GOVERNMENT OF INDIA
MINISTRY OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF SCIENCE AND TECHNOLOGY
RAJYA SABHA
UNSTARRED QUESTION No. 3158
ANSWERED ON 27/03/2025

GOVERNMENT'S INITIATIVE FOR INCLUSIVE GROWTH

3158# SHRI MITHLESH KUMAR:
      Ms. KAVITA PATIDAR:
      Will the Minister of SCIENCE AND TECHNOLOGY be pleased to state:

(a)   whether it is a fact that Government has taken initiatives to develop an inclusive society and to empower various sections of the society through the interventions of science and technology;

(b)   if so, the details thereof;

(c)   whether any steps have been taken by Government to evolve research and vocational programmes to provide higher level education and skilled employment opportunities to the marginalised and backward classes; and

(d)   if so, the details thereof ?

ANSWER
MINISTER OF STATE (INDEPENDENT CHARGE) FOR THE
MINISTRY OF SCIENCE AND TECHNOLOGY & EARTH SCIENCES
(DR. JITENDRA SINGH)

(a) to (b):   Ministry of Science and Technology, through Department of Science and Technology (DST), Department of Biotechnology (DBT) and Department of Scientific & Industrial Research (DSIR)/Council of Scientific & Industrial Research (CSIR), has taken several initiatives to develop an inclusive society and to empower various sections of the society through the interventions of science and technology. The initiatives promote inclusivity and equity by encouraging access to appropriate S&T solutions, emphasizing skill development, capacity building, community engagement, and collaboration with various stakeholders to improve the socio-economic empowerment of marginalized/ weaker sections, women, disadvantaged and various other sections of the society.

Department of Science and Technology (DST) has implemented various schemes & programmes to constantly endeavor societal development and empowerment by infusing S&T based interventions. These initiatives focus on delivering location specific, science-led solutions, emerging and appropriate technologies for sustainable livelihoods, establishing research & development (R&D) facilities with sophisticated instruments, skill development, training and capacity building to enable an inclusive society, primarily Youth, Women, Scheduled Caste (SC) and Scheduled Tribe (ST), Economically Weaker Section (EWS), Divyangjan, elderly, and other marginalized and backward communities.

Department of Biotechnology (DBT), through its Fellowship, Teaching and Societal Development programmes, emphasizes creating income & employment generation avenues, dissemination of field-tested and proven biotechnological innovation and technologies developed by government autonomous institutions, national laboratories, universities, scientific research institutes etc. for immediate benefit of the community such as women, SC, ST population, rural population and marginalized sections of the society, especially farmers and unemployed youth in aspirational districts and rural areas.

Department of Scientific and Industrial Research (DSIR), through Council of Scientific and Industrial Research (CSIR), is utilizing the knowledgebase and technologies available across CSIR institutes to empower different strata of society, particularly addressing rural challenges through various projects with deployment of relevant CSIR technologies/innovations/interventions for augmenting the income and improving the quality of lives in villages. This contributes to developing an inclusive society and empowering various societal groups through Science and Technology (S&T) interventions.

In addition, several other ministries, including the Ministry of Micro, Small and Medium Enterprises; Ministry of Social Justice and Empowerment; Ministry of Education; Ministry of Housing and Urban Affairs; Ministry of Labour & Employment; Ministry of Culture; Ministry of Food Processing Industries; and the Ministry of Agriculture & Farmers' Welfare, have also implemented programs to empower various sections of society.

(c) to (d):   The Government has taken several steps to evolve research and vocational programmes to provide higher level education and skilled employment opportunities to the marginalised and backward classes. These programs and training initiatives have empowered participants from diverse backgrounds by equipping them with the essential skills in their respective fields. As a result, they have contributed to building a skilled workforce and promoting inclusive development across the country. Details of the major research and vocational programs being implemented under DST, DBT and DSIR/CSIR, and various other Ministries and Departments are as follows:-

1. **Department of Science and Technology (DST)**
   a. **Scheduled Castes Sub Plan (SCSP)** and **Tribal Sub Plan (TSP)** supported around 500 S&T projects during the last two decades in different states in diverse areas of agriculture, resource management, microenterprise development, art & craft, post-harvest technologies, health and nutrition, engineering and allied aspects, training and skill development, drinking water and sanitation, and energy to improve the quality of life of SC/ST communities. In addition, following activities are being performed to achieve the desired objectives:
      * Around **52 Science Technology and Innovation (STI) Hubs** have been established for SC & ST Communities to nurture and ensure the development, improvement and delivery of appropriate and relevant STI approaches for their equitable inclusive growth through creation of sustainable livelihoods and improving the quality of life in tune to their growing aspirations;
      * The programme on "**Accelerated Development of Particularly Vulnerable Tribal Groups (PVTGs)**" complements the National PVTG Mission announced by Union Government in March 2023 by developing sustainable STI solutions to addresses the vulnerabilities faced by the 75 PVT Groups;
      * Around 11 SC/ST Cells are being supported in different States for mapping (gathering) information on livelihood system (weakest linkages and strengths), local & indigenous knowledge and ingesting it with technological information to help in development of specific strategies, technology dissemination and last mile delivery of interventions to target beneficiaries for defining implementation policies;

   b. **Science & Technology for Women (STW) programme** through its Women Technology Parks (WTP) aim to improve the weakest link of the predominant livelihood system of women in an area and promote social entrepreneurship and women employment based on the strongest link of the livelihood system through interventions of Science, Technology and Innovations. Around 40 WTPs have been established and

150 projects have been supported to develop technologies for the addressing the issues related to women.

c. **Strengthening, Upscaling & Nurturing Innovations for Livelihood (SUNIL) programme** supports collaborative projects from NGOs and Knowledge Institutions (KIs) for improving the S&T knowledge, skill enhancement, capacity building and socio-economic conditions of the community through network programmes. Around 8 projects have been supported for S&T based solutions through applied research for socio-economic development of Economically Weaker Section (EWS) and capacity building of Community based Organizations (CBOs) & NGOs. Around 8 such projects have been supported during the year 2024.

d. **Inspire Awards-MANAK** (Million Minds Augmenting National Aspiration and Knowledge) has awarded around 21,087 ST students during last 5 years for promoting 'Original ideas' having potential to address societal needs through Science & Technology especially in context of National flagship Programs such as Swachh Bharat, Digital India, Swasth Bharat, Make in India, Energy, Environment, Sanitation etc. An award of Rs. 10,000/- is being provided to each beneficiary.

e. **R&D Infrastructure** hands-on training programmes cum sensitization on the state-of-the-art equipment, use and application of various instruments and analytical techniques and benefitted around 10000 tribal researchers & students through **Synergistic Training program Utilizing the Scientific and Technological Infrastructure (STUTI) programme, Fund for Improvement of S&T Infrastructure (FIST) and Sophisticated Analytical & Technical Help Institutes (SATHI)** centres. To date, nearly 8573 researchers from various educational background and subject areas have been trained and in addition 11,441 school students attended the 132 awareness programs related to many state- of- the- art instruments and technologies and established 15 Sophisticated Analytical Instrument Facilities (SAIF) in different parts of the country.

f. **National Mission on Interdisciplinary Cyber Physical System (NM-ICPS)** established about 30 labs/experience centres to provide students with opportunities for continuous learning and hands-on practice. **Divyasampark IHUB Roorkee** trained 17,409 students under the TSP Program for Devices Materials and Technology Foundation. Approx. 46,974 number of beneficiaries trained under skill development programme of Inter Cyber Physical Systems. The **Drone Didi Workshop**, organized under the "Digital Agri Village" project at IIT Bhilai, showcased the innovative use of drones in precision agriculture.

g. **Anusandhan National Research Foundation (ANRF)** through Inclusivity Research Grant (IRG), erstwhile EMEQ Scheme provided funding support to around 125 researchers every year belonging to the Scheduled Caste/Scheduled Tribe to undertake research in frontier areas of science and engineering.

h. **National Quantum Mission (NQM)** encourages SC, ST, marginalized and backward classes from all states and districts, to participate and benefit from the Mission's programs through established four Thematic Hubs (T-Hubs) (Quantum Computing at IISc. Bengaluru; Quantum Communication at IIT Madras in association with C-DOT, New Delhi; Quantum Sensing & Metrology at IIT Bombay; and Quantum Materials & Devices at IIT Delhi).

i. **National Innovation Foundation (NIF)** under its dissemination and social diffusion efforts, introduced livelihood generating innovations to remotest locations in the country like Jammu and Kashmir, North Eastern States, Andaman and Nicobar Islands amongst others. NIF has till date recognised 1145 Grassroots innovators; implemented its technologies in few Correctional Homes and provided risk capital to 238 innovation-based enterprise projects between 2003-18 with support from Small Industries Development Bank of India (SIDBI) under Micro Venture Innovation Fund (MVIF). Around 71 community workshops have been established in 24 states of the country to provide access of scientific/ technological tools to the people in rural areas.

j. **National Initiative for Developing and Harnessing Innovations (NIDHI) - Inclusive Technology Business Incubators (iTBIs)** centers provide financial support, mentorship, and access to resources that empowers startups, entrepreneurs and individuals from marginalized backgrounds especially SC/ST to transform their innovative ideas into viable businesses and established 48 NIDHI iTBI centers and startups in Tier 2 & Tier 3 cities to provide innovative solutions addressing local problems having significant societal impact on the nearby regions, including marginalized communities. Additionally, under Innovation and Entrepreneurship (I&E) based training programmes, around 23498 beneficiaries have been trained through 317 organizations in different parts of the country during last 5 years.

k. **North East Centre for Technology Application and Reach (NECTAR)** provides special outreach programs to ensure that students from rural and tribal communities have access to quality STEM education and facilitated the establishment of a Music School for Persons with Disabilities (PwDs) in Shillong and trained individuals to seek employment as music teachers, performers, or studio artists, fostering financial self-reliance. A foundation course of 6 months in Computers and Employability for Persons with Visual Impairment. In addition, establishment of **STEM Education Hub** at NECTAR, Meghalaya serves as a resource centre, offering training and workshops on interactive experiments, coding workshops, robotics training, and AI applications for students and teachers from various schools and colleges in Meghalaya.

l. **Science and Heritage Research Initiative (SHRI) Cell** initiated **Millet program** to promote traditional food, preservation of recipes, scientific intervention for increased productivity, storage life, and post-processing of millets, generally grown and consumed in tribal, marginalized, and backward areas. The Millet Program supports these communities through scientific interventions such as preserving their traditional knowledge, clinically validating the health benefits, providing better cost-effective methods and technologies for production and storage of millets.

2. **Department of Biotechnology (DBT)**
   a. DBT supports National level programs like DBT-Junior Research Fellowship program and the PG Teaching program to promote higher education in the country in order to facilitate students from various backgrounds, including SC and other weaker sections.
   b. Under Biotechnology Industry Research Assistance Council (BIRAC), the **Social Innovation Programme for Products Affordable & Relevant to Societal Health (SPARSH)** supports biotechnological interventions to address critical societal need of marginalized communities through SPARSH centers.
   c. Through **STAR College Programme,** the support was extended to colleges in remote and underprivileged areas under Urban and Rural categories since 2018-19. During this

period, 75 colleges from rural areas, 13 colleges from Aspirational Districts and 58 girl's colleges in rural and marginalized areas benefitted from this initiative.

    d. **Biotech-Krishi Innovation Science Application Network (Biotech-KISAN)** is aimed at enhancing coordination between farmers and research laboratories for exploring solutions to limitations in agricultural practices through deployment of advanced technologies. The programme also emphasizes on development of bio-based agri-enterprises in rural areas based on affordable technologies.

3. **Department of Scientific and Industrial Research/Council of Scientific and Industrial Research (CSIR)**

    a. **CSIR Aroma Mission is** catalysing Rural Empowerment through Cultivation, Processing, Value Addition and Marketing of Aromatic Plants and initiated "CSIR-Aroma Mission" in 2017. Since then, more than 43,600-hectare land has been brought under cultivation of aromatic crops generating employment of about 80 lakhs rural man-days,115 startups supporting new entrepreneurships.

- CSIR enabled the famed **Purple Revolution** by introducing Lavender cultivation in 10 districts of J&K benefitting more than 1000 farming families through increasing their income from Rs. 20,000/- to Rs. 200,000/- per acre per year.
- **Atmanirbharata in Lemongrass essential oil** with the implementation of CSIR Aroma Mission, India has become one of the largest exporters of lemongrass essential oil in the world with about 600 tonnes worth Rs.60 crores of lemongrass essential oil exported during 2021-22.
- **Golden revolution in Himachal Pradesh** has become the highest producer of aromatic marigold essential oil in the country leading to the production of 8 tonnes of marigold oil (worth Rs. 11.2 crore), which has enhanced the farmers' income 2.5 times over traditional crops (Rs. 50,000-60,000/ha/year).

    b. **CSIR-Floriculture Mission** initiated in 2020-21 utilizes the knowledgebase available in CSIR institutes to help Indian Floriculture farmers in income enhancement and entrepreneurship development. Its implementation has helped to bring about 6603 acres of land under cultivation in 244 districts covering 29 States and UTs benefiting about 18,692 floriculture farmers.

- A significant achievement is the indigenous development of Tulip bulb production in Lahaul & Spiti that helped in reducing the import of planting materials.
- For the domestication of indigenous wild ornamental plants, propagation techniques including Tissue Culture have been developed for 20 species that are collected from Western Himalaya, Eastern Himalaya, Western Ghats, Eastern Ghats and Indo-Gangetic plains.
- In collaboration with the Khadi and Village Industries Commission (KVIC), Apiculture has been integrated with CSIR Floriculture Mission for high quality Honey production. So far total 8,277 Bee Boxes provided to the clusters developed by CSIR Labs benefiting around 8000 farmers.

    c. **CSIR Seaweed Mission** aimed to "Generate the knowledge and innovations that would help make seaweed cultivation a new form of agriculture which is remunerative, eco-friendly, sustainable and expansive in scope".

- CSIR takes pride for being the first in the country to pioneer the Kappaphycus alvarezii cultivation technology leading to commercial farming of the seaweeds in India.
- More than 800 self-help groups (SHGs) in Tamil Nadu have adopted Kappaphycus cultivation as means of their livelihood.

- The Seaweed research has resulted in the development of a new seaweed industry generating additional employment opportunities and revenue. Seaweed technologies have been developed and transferred to 12 companies for commercialization.
- About 5000 fishermen were trained so-far under various schemes, especially in Tamil Nadu, Gujarat, Andhra Pradesh.

    d. **CSIR Integrated Skill Initiative** (Bridging the skill gaps in Scientific Disciplines) is providing skilling, reskilling, and upskilling training covering a wide spectrum of science and technology for undergraduates, postgraduates, and research students, including participants from marginalized and backward classes - SC/ST, differently-abled, minorities, and other vulnerable communities who seek employment opportunities. From June-2019, CSIR-UGC NET, the provision of reservation for appearing in CSIR-UGC National Eligibility Test (NET) to the candidates belonging to Economically Weaker Sections (EWSs) is given and provided relaxation in marks to the candidates belonging to OBC/SC/ST/PwD/Third gender category who have secured at least 50% marks (without rounding off) in Master's degree or equivalent examination are eligible whereas the candidates belonging to General/Unreserved category, eligibility criteria is 55% marks. A relaxation of upto 5 years is provided to the candidates belonging to OBC-NCL/SC/ST/PwD/Third gender categories and to women applicants.

4. **Ministry of Agriculture & Farmer's Welfare (MoAFW)**
   Indian Council of Agricultural Research (ICAR) under MoAFW played an important role in setting the academic standards in agricultural education ecosystem and recently restructured the course curriculum of 13 agriculture and allied disciplines with focus on skill and entrepreneurship development for better employability as per National Education Policy-2020 (NEP-2020). **Skill development is pursued through READY (Rural Entrepreneurship Awareness Development Yojna) programme** which is designed to provide the desired Hands-on-Training (Skill Development), Rural Awareness Work Experience (RAWE), Plant Training/ Industrial attachment/ Internship and projects to undergraduate students including marginalized and backward classes for their entrepreneurship development. About 900 Experiential Learning units in the Agricultural Universities (Aus) are providing training related to skill development to all students from marginalized and backward classes and also to develop their entrepreneurial skills for better employment. Total 60,802 number of students have attended training through RAWE during last three years.

5. **Ministry of Micro, Small and Medium Enterprises (MoMSME)**
   MoMSME through Entrepreneurship and Skill Development Programs (ESDP) division motivates youth representing different sections of the society including SC/ST/Women, differently abled, Ex-servicemen and BPL persons to consider self-employment or entrepreneurship as one of the career options. The ultimate objective is to promote new enterprises, build capacity of existing MSMEs and inculcate entrepreneurial culture across the length and breadth of the country.

6. **Ministry of Social Justice and Empowerment (MoSJE)**
   MoSJE launched Ambedkar Social Innovation and Incubation Mission (ASIIM) to foster innovation among SC students, researchers, and those working in Technology Business Incubators (TBIs) and Atal Incubation Centers (AICs) for turning into commercial ventures in sectors like agri-tech, ed-tech, IT, environment, waste management, and green energy etc. Department of Social Justice and Empowerment (DoSJE) has been implementing Central

Sector umbrella scheme of **"Scholarships for Higher Education for Young Achievers (SHREYAS) for Scheduled Castes (SCs)"** for Educational and Entrepreneurial Empowerment and Intra-perineurial Leadership of Talented students from Scheduled Caste communities in 4 sub-Schemes such as **Top Class Scholarship for SC students (TCS) scheme which** supports meritorious SC students for pursuing higher studies beyond 12th class; **Free Coaching for SCs, OBCs and beneficiaries of PM-cares children Scheme** to enable them to appear in competitive examinations for obtaining appropriate jobs in Public/Private Sector and/or for securing admission in reputed technical and professional higher education Institution; **National Overseas Scholarship (NOS) Scheme** provides financial assistance to facilitate the low income meritorious students belonging to the Scheduled Castes, De-notified Nomadic and Semi-Nomadic Tribes, Landless Agricultural Labourers and Traditional Artisans category to obtain higher education; **National Fellowship for SC students (NFSC) scheme** provides support to Scheduled Caste students for pursuing higher education; **Scheme for Implementation of the Rights of Persons with Disabilities Act, 2016 (SIPDA)** supports study and research on priority areas of disability sector and R&D of suitable products, aids & appliances for empowerment of persons with disability (PwDs). Further, PM-DAKSH Portal supplements the implementation of National Action Plan for Skill Development of PwDs (NAP-SDP) in skilling and employment of PwDs.

7. **Ministry of Education (MoE)**
   MoE supported **Entrepreneurship Development Cell and Incubation Centre** to promote the entrepreneurship skills among the marginalised and the backward classes in order to provide them with high levels of education and skilled employment possibilities. NITs/IIEST Shibpur initiated industry-driven programs aiming to train students in work skills (from all sections of students including OBC) and make them employment-ready. As a result, in the last few years, some of the top IT companies in India have started their own academia-industry interface programs.

8. **Ministry of Housing and Urban Affairs (MoHUA)**
   MoHUA has implemented the **"Deendayal Antyodaya Yojana - National Urban Livelihoods Mission (DAY-NULM)"** from February 2016 to 30th September, 2024 to provide Employment through Skill Training and Placement (EST&P) component to the urban poor as per the skill demand from the market, so that they can set up self-employment ventures or secure salaried employment. Skill training will be linked to accreditation and certification and preferably be undertaken on a Public-Private-Partnership (PPP) mode. It involves reputed institutes, including ITIs, Polytechnics, NITs, industry associations, engineering colleges, management institutes, skill training centers, foundations, National Skill Development Corporation (NSDC) and other reputed entities in government, private and civil society sectors.

9. **Ministry of Labour & Employment (MoLE)**
   Directorate General of Employment is implementing the scheme **"Welfare of SC/ST jobseekers"** through the network of 25 National Career Service Centres (NCSC) for SC/STs across the country. The objective of the scheme is to enhance the employability of SC/ST jobseekers through Vocational Guidance, Career Counselling, Computer Training, Pre-recruitment Training etc. Market driven Computer Course trainings are imparted to jobseekers through National Institute of Electronics and Information Technology (NIELIT) with a view to prepare them to meet the demands of the labour market. A Special Coaching programme is also run through local training institutions to prepare SC/ST jobseekers for the Group-C competitive examinations.

10. **Ministry of Culture (MoC)**

MoC through **National Council of Science Museums (NCSM)** popularize science and technology in cities, urban and rural areas to empower different strata of society (science teachers/students/young entrepreneurs/technicians/physically challenged/housewives) through its chain of 26 science museums and science centres across the country. In addition to organization of exhibitions, seminars, popular lectures, science camps, training programmes teachers, young entrepreneurs, physically challenged and also for benefit of students and common man in cities, urban and rural areas, NCSM conducts Mobile science exhibition, displaying interactive exhibits on various scientific themes to remote and aspirational districts for providing students with the latest development on Science & Technology. Science Centres under NCSM also organizes programmes/visits of underprivileged students regularly.

11. **Ministry of Food Processing Industries (MoFPI)**

MoFPI through **National Institute of Food Technology Entrepreneurship and Management (NIFTEMs)** has introduced several measures to promote inclusive education and skill development among marginalized and backward communities such as Skill Development Training Programs for rural youth, women, and farmers to enhance their skills in food processing, value addition, and food safety; Entrepreneurship Development Initiatives to assist small-scale entrepreneurs, including those from SC/ST and OBC categories, in setting up food processing units; Reservation in the Institution to ensure accessibility to quality education to marginalized and backward communities; Scholarships for Underprivileged Students to offer financial assistance to meritorious students from marginalized communities to pursue MTech, and Ph.D. programs.

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