Report

Science-Society-Setu for Aatma Nirbhar Bharat

(Web Clinic Series for cross-bridge-collaborations)

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Contents

CONTEXT

The recent unprecedented outbreak of COVID-19 affected the world and strongly impacted the livelihoods, health, nutrition and socioeconomic condition of the communities globally. When the lockdown was implemented, India saw reverse migration to villages and towns from metro cities. During this challenging time, GDP of India has declined by almost 23% in the first quarter of 2020-21 and more than 12 Crore jobs were lost.

Science for Equity Empowerment and Development (SEED) Division, Department of Science and Technology, Government of India with its extensive support has strengthened field-based S&T Voluntary Organizations and delivered technology solutions at the grass root levels. Sound social and economic infrastructures are essential for the overall development of the country. Appropriate translation of the technological interventions can greatly influence the overall growth. The outputs of field/action research projects supported under the various scheme/programs of SEED division has the potential to address the 'Vocal for Local' call of the Honourable Prime Minister.

In order to fulfil the goal of *Atmanirbhar Bharat Abhiyan*, solution-centric Science & Technology (S&T) interventions are essential with bottom up approach for identifying the problem that lack solution and top down approach for solutions on identified problems to develop and promote locally driven enterprises. The systemic gaps between S&T absorption capacity of the community, technological knowledge update of Voluntary & Community based Organizations and orientation of Knowledge Organizations (KO) need to be bridged.

SCIENCE-SOCIETY-SETU FOR AATMA NIRBHAR BHARAT- Web Clinic Series

In order to bridge the systemic gap, the Web Clinic series (S34ANB) was conceptualised to provide an online platform for establishing collaborations and dialogues between ecosystem partners viz. S&T based Voluntary Organizations (NGOs), Knowledge Organizations (KOs), Social Start-ups, Grassroot Innovators and Communities for STI based appropriate solutions.

Objectives

- Harnessing & Science, Technology & Innovation (STI) for better quality of life and livelihoods with equity & inclusiveness for socio-economic well-being
- Strengthening & advancing STI capacity of NGOs and Communities involving S&T Knowledge Organizations & other stakeholders for catalysing self-reliance
- Identifying new ideas and partners to bridge systemic gaps and evolving schemes
- Fostering public-private linkages for creating social entrepreneurship and start-ups directed towards indigenous & sustainable technologies

Focus

The virtual interaction focussed on five sectors in alignment with *AtmaNirbhar Bharat Abhiyan* namely, Agriculture and allied, MSME, Economy, Social Infrastructure and Cross-sectoral areas.

The Web Clinics have been organized on 2 days per week during 15th Oct 2020 to 4th Dec 2020 in two separate streams. During 1st day of the event, experts from KOs interacted with NGOs & Communities for transferring available indigenous and advanced technologies for better livelihoods, improved quality of life and social entrepreneurship and on the next day, experts from NGOs & Community representatives interacted with faculty of KOs for highlighting the local problems and exploring possible collaboration for required S&T based solutions.

Implementation

SEED Division – DST in collaboration with Office of Principal Scientific Adviser (O/o PSA), Vigyan Prasar (VP), Federation of Indian Chambers of Commerce & Industry (FICCI), Accelerating Growth of New India's innovations (AGNIi), World Wildlife Fund (WWF)-India & Himalayan Environmental Studies and Conservation Organization (HESCO) successfully conducted S^{3}4ANB web-clinic series over 8 weeks. It was implemented and managed by India Science, Technology and Innovation (ISTI) Web Portal. The details of this effort are uploaded on ISTI Web Portal [https://indiascienceandtechnology.gov.in/science-society-setu].

The initiative intended to reach the unreached towards effective alignment of Technology, Knowledge, Skills and Resources at local level leading to strengthen the 'Social Infrastructure' and 'Technology Driven System' pillars of the AtmaNirbhar Bharat. In long term, this collaborative development through *Science-Society-Setu*will provide self-sufficiency not only to communities, but also contribute towards scientific development in the country pertinent to recently announced roadmap of AtmaNirbhar Bharat.

During the web- clinic series, a total number of 7 Ministries, 3 International Organizations and 123 speakers/panellists from 90 Institutions (including total 89 new speakers/panellists from 63 new Institutions) across the country have shared their knowledge, experiences and deliberated on opportunities of technical interventions and possible collaborations. Around 22000 number of targeted audiences were reached directly by using various digital media platforms namely, GoToMeeting, Facebook, Youtube Channel of Vigyan Prasarthrough ISTI Portal. Worth mentioning here, that total 160 no. of Social media posts on Twitter & Instagram were generated. List of Stakeholders involved in Web Clinics is in **Annexure I.**

LESSONS LEARNT

After organising 8 weeks of the web-clinics, following take home points emanated-

- **Cross-bridge Collaboration**: Initiated networking and cross-bridge collaborations among KOs, NGOs and communities for hand-holding, technology development, standardization, and information dissemination to address systemic gaps.

- **New Partner Identification**: Identified new Experts, new Institutions, Resource Groups, User Groups and new collaborators at Global, National and local levels to strengthen STI based local development, Equity and Inclusion.

- **New Ideas and Technologies for Systemic Intervention**: Identified new ideas, emerging technologies, priority areas and many technologically feasible and economically viable solutions for improving the livelihood systems and social entrepreneurship. Technology must improve the weakest link and utilize the strongest link of Livelihood System. Technologies available with KOs that require dissemination and community accessibility and Technologies available with NGOs, Start-ups and microentrepreneurs that require supportare available in **Annexure-II**.

- **Need for Social Capital strengthening through STI**: Social Capital includes human resources and demographic dividend. The triple deficiency in social capital development viz. dietary, information and market should be addressed through Science Technology and Innovation (STI).

- **Acceptability of *Setu* Concept**: Ministries, International Organizations, Knowledge Organizations, and NGOs have come forward to take this concept of *Setu* in cross bridging the science and society to cater the emerging needs.

CHALLENGES

- Difficult to attract Knowledge Organizations (KOs) for listening to the farm/non-farm level problems and challenges shared by NGOs requiring S&T based solutions.

- Technical challenges to reach out to communities and bring them for dialogues to capture their changing aspirations.

- Making the platform interactive to benefit the stakeholders.

OPPORTUNITIES IDENTIFIED

The web clinic series resulted in identifying opportunities for further consideration. Two types of opportunities had emerged, a) **Interventions for providing relevant solutions**, and b) **Collaborative Opportunities**.

A. Intervention Opportunities

The interventions include a) emerging technological solutions that is socially relevant, locally appropriate and environmentally sustainable; b) standardisation, upscaling, capacity building and dissemination of technologies and c) bridging the systemic gaps for livelihood system strengthening and social entrepreneurship development (**Annexure-III**).

Such interventions have been identified in all four sectors during the web-clinic series.

a). Livelihood System Strengthening

- Creating "Land to Lab" programme for knowledge co-creation between community and scientists.
- Need for mapping various livelihood systems with updated appropriate technologies.
- Around 400 technological interventions identified which are at various level of readiness and for community accessibility. The details of these interventions are available at https://indiascienceandtechnology.gov.in/science-society-setu. **These interventions need to be taken forward through SEED Division, DST.**
- Developing programme for improving/upscaling the locally produced Technologies by NGOs and Start-ups with KOs
- Optimization of Farm productivity and environmental performance should be considered for Sustainable Development at local level in the projects.
- Introduction of emerging technologies for livelihood system management eg. creating Electronic History Record based Digital Health Care Delivery and mainstreaming of Tribal Health Care System.
- Capacity building of community in emerging technologies through involvement of students eg. Output of eYantra project (robotics in Agriculture) developed by IIT Bombayhas potential and need to be disseminated to farmers through Agricultural students.

b). Social Entrepreneurship development

- Establishing One-stop Technology Marts for NGOs, KOs and Community.
- Establishing virtual technology Incubation facilities and local innovation centres across the Nation.
- Capacity building in local manufacturing and scaling up of technologies at manufacturing level for mass production.
- Validation and Certification of rural products from accreditation organizations.
- Connecting Start-ups in livelihood sectors with SEED programme.
- Establishing linkages between industries, KOs, solution providers, regulating authorities with focus on funding gaps for technology scaling up.

- Creating and amplifying business opportunities for inclusion of partners from KOs in the private sector like Facebook, KPMG, impact investors, VCs, and others in the domain.

B. Collaborative Opportunities

This web-clinic series gave an opportunity for knowledge co-creation and knowledge sharing of existing best practices and further handholding through various collaborations, like inter-Ministerial collaborations with Ministry of Micro Small and Medium Enterprise (MoMSME), Ministry of Panchayati Raj (MoPR), Ministry of Rural Development (MoRD), Ministry of Tribal Affairs (MoTA), Line Departments like Animal husbandry Department (AHD), Fisheries, Industry Associates viz. FICCI, Deshbandhu Foundation, Reliance Foundation, Tata Trust and others stakeholders. Similarly, international organisations, like United Nations Development Programme (UNDP), United Nations Industrial Development Organization (UNIDO), International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) participated and evinced interest in collaborating with DST as well as with KOs in providing technological solutions to the end-users and society.

Complete list of **Inter-ministerial** collaboration, **intra-Divisional** (within DST and other Departments) collaboration and collaboration **among various stakeholders** like Knowledge Organizations and NGOs, KOs -NGOs, NGO-Startups, NGOs-NGOs, KO-NGOs-Startups, KO-Communities, KO-NGO-Startups-Communities, CSR-NGOs-Communities is available in **Annexure- IV.**

WAY FORWARD

a) Already Initiated actions

- Collaboration between Office of PSA, DST an MSME in SFURTI and ASPIRE programmes has been initiated.
- Partnership between DST and Institute of Livelihood Research and Training (ILRT) for "**Asia- Agritech Challenge-2020**" is operational.

b) Actions Planned

- Launching of a new National Mission "*Science-Society-Setu Mission*" under the aegis of Office of PSA.
- Development of a *framework* for cross-bridging identified interventions and connecting them with sustainable developmental goals and integrating them into different programmes of SEED Division, DST.
- Establishing *mechanism* to translate the identified opportunities into long-term and intermediary terms actions to improve the S&T absorption capacity of the communities.
- Standardization and certification of the Ready to Transfer products through central facilities such as *Sophisticated Analytical & Technical Help Institute (SATHI)* or creation of such facilities at community level.

- Creating an *interactive platform* for project development, knowledge transfer and identifying opportunities for technology driven social entrepreneurships and enhancing ISTI portal into National Central Technology Database for showcasing the ready for scale-up technologies and solutions.
- Establishment of decentralized *Innovation Hubs and Technology Marts* at different levels.
- Establishment of STI Knowledge Hubs at local level to innovate and build capacity for addressing the triple-deficit for improvement of social capital.
- Developing resource Material targeting communities and NGOs (Instructional design, Tool Kit/ Handbook, Awareness Material, etc.).
- Effective product development and enterprise creation through *Public Private Partnership (PPP)* or *Technology Business Incubation (TBI)* and creating market linkages for these products through various digital platforms such as 'Mera Mobile Mera Market' etc.
- *Microgrant scheme* for NGOs and Innovators to be redesigned for grass root level support and funding.
- Organizing meetings with the stakeholders participated in the Web clinic series for initiating necessary actions.
- Organizing meetings with the communities through Core support Groups (CSG) of SEED division to understand the requirement of capacity building process and building the S&T capacity of smaller Community Based Organizations (CBOs) and local KOs to make them self-reliant for solving the problems of communities at grassroots.
- Developing network projects viz. ICAR-CIFA with NGOs for fingerling fish production and distribution in aspirational districts in Odisha.
- Linking CSGs of SEED Division with State S&T Councils, Patent Information Centres and State Spatial Data Infrastructure (SSDIs) for systemic STI delivery at community level.
- Collaboration with National Innovation Foundation (NIF) for upscaling local innovation through programmes of SEED.
- Strategies to be developed for creating the linkages with Patent Facilitation Centre (PFC), TIFAC for improvement of Geographical Indication (GI) products through STI.
- Development of the programs under SEED in tune to the findings of the "Mapping the S&T needs" projects of the State S&T councils.
- In order to further develop the new ideas identified through S^34ANB, further sectoral brain-storming should be organized with relevant stakeholders.

Annexure-I

Stakeholders involved in Web Clinics

a) Ministries & Departments

Ministry of Science & Technology (MST), Ministry of MSME, Ministry of Animal Husbandry (MoAH), Ministry of Food Processing (MoFP), Ministry of Agriculture (MoA), Ministry of Panchayat Raj (MoPR), Ministry of Tribal Affairs (MoTA), Ministry of Electronics and Information Technology (MietY), Ministry of Development of North-Eastern Region (MDoNER), Council of Scientific and Industrial Research (CSIR), Indian Council of Agricultural Research (ICAR), Indian Council of Medical Research (ICMR).

b) International Organizations

United Nations Development Programme (UNDP), United Nations Industrial Development Organization (UNIDO), International Crops Research Institute for the Semi-Arid Tropics (ICRISAT).

c) Knowledge Organizations

IIT Kharagpur; IIT Delhi; IMD; ICAR- Central Institute of Agricultural Engineering (CIAE), Bhopal; CFTRI, Mysore; Central Institute of Post-Harvest Engineering (CIPHET), Ludhiana; Central Research Institute for Jute and Allied Fibres (CRIJAF); IIT, Bombay; CSIR-Central Food Technological Research Institute (CFTRI), Mysore; Centre for Technology Alternatives for Rural Areas (CTARA), IIT, Bombay; Central Mechanical Engineering Research Institute (CMERI), Ludhiana; ICAR-CIFRI; Central Avian Research Institute (CARI), Izatnagar, Bareilly; Central Institute of Freshwater Aquaculture (CIFA) ICAR, Bhubneshwar; NIT, Puducherry; ICAR-CIRG, Mathura; Regional Eri Research Station(RERS), Meghalaya; CIPET, Bhubaneswar; CSIR HQ, Delhi; IIT, Madras; IIT, Mandi; , IIT, Bombay; CSIR-NIIST, Kerala; IIT, Guwahati; The Synthetic & Art Silk Mills' Research Association (SASMIRA), Mumbai; IHBT, Palampur; ILRT, Hyderabad; IIT, Roorkee; IKP Knowledge Park, Hyderabad; IIT, Kanpur; IIT Bombay; KIIT University, Bhubneshwar; LYNK AmbuPod Pvt Ltd; Foundation for Innovations in Health, Kolkata; National Institute of Rural Development and Panchayati Raj; National Innovation Foundation (NIF), Ahmedabad; CSIR-National Botanical Research Institute (NBRI), Lucknow; Rajiv Gandhi Science and Technology Commission, Maharashtra; TERI School of Advanced Studies.

d) NGOs, Start-Ups & Knowledge Park CSRs and Industry Associations

Ramakrishna Mission Ashrama, Ranchi; BAIF, Pune; Development Action (PRADAN), New Delhi; World Wildlife Fund (WWF-India); Gorakhpur Environmental Action Group (GEAG), Gorakhpur; M S Swaminathan Research Foundation (MSSRF), Chennai; Professional Institute for Development & Socio Environmental Management (PRISM); Barefoot College, Rajasthan; KVK-Krishi Vigyan Kendra, Bhavnagar; Purvottar Development Society, Guwahati; Unati Cooperative Marketing- Cum- Processing Society, Talwara; BAIF, Pune; VIB, Nimpith; NBIRT, Tripura; HRG, Shimla; DA, Delhi; Vigyan Ashram, Pune; Desert Resource Centre, Bikaner; Centre for Indian Bamboo Resource and Technology (CIBART), Gujarat; Reliance Foundation; Social Alpha/ Tata Trust; COO Education, CSC e-Governance Services Ltd.; MGIRI, Wardha; Digital India Corporation; Er. Perumal Manimekalai College of Engineering, Hosur; Deshbandhu Foundation, Hughli; Ishita Khanna, Ecosphere, Spiti; Deshpande Foundation, Hubli; Puppala Foundation of Ecological Security (FES); Facebook; Techno Venture Pvt Ltd., Nagpur; Phool.Co, Kanpur, Project Moo farms, Naireeta Services Pvt. Ltd.; SatSure, Bangalore; LYNK AmbuPod Pvt Ltd.; White Gold Technologies LLP; Ecoideaz; New Leaf Dynamics, Delhi; IKP Knowledge Park, Hyderabad; S&T Park, Pune; Country Accelerator Lab, SatSure, Bangalore; Climber Engineers, Pune; RuKart Technologies Pvt. Ltd., Mumbai; New Leaf Dynamics Technologies Pvt. Ltd., Delhi; White Gold Technologies; BioReactor Start-up; Upaya Engineering (Pondbot); Tata Trusts Mumbai; FICCI, Delhi

Annexure-II

Technologies available with KOs require dissemination and community accessibility

a) Agriculture and Allied Sectors

Agro-meteorology forecasting, Agri-clinics, Jaggery production, Agribot, Bio-fortification of food, Jute and allied fibres, Seed and fibre processing, KoBoToolbox for agriculture based data gathering, Raised based methods, Soil less nursery, Polythene mulching, Cultivation with Trellis, Multi-layer farming, Solar irrigation, Solar Tunnel Dryer, Probiotic and Prebiotic products, Automatic wadi making machine, Quality Sensing System for Mushroom, Green Pea De-podder Machine, Fully Automatic pneumatic controlled Custard apple Pulper, Millet thresher-cum-pearler, Meat preservation technology (retort pouch processing technology), Poultry (widespread use of diagnostic kits & vaccination), Microwave assisted disinfestation of food grains, Precision in Seed Metering Technology, Precision spraying, Integration of sensors for increasing efficiency in Tractor-Implement System, Recirculation aquaculture systems (RAS) System of fish culturing, climate resilient pen culture, Carp fingerling production, establishing FRP carp hatchery set up, Silk worm rearing, Hydroponics for green fodder,Sensor based Modern Aquaculture system, etc.

b) Social Infrastructure Sector

Hearing Disabilities Aid, Text to Speech, Speech to Text, Indian Picture Library, Indian Sign Language, Software's for communication, education in Indian accent and Indian languages, Accessible and affordable assistive devices, Swasthya (Tribal Health & Nutrition) Portal, White-Fi for broadband connectivity, Spoken Tutorial (ST) Project, DigiBunaiand e-Galla, Frugal 5G Network, Sanyog model (IIT KGP), Zig-zag brick kiln technology, Akash-Bani for special access switches for Divyangjans, etc.

c) MSME and Economic Sectors

Robotic Milk Collection Unit, Livestock enterprises (fodder nursery, silage making, heifer production), Jaljeevika-Azadi model (Integrated Aquaculture System), Eco-Shiksha Model, Aqua-school Model, Sundarban Honey Bee model (Apiculture), Innovative Technology Solution for food value chain, UNDP technologies for climate resilient livelihood (IoT & Blockchain), Biodegradable cutlery products from Agro-waste, Pine needle based technologies for rural startups, Farm based drying technology, Agri-food, Agri-business incubator, Micro solar dome, TBI Model, Rural WTP model, Forest bio-residue based energy generation, AgriBPO model etc.

d) Cross Sectoral areas

Digitalized Hub and Spoke model for Artisan Clusters, Virtual Reality, Augmented Reality and Mixed Reality, Soil and Water Testing, Bio-inoculant Producer, Soil Pollution Monitoring, Greenbelt Development for Industries, KisanMitr digital platform, KALAMITR for non-farm collaborations, technology enabler and marketing, FAARM- data driven technology for agri-ecosystem etc.

Technologies available with NGOs, Start-ups & Microentrepreneurs and support required

a) Agriculture and Allied Sectors

Riverbank erosion and erosion of embankments, Modernizing fisheries, Early warning system-Animal Intrusion and detection system, Climate/disaster resilient agriculture-science Branding of local resource-based manure, pesticides/repellent, Resilient seed and varieties, Sensor-based cost-effective irrigation system, multi-layer farming for enhancing production, GI- drive micro-planning for drainage-quick water flow, e-learning clinics, Controlled polyhouse, Aquaponics, Species & stock enhancement in fisheries, Integrated fish farming (like duck-cum-fish, horti-cum-fish, pig-cum-fish), Improving Soil, Agro-processing, Grey Water recycling, Portable bio-reactor etc.

b) Social Infrastructure Sector

Social Alpha Model, Low cost housing using alternate and eco-friendly construction technologies, Rejuvenation of water resources (like springs), Water harvesting technologies, Development of watersheds, Soil conservation, Treatment of hillocks for high value horticulture, Uday Software for public health, Energetic & Cognitively Strong Social Capital, Grey water recycling for small hamlets/ colonies, Portable work-bench for rural schools, Health care infrastructure (IIT KGP), Sustainable housing models (Habitat Technology Group) etc.

c) MSME & economic Sectors

Bioresource based microenterprise models for livelihood diversification in mountain areas from Jagriti&Kullu, Construction & demolition waste to technology, Retrofittable Instant Milk Chilling System for Bulk Milk Cooler, Gree Chill- refrigeration system out of farm waste, 'Usharmukti' and river rejuvenation (hydro-geology) model, Burnt clay Brick Hollow piers on common shallow foundation, GIS & Remote sensing,Digitalized Hub and Spoke model for Artisan Clusters, Virtual Reality, Augmented Reality and Mixed Reality, Bio-reactor, Precision Farming, Renewable Energy in Food Processing, Eco-friendly Construction/Green Buildings, improving shelf life using Radiation Technology in Food Processing, S4S technologies by MILAP-FICCI, GOAL Facebook- for capacity building and empowerment of the communities etc.

d) Cross-Sectoral areas

Herbal drug & food processing industry, 'Mera Mobile Mera Market' model, Technologies to reduce occupational hazard and environmental pollution, Natural resource mapping, Water management and watershed development etc.

Annexure-III

Intervention Opportunities

a) Benefit to Small and Marginal farmers

Technology development for lowering input costs to agriculture (Bio-manure/pesticides, seed, irrigation and monitoring), Enhancing productivity & reducing losses (climate resilient farming, GIS driven microplanning) to double farmer's income, use of local resources, Integrated organic farming, Local manufacturing, Standardization, Scaling-up of technologies, Agri-clinics etc.

b) Creating new market, local development and value networks

New/emerging technologies like bio-fortification of food, Jute and allied fibres seed and fibre processing, Agri-clinics, Livestock, Fisheries, Poultry, Meat preservation technology, silk worm rearing technology, IoT based water quality management system, Milk adulteration technology, disruptive technologies (like data analytics, silk worm rearing technology) etc. for creating new market, local development and value network.

c) Location specific livelihood opportunities

Tele-Medicine/Herbs, Rejuvenation of water resources, Safe & contamination free drinking water, Education, Health & Nutrition, Vermicompost, Biopesticide, biofuels, Biodegradable Cutleries, Pine needle pellets, Livestock enterprises (fodder nursery, silage making, heifer production) etc.

d) Micro-entrepreneurship models and rural technology incubators

Jaggery production; Agribot; Social Alpha Model; Bioresource based microenterprise models for livelihood diversification in mountain areas from Jagriti, Kullu; Construction & demolition waste to technology; Scaling up of Spoken Tutorial (ST) Project; Portable work-bench for rural schools; Sustainable housing models with Habitat Technology Group; Facilities for Ambumanpac, Ambumotopac, Ambuclinic with LYNK Ambupod; Jal-Jeevika-Azadi Model (integrated aquaculture system) and Sensor based modern aquaculture system, Aqua School Model, Eco-Shiksha (Ecology and Farm learning), Meadows high (Hydroponics for green fodder), Sundarban Honey Bee model of Apiculture, SARVAAY start-up for Hygienic and chemical free jaggery processing technology. Knowledge dissemination on Technology Mart Model with Rural technology Action Group (RuTAG) of IITM; Ready-to-use technologies of IHBT (Sustainable utilization of Himalayan bioresources); Emerging technologies from DIC-IIT Roorkee for Himalayan Region; Innovative interventions for rural, micro & small industries by MGIRI-Wardha; Grassroot & need based technologies from ILRT-Hyderabad and Clean energy technologies for energy resilience

e) Livestock based enterprises

Emerging technologies for diagnostic testing & selection for productive breeds; Fodder nursery, Silage making, Heifer production; Establishing & maintaining ecosystem of livestock management; Robotic Milk Collection Unit; Amalgamation of physical & digital technologies for strengthening dairy value chain; Sex-sorting technology, Superior Germplasm, Breed conservation, Genomics application in livestock breeding, Advanced preparedness for Zoonosis, Disease diagnostics technologies.

f) Skill development and income generation programmes

Soil and Water Testing Lab Analysts, Plant Tissue Culture Technician, Gardener, Bio-inoculant Producer for Agricultural Application, Quality Analysts for Herbal Industry, Phytochemicals Analysis Technician, Technician for Molecular Biology and Bioinformatics, Pollution Monitoring:

Soil Pollution, Greenbelt Development for Industries, CHICK TM & CAD, E-GALLA, Digital Designer Bunai Software etc. from Digital India Corporation.

Annexure-IV

Collaborative Opportunities

a) Inter-Ministerial Collaboration

- **Ministry of Electronics and Information Technology (MeitY)** for digital technologies to embed several ecosystem models in respective services areas and for empowering the citizens utilising scientific interventions through Community Service Centres (CSCs).
- **Ministry of Development of North-Eastern Region (MDoNER)** for disseminating knowledge through Swasthya (Tribal Health & Nutrition) Portal
- **Ministry of Tribal Affairs (MoTA)** for Eklavya Ashram schools & e-education scheme, Research on Sickle Cell Anemia/Genetic Issues, Validation of Tribal Medicine/Herbs, documentation of ITK practices and Scientific Validation and Documentation. Capacity building & knowledge dissemination through national tribal migration support portal.
- **Ministry of Panchayati Raj (MoPR)** for establishing a National Gallery for community/society at National Institute of Rural Development and Panchayati Raj (NIRDPR) and for creating a **portal** for showcasing the big impact technologies aimed at mitigating problems in rural areas and to promote technology-based entrepreneurships.
- **Ministry of MSME** for integration of available technologies with Scheme of Fund for Regeneration of Traditional Industries (SFURTI) scheme, Gram Vikas Yojana (GVY) and A Scheme for Promotion of Innovation Rural Industry & Entrepreneurship (ASPIRE) Yojana.
- **Office of PSA** for exploring partnership in APP development on *KisanMitr* to enable technologies at field level and collaborating with *KisanMitr* digital platform for agri technologies developed under SEED Division.
- **Ministry of Rural Development (MoRD)** for linking with Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) and Pradhan Mantri Adarsh Gram Yojana (PMAGY) (e.g. Manufacturing of fly ash bricks can be taken up in areas where fly ash is available and should be linked with construction activities of these schemes).

b). KO-NGO collaboration

The KOs should look at the technologies for improvisation or modulation as per the needs of the target area or can develop efficient and cost-effective technologies. KO and NGOs may collaborate for the following technologies/models:

- Ready-to-use technologies of RuTAG of IITM & IITG for dissemination through NGOs;
- Capacity building programmes & promoting women entrepreneurship with MGIRI-Wardha;
- Upgradation of Micro-enterprise maturity model (e.g. Social Alpha Model);
- Embedding of high-end emerging technologies of KOs with Reliance Foundation;
- Digital India Corporation for capacity building on various software of digital designing (such as DigiBunai and e-Galla etc.);
- eYantra Project for contract research along with agriculture universities;
- Linkage of Vivekananda Institute of Biotechnology (VIB) with food technological institutes for testing quality of honey;
- Linkage of NGOs with IMD, MNCCFC and CFTRI for integrated technology intervention and Social engineering.

- Upgradation of Uday software for Early detection of life-threatening diseases and its dissemination in other rural areas through NGOs/KOs.
- Linking between Mahalanobis National Crop Forecast Centre (MNCFC), Naireeta Services, Central Institute of Agricultural Engineering (CIAE) and NGOs for creating test beds.
- Network project in collaboration of ICAR-CIFA and NGOs for fingerling production and distribution in aspirational districts in Odisha.
- Standardization of designs and technologies (e.g. Fan Pad System in polyhouse designed by Vigyan Ashram
- Capacity building of NGOs through Spoken Tutorial (ST) Project;
- Sensors/AI –ML applications is needed for Monitoring of water flow rate, air & water temperature, dissolved oxygen, ammonia etc.;

c) KO-NGOs-Startups Collaboration

- KOs, NGOs and Start-ups may have collaboration with the **RuTAG (IIT-KGP, IIT-D, IIT-M, IIT-B, IIT-K), IHBT &AGNIi**for S&T interventions/Technologies/land to lab models developed on problems associated with marginal communities in rural areas (such as clean energy, healthcare infrastructure technologies etc.) and for replication, upgradation, manufacturing, marketing and promotion of these technologies.
- **Karnataka Nutrition Mission**for reducing the number of children suffering from malnutrition;
- **Gram Marg Model**for affordable broadband connectivity to rural India;
- **Telemedicine Model** for comprehensive rural health services may be replicated as sustainable business models through public/ private and Panchayat partnership.
- Success stories of **Reliance Foundation** may be replicated to inculcate technological interventions into practice;
- **AgriBPO model** of ICT interventions may be promoted for entrepreneurship development.
- Innovations from **AGNIi** on various livelihood sectors will establish the ecosystem, support manufacturing & reaching out to communities.
- **Panchayats & Rural Development Deptt, West Bengal** may collaborate for institutionalizing the interventions in MGNREGA.
- Technology of IoT based water quality management system in aquaculture from NIT-Puducherry may be transferred to interested CSGs (e.g. Vigyan Ashram, Pune).
- **PRADAN** organization is in discussion with the PSA office for the **'AtmanirbharKisan App'** and need partnership in Mango nursery raising, Gas Ripening chamber for Mango & Banana, Sprinkler installation in Net shed, Online system for rate display & market information, Online platform for farmer-market connect;
- **UNDP Acceleration Lab** products eg. Blockchain for Indian Spices, Filterless Technology for PM reduction, Targeting Hotspots of Air Pollution from Space, Breathing Roots technology, A2P ENERGY: Making NextGen biofuels from Agri waste, Paddy Straw value chain may be scaled with partnership.
- **Agri-Business Incubator (ABI) of ICRISAT** may collaborate with NGOs for disseminating the technologies such as IoT & AI-enabled smart farm smart farm resource management tools, Autonomous aerial spraying drones, Rugged multi-terrain robots etc.

d) NGO-Startups Collaboration

- **Organizations** such as BAIF, Pune; HRG, Shimla; STD, Mandi; VIB, Nimpith; TIDE, Bangalore; Development Alternatives, Delhi; Jagriti, Prantik Care, Enable India, Saksham Trust, Deshpande Foundation etc. working on emerging technologies may collaborate for start-ups.

- **Technological interventions** such as value creation in pine needles, medicinal & herbal plants, forest bio-residue based energy generation and business models such as Spoken tutorials; Social Alpha; Phool.Co; Project Moo farms; Naireeta Services Pvt. Ltd.; SatSure; LYNK AmbuPod Pvt Ltd.; White Gold Technologies LLP; Ecoideaz; New Leaf Dynamics; IKP Knowledge Park, Hyderabad; S&T Park, Pune; have been found for collaboration and socio-economic value creation.
- **Milk adulteration technology** can be introduced by NGOs in a cluster mode to communities.
- CTD-Delhi, a Core support group may disseminate the **success stories** of grassroot technology & enterprise models emerged from Web Clinics.
- Start-ups eg. Retrofittable Instant Milk Chilling System for **Bulk Milk Cooler**, **Green Chill**-refrigeration system out of farm waste etc. may be given a chance to collaborate with NGOs for better outreach and profit.
- The **Circular Economy model** may provide sustainable farm production & new livelihood opportunities in rural regimes.
- RuKart started with the **Subjee cooler** to increase shelf life of vegetables and frequency of harvesting. Embedded IoT Web App support for monitoring, control and marketing.
- **KALAMITR** for non-farm collaborations, technology enabler and marketing;
- ***FAARM***- data driven technology for agro-ecosystem;
- Bridging the Gender Divide through **Digital Beti**;
- Organisations like **FICCI** may address the challenges in scaling up technologies at manufacturing level for mass production.


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