KARNATAKA STATE COUNCIL FOR SCIENCE AND TECHNOLOGY

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Karnataka State Council for Science and Technology (KSCST) an autonomous S&T organization under Department of Science & Technology, Government of Karnataka.

Established in the year 1975 is one of the first State S&T Councils to be set up in the country. Education, Water, Energy, Housing, Geospatial Technologies, Natural Resource Management are some of the sectors identified by KSCST to pursue research, development and dissemination of ideas, products, services and technologies with the support of State and Central government. During the 50 years of its existence, KSCST has been pro-actively engaging itself to identify, propose and implement S&T based solutions to locale specific needs / problems. In association with the Indian Institute of Science and several other premier R&D institutions, KSCST has been executing many projects and programs aimed at improving socio-economic conditions of the people of the state.

Over the years, a number of technologies have been translated from research and demonstration phase to the implementation and operational phase. KSCST provides support to the State Government in formulation of S&T based policies. Also supports Central and State Governments in scientific surveys, project implementation, evaluation, co-ordination & monitoring, organization of scientific meets and awareness programs.

MAJOR PROGRAMMES

1. **Natural Resources Data Management System (NRDMS): Empowering Local Planning with Geospatial Technology**

   The Natural Resources Data Management System (NRDMS) serves as a comprehensive repository of natural resources and socio-economic geodatabases, providing critical support for local-level planning. Key achievements include:

- **Pioneering Village Cadaster:** Developed and implemented guidelines for generating high-resolution village cadastral maps using satellite imagery, representing a significant advancement in land management.
- **Geospatial Action Planning:** The first state to mandate the use of geospatial technologies in creating action plans for line departments, resulting in a Geospatial Action Plan that promotes informed decision-making.
- **Supporting Local Bodies:** Provides ongoing assistance to urban and rural local bodies in developmental planning, ensuring data-driven strategies for effective resource allocation.
- **District Administration Support:** Offers crucial geospatial support to district administrations for improved governance and efficient service delivery.
- **Custom Web Applications:** Developed a suite of web applications tailored to various GIS applications, enhancing accessibility and usability of geospatial data.

Village Information System (VIS)

The Village Information System (VIS) provides digital spatial data on various aspects of villages, including:

- Demography
- Natural resources
- Land use/land cover
- Socio-economic factors

This information supports decision-makers and planners in making informed decisions at the village and cadastral levels.

Key Accomplishments: Completed a Village Information System atlas for the Ragihalli Gram Panchayat of Anekal Taluk, Bengaluru Urban District.

NRDMS facilitates informed decision-making and promotes sustainable development by leveraging the power of geospatial technology at the local level.

2. Academic and Industry Interaction Cell (AIIC): Fostering Innovation

The Academic and Industry Interaction Cell (AIIC) is dedicated to fostering innovation and collaboration, with a strong focus on student projects and outreach initiatives. Key activities include:

- **Student Project Program (SPP):** Provides crucial support and mentorship to undergraduate and postgraduate engineering students for their innovative projects. To date, the KSCST has supported over 18,500 projects.
- **Commercialization Success:** Facilitated the commercialization of over 200 student projects, demonstrating a strong commitment to translating innovation into real-world impact.

- **Virtual Laboratories and E-Learning Centres:** Established e-learning centres in government high schools, providing access to advanced educational resources, digital content, and interactive lab experiments through 3D animations and the latest IT gadgets, supported by internet access.
- **Faculty Support:** Offers support for faculty projects, encouraging the development of innovative products and services.
- **Science Outreach:** Organizes science popularization and communication programs, Science for Rural Karnataka from Ph.D., Scholars of IISc., teacher enrichment initiatives, and special events such as a science radio serial, and celebrations of National Science Day, National Mathematics Day, and National Space Day.

KSCST through its Academic and Industry Interaction cell is committed to nurturing the next generation of innovators and promoting a culture of scientific inquiry and engagement.

3. Water Technology Initiatives by KSCST

KSCST is actively engaged in addressing water-related challenges, focusing on both water quality and quantity. Key initiatives include:

Water Quality Improvement:

- Demonstration of water defluoridation using technology developed by the Indian Institute of Science (IISc) in Kolar and Tumakuru districts.
- Demonstration of arsenic removal using nanotechnology developed by the Indian Institute of Technology Madras (IITM).
- Pharmaceutical industrial effluent treatment through Plasma process for improved recycling.

Water Conservation and Management:

- Promotion of awareness, training programs, and technical support for the implementation of Rainwater Harvesting (RWH) and groundwater recharge.
- Providing technical support to over **600** government and private organizations across the state for RWH and groundwater recharge projects.
- Conducting **96** RWH training programs for engineers, architects, and plumbing contractors.
- Establishing the Sir M. Visvesvaraya Rain Water Harvesting Theme Park in collaboration with the Bangalore Water Supply and Sewerage Board (BWSSB).
- Conducting over **200** awareness programs and approximately **300** demonstrations / exhibitions to promote RWH throughout the state.

4. **Preserving Karnataka's Legacy: Digital Heritage Initiatives: Karnataka Digital Heritage (KDH):**

   KSCST has successfully completed the Karnataka Digital Heritage (KDH) Programme, a pioneering initiative to digitally preserve the state's rich cultural legacy. The project employed cutting-edge 3D laser scanning and geospatial technologies to meticulously document approximately **530** state-protected heritage monuments. This comprehensive documentation process generated detailed 3D point cloud data, intricate 3D mesh models, and precise CAD engineering drawings. The resulting digital assets support:

   - **Virtual Tourism:** Offering immersive experiences for visitors worldwide.
   - **Restoration Efforts:** Providing invaluable data for the preservation and restoration of these historical treasures.
   - **Reconstruction Planning:** Aiding in the reconstruction of monuments, if needed.

   This project is conducted in collaboration with the Department of Archaeology, Museums and Heritage (DAMH), Government of Karnataka.

   Karnataka Digital Museum:

   Karnataka is home to over **50** museums, including **18** government museums managed by DAMH, housing a vast collection of approximately **18,000** invaluable antiquities. These artifacts represent the state's diverse history and include sculptures, inscriptions, manuscripts, weaponry, paintings, coins, and jewelry from prominent dynasties such as the Satavahana, Chalukya, Hoysala, and Vijayanagar empires.

   Recognizing the importance of digital preservation, a new project has been launched to digitally capture these artifacts using advanced 3D laser scanning and geospatial technologies. This initiative will generate:

   - **3D Point Cloud Data:** Providing highly detailed 3D representations.
   - **CAD Drawings:** Enabling precise measurements and analysis.
   - **Geo-tagged Databases:** Facilitating organization and accessibility.
   - **Immersive VR/AR Walkthroughs:** Creating engaging virtual experiences.

   This first-of-its-kind initiative in India was recently inaugurated by the Chief Minister of Karnataka, Shri Siddaramaiah. The 3D laser scanning of these precious antiquities is currently underway, promising to unlock new possibilities for their preservation and appreciation. **Karnataka's Treasures: Digitized for the Future!**

   - Geospatial mapping of **Traditional Surface Water Bodies** for restoration and rejuvenation. Mapped over 13,000 Traditional Surface Water Bodies across Karnataka, which includes Kalyani, Kunte, Gokatte and Katte**.** Based on the reports state government is taking up restoration works of surface water bodies under Jal Shakti Abhiyan and MGNREGA programs.

5. Energy Cell Initiatives

The Energy Cell focuses on promoting and disseminating renewable energy resources across Karnataka, including wind, solar, biomass, biogas, and mini/micro-hydel power sources. Key activities and achievements include:

Wind Energy:

- Established wind mapping and monitoring stations to identify potential sites for wind power generation.
- The data collected has facilitated the installation of over **5300 MW** of wind turbine capacity in the state.

Hydel and Solar Energy:

- Assessed potential sites for micro-hydel power generation.
- Provides end-to-end solutions for the installation of both on-grid and off-grid Solar PV power plants.

Bioenergy Initiatives:

- In partnership with the Karnataka State Biofuel Development Board (KSBDB), established **32** District Bio-Resource and Information Development Centers (BRIDCs) to provide technical support for bioenergy projects and programs.
- Provided Detailed Project Reports (DPRs) for solar rooftop lighting for the Institute for Social and Economic Change (ISEC) and Gulbarga University, Kalaburagi, during 2024-25.
- Organized a training program for project staff from BRIDC centres across the state in February 2025.
- Conducted brainstorming sessions for coordinators of BRIDC centres in March 2025, in association with the Gandhi Krishi Vigyan Kendra (GKVK), University of Agricultural Sciences (UAS), Bengaluru.
- Provided technical and financial support for **57** bioenergy project proposals.
- Facilitated internship projects for students under the Bioenergy Cell

Awareness and Advocacy:

- Organized World Environment Day.
- Organized a National Conference on Environmental Sustainability
- Conducts World Biofuel Day to promote biofuels
- Prepared amendments to the existing biofuel policy of Karnataka.

6. **Housing and Green Building Technologies**

   Energy-Efficient Building Technologies: The Council is actively involved in the research, development, and dissemination of cost-effective, energy-efficient building technologies. This work has resulted in the construction of over 100,000 houses across India and over 20,000 in Bengaluru alone. KSCST also conducts training programs for engineers and architects.

   Green Building Technologies: The construction industry faces challenges related to unsustainable extraction of raw materials and significant carbon emissions. Traditional building materials and construction methods often have high embodied energy and ongoing energy demands for maintenance. There's a growing need for low-carbon building materials and systems.

   Our initiatives in green building technologies include:

   - **Research and Development:** Exploring and developing innovative, sustainable building materials and construction techniques.
   - **Awareness and Promotion:** Educating stakeholders about the benefits of green building concepts and practices.
   - **Knowledge Dissemination:** Conducting workshops and training programs for building professionals to promote the adoption of energy-efficient green building technologies.

7. **KSCST's Patent Information Centre (PIC): Fostering Innovation in Karnataka**

   Since its establishment in 2005, KSCST's PIC has been instrumental in developing a strong Intellectual Property (IP) ecosystem in Karnataka. Key highlights include:

   - **Extensive Network:** PIC has established a network of 88 IP cells across universities and colleges, serving as hubs for IPR activities.
   - **Significant Impact:** These IP cells, with PIC's support, have filed over 2000 patent applications, resulting in 65 patents granted in the last 5 years.
   - **Widespread Outreach:** KSCST conducts 40-50 IPR programs annually, reaching over 10,000 participants.
   - **Capacity Building:** A "Training of the Trainer" program trained 80 IP coordinators from government colleges.
   - **Comprehensive Support:** PIC provides over 400 prior art search reports and supports Geographical Indication (GI) applications, registration, and commercialization efforts.

   PIC KSCST's multifaceted approach strengthens Karnataka's innovation landscape through education, support, and industry collaboration.

8. **Empowering Communities: KSCST's SC/ST Cell**

   KSCST has established a dedicated SC/ST Cell to promote the adoption of appropriate and relevant technologies, fostering socioeconomic development within Scheduled Caste/Scheduled Tribe (SC/ST) and marginalized communities. The Cell's key objectives include:

   - **Resource Assessment:** Evaluating natural and human resource endowments to identify opportunities for sustainable development.
   - **Skill Upgrading:** Providing training programs to enhance skills and employability.
   - **Micro-Enterprise Creation:** Supporting the establishment of micro-enterprises to create sustainable livelihoods.
   - **Farmers Training Program:** Conducted training programs for progressive farmers in the Kalyana Karnataka Region (**500** participants) focused on:
     - Doubling income
     - Integrated agriculture
     - Health and hygiene
     - Soil and water management

   To facilitate these goals, the KSCST has developed a specialized tool designed to identify locally-specific training and skill-building programs. This tool is instrumental in improving livelihoods and promoting the successful development of micro-enterprises within these communities.

9. **Addressing Malnutrition in Yadgir: Establishing a Fortified Food Processing Unit and Supporting SHGs / FPOs**

   To combat malnutrition, particularly among women and children, a fortified food production unit has been established in Yadgir. This initiative utilizes technologies developed by the Indian Institute of Science (IISc), the Indian Institute of Horticultural Research (IIHR), and the University of Agricultural Sciences (UAS).

   Trial production of four fortified food variants has been successfully completed through Self-Help Groups (SHGs):

   - Children's food
   - Adolescent food
   - Adult food
   - Family food

   Commercial production and marketing of these products are currently underway.

   The project has obtained FSSAI (Food Safety and Standards Authority of India) certificates for all four food variants produced in Yadgir. Furthermore, applications for product patents and trademarks have been submitted through the involved SHGs and AURO Centre for Public Nutrition (ACPN).

10. **Improving Tribal Livelihoods: Establishing Non-Timber Forest Product Collection Enterprises (NTFPCE) and Processing Units**

    To enhance the socio-economic well-being of tribal communities, KSCST initiated the "Non-Timber Forest Product Collection Enterprise" (NTFPCE) program. This program focuses on establishing non-timber product processing units in LAMP Society and LAMPS Federation in Karnataka.

    Under this initiative:

    - Honey, Amla and Sikakai processing units will be established in LAMPS Co-operative Federation, Mysuru.
    - A Sikakai processing and Honey bottling plant will be established in LAMP Society, Koppa, Chikkamagaluru.

    These units utilize technologies developed by the University of Agricultural Sciences (UAS), the Indian Institute of Horticultural Research (IIHR), and the Central Food Technological Research Institute (CFTRI).

    The program is supported by the Ministry of Tribal Affairs, Government of India (GOI), and the Department of Scheduled Tribe Welfare Development (STWD), Government of Karnataka (GoK).

    Key Objectives:

    - To provide a branded product and marketing platform for non-timber forest products, thereby increasing the income of tribal communities.
    - To provide training and capacity building to tribal communities in the collection, storage, and processing of NTFPs, promoting sustainable development.

11. **State Awards for Scientists and Engineers:**

    To encourage and recognize the contributions of scientists and engineers in the state, the Department of Science and Technology (DST), Government of Karnataka (GoK), instituted state awards in association with the KSCST. These awards, established in 1996, are named in honor of:

    - Bharath Ratna Sir M. Visvesvaraya
    - Dr. Raja Ramanna
    - Sir C. V. Raman
    - Prof. Sathish Dhawan
    - Dr. Kalpana Chawla

Since the inception of these awards, approximately **300** scientists and engineers have been recognized for their achievements. In the year 2023-24, a total of 28 scientists and engineers were selected to receive these prestigious awards.

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