.	CSIR-CECRI	Cyanide free electrolytes for electroplating of brass, silver and gold	<p>(i) Protection of livelihoods through environmental friendly electroplating, 100 palters trained.</p> <p>(ii) Replacement of cyanide copper electrolytes with economically viable, environment friendly cyanide free electrolytes for finishing of brass, silver and gold .</p>
5.	CSIR-CFTRI	Automated processing unit for sugar cane juice bottling	<ul style="list-style-type: none"> • Income enhancement by more than 50% as compared to traditional processing • Shelf-life of the product is 4 months • Color & taste similar to that of fresh juice
6.	CSIR-CFTRI	Fermented and dehydrated ready mixes for Idli/ Dosa Batter, Malted Weaning Food, Fortification of Atta, Garlic Paste, Ginger Paste, Mango Ripening: Accelerated Process, Ready to Serve Fruit Juices & Beverages etc.	Nutrition and Income Enhancement

7.	CSIR-CGCRI	Demonstration of High capacity ceramic membrane modules (8m ³ /hr) for Arsenic and Iron removal at Ramchandrapur village, Dist Malda, West Bengal	One Plant installation complete, handed over to PHED, Govt. of West Bengal. Yearly Benefit is ₹ 16.06 Lakhs for one unit catering to 500 people.
		Training and Skill Development Programme for the Rural Artisans Associated in Making terracotta pottery across various states	Training imparted to 127 artisans from various states across the country through five residential programs of 10 days duration each.
8.	CSIR-CIMAP	Improved agro and processing technologies of economically important medicinal and aromatic crops like Lemongrass, Palmarosa, Vetiver, Citronella, Menthol Mint, Ashwagandha, Lemongrass	Demonstration of lemongrass, vetiver, palmarosa, menthol mint and ashwagandha were made on farmer's field covering an area of 1140 acres in different part of country including Bundelkhand, Vidharabha and Kutch region. From these demonstrations crop produce worth ₹ 482.50 lakhs (essential and ashwagandha roots) was obtained. A total employment of 1,53,500 mandays was created from the cultivation of these plants.
9.	CSIR-CMERI	Semi-automated Ginger processing technology for producing ginger flakes	Income generation ₹ 2580/ton per day, ₹ 7.74 lakhs/ton annum.
10.	CSIR-CMERI	Improved Iron Removal Plants	Enables iron removal at half of the cost. The expenditure of commercial available domestic filters for 500 people is approx. ₹ 1 lakh and the cost of Improved Iron Removal Plant for 500 people is ₹ 50,000.
11.	CSIR-CSMCRI	Improvement of quality of solar salt through scientific intervention	Beneficiaries additional profit ₹ 100/MT of salt
12.	CSIR-CSMCRI	Seaweed cultivation for marginal societies in coastal regions	The average income per beneficiary is estimated as ₹ 9,643/-
13.	CSIR-CSMCRI	Agronomic practices of <i>Salicornia</i> in green house	295 farmers trained. Each farmer getting benefit of 5000/- from <i>Salicornia</i> cultivation. Total income generated: ₹ 14.75 lakhs
14.	CSIR-IHBT	Aromatic and Herbals: Production of characterized planting material of industrial and commercial plants for facilitating crop diversification	An area of 285 acres brought under high demand industrial crops viz., stevia, wild marigold, damask rose and other herbals like cardamom, lavender, geranium etc. with a total revenue generation of ₹ 370 lakhs.
15.	CSIR-IHBT	Introduction of important cut flower crops for crop diversification	Income enhancement. Floriculture expanded in additional 45 acres of land, benefitting 265 growers with net return of ₹ 259.71 lakhs in HP and adjoining states UK, J&K, Punjab
16.	CSIR-IICT	Samadhan Kendra	For extending benefits out of modern agriculture farming, pest control methods, soil testing, seed management etc. Each Kendra caters needs of 20 villages in and around covering approximately 1 lakh population. 50,000 vegetable farmers in Medak and 70,000 mango farmers in Chittoor district benefitted in last few years.

17.	CSIR-IICT	Sustainable Tassar culture development by tribal tasar farmers in Telangana and Andhra Pradesh	Income generation of ₹ 4,000 per farmer, 400 tasar farmers benefitted. During 2016-17 ₹ 24.67 lakhs have been realized by the farmers of Karimnagar and Adilabad district of Talengana respectively by selling their cocoons.
18.	CSIR-IICT	Popularization of Pheromone Application Technology (PAT)	PAT farmers benefitted with an additional income of 20 % in comparison to non-PAT farmers, ease of application, up to 50 % reduction in pesticides, quality produce, health benefits and environmental safety etc. Returns ranged ₹ 2500-25000 per acre depending upon crop in 1735 acres.
19.	CSIR-IICT	Highly Compact Reverse Osmosis/ Nanofiltration systems for ground water and surface water purification (50-1000 L/h)	Successfully commissioned 15 compact plants of 50 - 250 L/h capacity in schools, hostels & villages and 12 pilot plants of 1000 L/h capacity. 5 lakhs population is getting benefitted and the Revenue generation is ₹ 75 lakhs per annum.
20.	CSIR-IICT	Biogas Plants Based on AGR for food waste treatment	Utilizes 1000 kg of waste per day each at 3 plants Benefits ₹ 2879 – 3348/- per day (₹ 10.50 -12.22 lakhs per annum)
21.	CSIR-IIIM	Field demonstration of region specific Medicinal & Aromatic plants genotypes of CSIR for socio-economic upliftment of masses in J&K region (J&K AROMA AROGYA GRAM-JAAG)	<ul style="list-style-type: none"> • CSIR improved agro-technologies on MAPs deployed in targeted districts of Jammu region • 1745 growers/farmers trained • Income generation of about ₹ 10 lakhs • Quality planting material of about ₹ 20 crores
22.		Cultivation of <i>Monarda citriodora</i>	<ul style="list-style-type: none"> • Agro-technology of Jammu monarda transferred at 10 acres of land in Jammu, Srinagar and Hardoi. • Standardization done for thymol rich crystal development protocols from essential oil of Jammu Monarda (99% pure)
23.		Production technology for value added "Kashmir Aroma Kit"	<ul style="list-style-type: none"> • Total 2654 valued added Aroma Kits prepared from six types of essential oils produced in CSIR-IIIM farms • Ten value added products such as mosquito repellent liquid, mosquito repellent cream developed in collaboration with a private company
24.	CSIR-IIP	Improved <i>Gur</i> making plant	Energy efficiency in Gur making process through CSIR-IIP improved technology has converted it from a part time business to a profitable full-time business for sugarcane farmers. Nearly 23% increased income in one season can be achieved with this improved technology that has been proved through the installation of 37 plants. The total savings figure for 37 units is ₹ 66 lakhs per annum. Moreover, for every 1 tonne of Gur produced from improved plant 271.5 kg. of CO ₂

			have been reduced.
25.	CSIR-NBRI	Bioinoculants for enhancing the performance of crops on sodic wastelands using the most potential salt and temperature tolerant strains of <i>Trichoderma</i> spp., <i>Bacillus</i> spp. and <i>Pseudomonas</i> spp.	17 Biofertilizer and 9 Biopesticide producing labs of UP were provided high value, stress tolerant microbes (PSB, Rhizobium and Azotobacter) and hands on training. These labs produced 45 lakh packets, used all over the state. 100 farmers trained. An area of 2,62,800 ha covered leading to saving of 29,343 MT of fertilizer.
26.	CSIR-NCL	CSIR-NCL's UF-membrane based water purification units for Indian rural /tribal community	Water supply to rural and tribal community of several villages.
27.	CSIR-NEERI	Clean water and sanitation in rural areas	<ul style="list-style-type: none"> • NEERDHUR" technology has been successfully developed and demonstrated in 4 villages across 2 states namely Mohagaon, Gothangoan in Nagpur district, Savroli-Palghar, Mumbai and Chunakhali. • Rejuvenation of degraded lands using bamboo biomass through microbe assisted green technology (MAGT) • Demonstration of rapid composting technology in selected villages of Vidharbha, Maharashtra • Design and development of in-vessel solar composter for rural areas
28.	CSIR-NEERI	Demonstration of mass scale production of spirulina protein in rural areas	<ul style="list-style-type: none"> • Health Benefits
29.	CSIR-NEERI	Demonstration of decentralized phytosystems for treatment of domestic wastewater and its use in agriculture	<ul style="list-style-type: none"> • Greywater treatment
30.	CSIR-NEIST	Liquid deodorant cleaner production	₹ 6 lakh/ Entrepreneur /annum
31.	CSIR-NEIST	Training on Weaving using Jacquard Looms and Product Development	₹ 60,000 / annum
32.	CSIR-NGRI	Identification and exploration of groundwater resources in problematic terrains and drought affected regions for meeting the drinking water needs of rural communities	<ul style="list-style-type: none"> • Community based sustainable water recharge solutions
33.	CSIR-NIIST	Bio gas digester	<ul style="list-style-type: none"> • Income enhancement and environment protection
34.	CSIR-NML	Brassware lacquer and brass melting furnace	Income enhancement and Energy Efficiency
