2024 Women Leadership in STEM:

Leadership Projects

Grand Challenges India

बाइरैक
birac

DEPARTMENT OF BIOTECHNOLOGY
Ministry of Science & Technology

WomenLift Health

About Biotechnology Industry Research Assistance Council (BIRAC)

Biotechnology Industry Research Assistance Council (BIRAC) is a Not-for-Profit, Section 8, Central Public Sector Enterprise set up in 2012 by the Department of Biotechnology under the Ministry of Science and Technology,Government of India. BIRAC's mandate is to strengthen and empower emerging Biotech enterprises in India. The organization is committed to promote, nurture and enable the Biotech Innovation Ecosystem for development of globally competitive, affordable products to address the unmet needs of society at large. BIRAC's strategic and systematic efforts have led to the establishment of a robust and prominent biotech innovation ecosystem in the country. Through Public-Private Partnerships, BIRAC has taken up a multitude of activities, ranging from funding high-risk translational research, supporting nascent ideas, capacity building, and creating shared infrastructure by setting up specialized bio-incubation centers, handholding through mentoring and training to policy advocacy, all aimed at accelerating growth of the biotech innovation ecosystem in India. Through funding, partnerships, and translational support, BIRAC drives innovation and strengthens India's bioeconomy, accelerating its growth toward the USD 300 billion target by 2030.

About WomenLift Health

WomenLift Health aims to expand the power and influence of women leaders to transform health outcomes and be change agents for inclusive leadership. WomenLift works through regional hubs in East Africa, India, Nigeria, North America, and Southern Africa to deliver contextualized leadership development programs to serve mid-to-senior career women leaders, equipping them with tools, networks, and support systems to navigate their paths to the highest decision-making levels in health. It supports health institutions and their leaders to advance gender equality and is a thought-leader, generating evidence and supporting national and global convenings to contribute to societal change.

About Grand Challenges India

Grand Challenges India (GCI) is collaborative initiative between the Department of Biotechnology (DBT), Government of India, and the Gates Foundation, instituted following the signing of a Memorandum of Understanding (MoU) in 2012. The collaboration aims to foster scientific and technological innovations that address some of the most pressing global health and development challenges, with a focus on benefiting people in India and other developing nations. The initiative creates opportunities to launch and support research and innovation programs and to strengthen India's translational research capacity by promoting the development of scientific and technological solutions. GCI is housed in BIRAC as a Project Management Unit to oversee and implement the above activities. In addition, GCI plays a vital role in enabling capacity building for researchers and innovators, equipping them to contribute more effectively to addressing global and local challenges.

About Women Leadership in STEM (WLS)

The Women Leadership in STEM (WLS) programme is a leadership development initiative jointly launched by Grand Challenges India, Biotechnology Industry Research Assistance Council (a partnership between the Department of Biotechnology, Government of India and Gates Foundation) and Womenlift Health. It is designed to empower mid-career women professionals working in Science, Technology, Engineering, and Mathematics (STEM) roles across public or private institutions in India. Developed in collaboration with the Center for Creative Leadership, the programme includes residential workshops that equip participants with essential tools and frameworks to strengthen their leadership styles, expand their influence, and foster an inclusive network of women leaders in STEM in the country.

WLS focuses on driving mindset change and fostering skills and behavioural among participants, which were monitored throughout the year with support from MEL partners Bixal to determine its efficacy in improving eight key leadership outcomes for women STEM leaders in India. These outcomes include:

Confidence and Courage

Demonstrates inner strength and willingness to act in challenging situations.

Leader Identity

Projects a clear sense of self, including awareness of the components that drive a leader's intent, behavior, and impact on others.

Developing Others

Actively works to build the capacity of others.

Leadership Presence

Recognised as a sincere, authentic, and trustworthy leader.

Ecosystem Mindset

Adopts a global vision, embraces transformational thinking, and applies cultural intelligence.

Relationship Building

Develops and nurtures inclusive, meaningful relationships with discernment.

Leader Agility

Leads change with big-picture thinking, discernment, and versatility.

Resilience

Sustains energy and a growth mindset and adapts to challenges while leading.

The Leadership Project

The Leadership Project is an opportunity for WLS cohort members to design and lead an effort that taps into their expertise, network, passion, and creativity.

Participants enter WLS with a project idea and develop a Theory of Change, stakeholder analysis, and implementation plan with the guidance of their mentor, coach, and STEM experts in India. The implementation phase of the project begins in the latter half of the programme Finally at the Lift-Off event, which marks the conclusion of the programme, each cohort member presents a summary of their Project's development and early outcomes. Implementation of the Project does not have to be fully complete by the end of the programme and will likely continue beyond it.

Projects lie at the intersection of STEM outcomes, health equity, and gender equality and fall under one or more of the following themes:

1. Building Integrated & Resilient Health Systems
2. Catalysing Institutional Change
3. Centering Women and Girls in STEM
4. STEM Innovation and Policy
5. Optimising Pathways for Leadership

Building Integrated & Resilient Health Systems

Anmoldeep Randhawa
Assistant Professor,
Amity University Punjabi

A Women-Centric Biotech Enterprise to Provide Affordable Healthcare

Background

India faces a significant accessibility barrier in the domain of biotherapeutics. While these represent the safest treatment alternatives for various disorders, they are often unaffordable due to high production costs. The current manufacturing models for therapeutic proteins, particularly multi-subunit proteins with disulfide linkages , are both resource-intensive and cost-prohibitive. This has resulted in limited availability of such critical treatments in the Indian public healthcare system.

Innovation

The Project originated from a research initiative focused on enhancing the productivity and affordability of protein-based therapeutic manufacturing in India. Through this effort, **a prototype was developed that utilises a simplified two-step purification process—affinity chromatography followed by protease cleavage —for the production of correctly folded multi-subunit proteins. This method led to a tenfold increase in productivity compared to conventional patented techniques and significantly reduces production costs.** Specifically, the innovation was applied to the development of a biosimilar for autoimmune joint disorders, utilising unique affinity tags to improve the yield of folded protein complexes.

Advancing Women and Girls

Alongside the scientific innovation, **the Project addresses the critical underrepresentation and underemployment of skilled female biotechnologists in North India.** Despite strong academic and research backgrounds, many of these professionals remain sidelined due to institutional barriers and societal expectations. In response, a cohort of six women scientists,

including experts in biotechnology, molecular biology, genetics, and chemistry, came together to establish *Matriarchs Bioworks* in Mohali, Punjab. Registered under the Startup India scheme, the enterprise is built on a gender-inclusive framework that promotes women's leadership and autonomy.

The workplace model is designed to support the holistic well-being of its employees by offering flexible schedules, childcare and health provisions, profit-sharing opportunities, and recognition of intellectual contributions through patent rights. The Project not only delivers an impactful technological solution but also pioneers a transformative model for women-led enterprise in the Indian biotechnology sector.

Early Successes

- Developed a prototype biosimilar with enhanced productivity and simplified purification steps.
- Established *Matriarchs Bioworks*, a biotechnology startup based in Mohali, under the Startup India initiative.

Alignment with National Priorities

- By positioning women scientists at the forefront of enterprise-level biotechnology innovation, it embodies the country's commitment to **women-led development, reflecting the G20 vision of advancing women's leadership in science and technology.**
- The enterprise, Matriarchs Bioworks, is registered under the **Startup India initiative**, thereby supporting the national agenda of driving innovation-driven entrepreneurship.
- In line with **India's Bioeconomy Vision,** the establishment of an indigenous biotech platform not only supports the National Biotechnology Development Strategy but also positions the enterprise to contribute meaningfully to the nation's ambition of achieving a **$300 billion bioeconomy by 2030.**

LEADERSHIP COMPETENCIES DISPLAYED

Relationship Building

Ecosystem Mindset

Leader Agility

Devina Kothari
Director,
Zuan Design Labs LLP

JAYA: Advancing Data-Driven Public Healthcare

Background

Despite concerted efforts by both government agencies and emerging health tech startups, the absence of an integrated data framework severely limits the potential for predictive analytics, effective resource allocation, and timely disease detection. Project JAYA was conceptualised to address these structural shortcomings by introducing a holistic, data-driven solution for public health delivery.

Through its three-pronged strategy—a real-time smart assistant for ASHAs (Accredited Social Health Activists), a predictive disease forecasting model, and an interactive monitoring dashboard—the project aims to enhance the responsiveness and efficiency of public health governance. At its core, JAYA endeavours to establish standardised and high-accuracy disease surveillance frameworks that not only inform healthcare delivery but also empower women frontline workers through improved digital literacy and decision-making capabilities.

Innovation

JAYA introduces a suite of integrated tools designed to modernise and streamline public health operations. **The smart assistant tool—designed specifically for ASHAs—facilitates real-time data capture during field visits, enabling high-frequency, high-quality data generation.** This data is fed into a predictive disease forecasting model that refines key indicators to develop disease-specific gold standards for public health analytics. Additionally, an interactive dashboard provides visualised insights for health authorities, fostering data-backed decision-making at policy and implementation levels.

Scalability is embedded in JAYA's architecture. It is designed to transition from pilot phases involving a small group of ASHAs to wider deployment across districts and states. The modular structure allows for AI-driven expansion into areas such as emergency preparedness and national disease surveillance frameworks.

Advancing Women and Girls

The Project emphasises a gender-inclusive digital health transformation. By equipping women ASHAs with intuitive, validated tools, JAYA enhances their ability to provide timely and accurate care, particularly in maternal and child health. A strong UX/UI design process—based on feedback from ASHAs—ensures the interface is aligned with their real-world needs, overcoming prior inefficiencies in existing digital tools that lacked frontline worker input.

Early Successes

- Project JAYA has completed the foundational phase of research and development, involving ecosystem mapping, comparative analysis of existing tools, expert consultations, and structured data mapping.
- UX/UI design aligned with ASHA feedback has been completed and is undergoing prototype testing.
- A quasi-experimental pilot study, involving scaled deployment from 3 to 50 ASHAs, is set for phased rollout through 2025–2026.

Alignment with National Priorities

- Project JAYA directly supports the **Digital Health Mission** and **Ayushman Bharat** by strengthening real-time data ecosystems and enabling evidence-based healthcare delivery.
- By advancing **women-led development**, it places ASHAs at the centre of innovation, bridging gaps in maternal and child health services.
- Its focus on AI integration and predictive surveillance also supports the **National Digital Health Blueprint and the 5T Economy framework**—particularly in terms of technology, time-bound delivery, and talent optimisation.

LEADERSHIP COMPETENCIES DISPLAYED

Ecosystem Mindset

Developing Others

Confidence and Courage

Rajeswari Aghoram
Additional Professor,
Jawaharlal Institute of Postgraduate Medical Education and Research

Developing a Collaborative Care Model for Pregnant Women with Epilepsy

Background

Epilepsy is a complex neurological condition with diverse implications for individuals across the lifespan. However, its management among women—especially during pregnancy—presents unique clinical, psychological, and social challenges. The interaction between epilepsy, anti-seizure medications, and hormonal cycles introduces risks that range from teratogenic effects to reproductive and mental health complications. Current care paradigms are often fragmented, with separate specialists addressing isolated symptoms, and there is limited evidence on integrated care approaches tailored to diverse socio-cultural settings such as India.

Women with epilepsy face multilayered inequities across health, education, and social participation. Compared to the general population, they experience lower rates of education, employment, marriage, and childbearing, pointing to deeply entrenched systemic disparities. Recognising the absence of coordinated, gender-sensitive, and context-appropriate care models, this Project was initiated to understand existing practices and inform the design of collaborative care for pregnant women with epilepsy in India.

Innovation

This Project **introduces a novel collaborative care approach by combining quantitative and qualitative research methods to map the lived experiences, clinical needs, and service gaps faced by pregnant women with epilepsy.** Formative research was conducted through a mixed-methods study targeting all such patients seeking care at the institute. Key variables such as demographic data, epilepsy-related parameters, pregnancy history, treatment compliance, self-management behaviour, anxiety levels, and quality of life indicators were collected.

To capture the full spectrum of patient experience, a participatory research method was adopted. Stakeholder perspectives—including those of patients, caregivers, and healthcare workers—were analysed using actor-factor mapping and thematic coding of interview transcripts. As of July 2025, the data is being synthesised through joint display analysis, offering a robust evidence base to identify key focus areas requiring intervention.

Advancing Women and Girls

The **ultimate innovation lies in developing an integrated, protocolised model of care specifically tailored for pregnant women with epilepsy.** This will involve a literature review to evaluate current global guidelines, followed by contextual adaptation based on study findings. A multidisciplinary protocol will be disseminated to all relevant departments, and efforts will be made to institutionalise a dedicated clinic with administrative backing. Continuous data collection will be embedded throughout the lifecycle of the clinic to ensure iterative improvements and rigorous monitoring of outcomes.

Early Successes

- Preliminary findings from a study involving over 40 pregnant women with epilepsy revealed critical care gaps.
- None of the participants had planned their pregnancies, and more than 50% were non-compliant with anti-seizure medications.
- Approximately one-third experienced seizures during pregnancy and delivery, significantly increasing health risks.
- Anti-seizure medications emerged as a central theme of concern across all stakeholder groups, influencing medication adherence, anxiety, and societal pressures.
- Most women had accessed two–three other care providers before reaching the institute, indicating missed opportunities for early intervention and continuity of care.

Alignment with National Priorities

- The Project's emphasis on a multidisciplinary, protocol-based system supports the goals of the **National Health Policy 2017,** which advocates for integrated and people-centred health services.
- By foregrounding the experiences and needs of women with epilepsy, the project reinforces India's commitment to **women-led development**, ensuring that healthcare systems are inclusive and responsive to gendered health challenges.
- The initiative also complements the **National Digital Health Mission** by laying the groundwork for data-informed, standardised treatment protocols that can be replicated across institutions.

LEADERSHIP COMPETENCIES DISPLAYED

Ecosystem Mindset

Leadership Presence

Resilience

Resmi G

Associate Professor,

Dept. of Design, Manipal School of Architecture and Planning, Manipal Academy of Higher Education

Community Development Programme to Create Awareness Among Girls and Women on Menstrual Hygiene Practices and Well-being

Background

The improper disposal of single-use, non-biodegradable sanitary napkins poses significant environmental and public health concerns. These products can take between 500 to 800 years to decompose, and their components—particularly Super Absorbent Polymers (SAPs)—fragment into microplastics, which pollute the soil, water, and air, eventually entering the food chain and harming human health and ecosystems. Despite these risks, awareness of proper menstrual waste management remains limited, especially among young girls and women in communities.

Innovation

This Project seeks to bridge this critical awareness gap through a creative and community-centred approach. It focuses on sensitising women and adolescent girls to the adverse health and environmental effects of non-biodegradable menstrual products and improper disposal methods. The intervention includes the development of educational posters, puppet-making kits with story-driven templates, and a short, animated video featuring a relatable character. These tools are designed to be engaging, accessible, and scalable, enabling school children to participate actively in awareness campaigns as part of their social outreach programs. The Project emphasises community ownership of the issue and uses design as a tool for behavioural change.

Advancing Women and Girls

The Project aims to raise awareness about the environmental and health risks of improper menstrual waste disposal. Through innovative, community-driven tools—such as educational posters, puppet-making kits, and animated videos—

the initiative empowers women and girls to adopt safer hygiene practices while promoting sustainable waste management. By engaging schools and local communities, the Project fosters long-term behavioural change and environmental stewardship.

Early Successes

- **The Project has successfully created culturally relevant educational materials aimed at transforming menstrual hygiene practices.** By integrating puppet kits and visual storytelling into school programs, the initiative encourages youth engagement and helps normalize conversations around menstruation and hygiene.
- **The upcoming video content** will serve as a reusable digital asset for campaigns across schools and communities.

Alignment with National Priorities

- This initiative directly contributes to the **Swachh Bharat Abhiyan** by promoting sanitary waste management and environmental hygiene.
- It also supports **Beti Bachao Beti Padhao** by empowering adolescent girls with health literacy.
- Through its sustainable design and community involvement, it aligns with India's commitments to the **Sustainable Development Goals**—particularly Goal 3 (Good Health and Well-being), Goal 5 (Gender Equality), and Goal 6 (Clean Water and Sanitation).
- The use of design-led, low-cost educational interventions also reflects the principles of the **5T Economy,** emphasising community-led transformation and technology-driven awareness strategies.

LEADERSHIP COMPETENCIES DISPLAYED

Ecosystem Mindset

Leader Identity

Developing Others

Rita Narayan
Professor,
Tamil Nadu Veterinary and Animal Sciences University

Skill Development in Dairy Product Preparation as a Pre-release Rehabilitation Programme for Women in Reformatories

Background

The dairy sector in Tamil Nadu is flourishing, with growing demand for value-added products such as curd, paneer, ghee, lassi, and yoghurt. These products require minimal infrastructure, making them ideal for small-scale enterprises. Despite this, women in reformatories often lack the training and opportunities to pursue livelihood options post-release. This gap in rehabilitation services hampers their reintegration into society and sustains cycles of marginalisation and economic dependency.

Innovation

This Project integrates skill development in dairy product manufacturing with the pre-release rehabilitation process for women inmates. Women with backgrounds in agriculture or animal husbandry are selected by jail authorities to participate in a structured three-day training programme. The initiative includes hands-oto produce practices, demonstration of product preparation, and supply of essential equipment through programme funding. The trainees receive instructional handouts and are encouraged to use the acquired skills to operate incubation units that can later evolve into self-sustaining micro-enterprises.

Advancing Women and Girls

The Project is providing incarcerated women with vocational training in dairy product manufacturing, equipping them with livelihood skills for economic independence post-release. The initiative offers a rehabilitation model by offering hands-on training, startup resources, and entrepreneurial pathways, enabling marginalised women to emerge as self-reliant contributors to Tamil Nadu's dairy sector.

Early Successes

- The Project has **laid the foundation for a viable, scalable rehabilitation model. A complete set of dairy production equipment has been procured, and inmates have undergone hands-on training in safe food processing practices.**
- Plans are underway to evaluate the programme's impact and ensure continuity through inmate-led incubation centres.
- The prison's internal outlets offer a potential platform for branding and selling these products, fostering a sense of ownership and economic empowerment among the participants.

Alignment with National Priorities

- This initiative supports the **Skill India Mission** by providing vocational training tailored to women's post-incarceration employment needs.
- It reflects the goals of **women-led development**, ensuring economic participation and social dignity for a vulnerable demographic.
- The Project also contributes to Startup India through its incubation-oriented model and with the **National Policy for Skill Development and Entrepreneurship,** fostering inclusive growth, social equity, and sustainable economic reintegration.

LEADERSHIP COMPETENCIES DISPLAYED

Developing Others

Leader Agility

Confidence and Courage

SK Mathangi

Assistant Professor College of Food and Dairy Technology, Tamil Nadu Veterinary and Animal Sciences University

Moringa Millet Milk (MMM) Noodles: Breakfast Supplementation for Hostel Girl Students to Build Resilience Against Suboptimal Iron Deficiency Anaemia

Background

Iron deficiency anaemia impacts the health of college girls staying in hostels, who often experience recurrent deficiencies that lead to other illnesses and hidden hunger-related problems. This makes young hostellers a particularly vulnerable group. To bring about change, they must be made aware of nutritional iron requirements throughout the life cycle and their intergenerational impact. Awareness and preventive measures are essential to improve health outcomes and reduce the long-term burden of iron deficiency among this population.

Innovation

To balance taste with nutrition, the Project developed millet-based, milk-enriched moringa noodles (MMM noodles) as a wholesome food product. The formulation combines the iron-rich content of millets, the high calcium and iron of moringa, and the protein of milk—creating a nutrient-dense option that appeals to young palates. MMM Noodles underwent comprehensive laboratory testing to validate its nutritional content. The analysis confirmed that the product delivers a robust nutritional profile.

- Each 100-gram serving contains **9.36 micrograms of iron,** supporting energy metabolism.
- The inclusion of **skim and whole milk powder** raised the **protein content to 23 grams per 100 grams.**
- **Millets make up 40%** of the product composition, significantly higher than the industry average of approximately 10%, enhancing its overall nutritional value.

Advancing Women and Girls

Continuous intake of iron-rich foods and increased health awareness will positively impact the health of young girls and women. Expected outcomes include improved haemoglobin levels, reduced absenteeism during menstruation, decreased fatigue, and enhanced academic and athletic performance.

Early Successes

1. The Leadership Project achieved a milestone in the standardisation and development of Moringa Millet Milk (MMM) noodles, including analysis of nutritional composition, microbial safety, and physicochemical properties.
2. Sensory tests have been conducted to assess the taste and acceptability of the product.
3. Nutritional awareness was promoted through a play-way approach, including a regional-language snake and ladder game.
4. A "zero-junk" programme engaged school and college students on healthy eating and iron-rich foods, supported by interactive sessions reinforcing the importance of regular iron intake.

Alignment with National Priorities

- This initiative supports **POSHAN Abhiyaan, Anaemia Mukt Bharat, and the National Adolescent Health Programme (RKSK)** through its focus on adolescent nutrition and anaemia prevention.
- Contributes to **women-led development** by addressing young women's health needs.
- The use of indigenous ingredients and potential for scale also aligns with **Atmanirbhar Bharat and India's Bioeconomy**, showcasing a sustainable, community-rooted approach to innovation in public health.

LEADERSHIP COMPETENCIES DISPLAYED

Leader Identity

Ecosystem Mindset

Developing Others

Catalysing Institutional Change

Jayashree Mahesh
Associate Professor,
Birla Institute of Technology & Science (BITS), Pilani

Integrating Leadership and Service Learning for Women Faculty in STEM Education

Background

This Project addresses the underrepresentation of women faculty in leadership positions in Indian higher education, particularly STEM disciplines. Challenges arise from insufficient integration of service-learning pedagogy—an educational approach that combines learning with community service—within academic curricula and barriers women educators face, including inadequate institutional support and resources, which limit their ability to engage in community-focused scholarship and leadership development. These issues highlight the urgency of implementing targeted programmes to empower women, enhance their leadership capabilities, and effectively address critical societal issues. In alignment with the National Education Policy (NEP) 2020, the Project's aims to establish a collaborative ecosystem that engages faculty, students, community members, and institutions in addressing societal challenges through service-learning.

Innovation

The Project launched the pilot programme "W.E. R.E.A.C.H." (Women in Education - Raising Engagement and Awareness in the Community through Hands-on Learning) in collaboration with the Pilani AtmaNirbhar Centre (PARC) to build leadership skills among women faculty while fostering partnerships with local communities. Selected faculty underwent training in service-learning principles, which requires collaboration with community organisations, service activities tied to course objectives, and structured student reflection.

A 12-hour outreach programme was developed, comprising eight sessions on goal setting, financial literacy, safe technology use, and women's health. This initiative provided essential life skills, mentorship, and career counselling, delivered by women faculty and higher education students, addressing societal barriers and helping to close the gender gap in these critical areas. Integrating service-learning

as a pedagogical approach within the academic curriculum enhances practical experiences for participants. The Project also aims to establish a centralised Service-Learning Center to support faculty, strengthen student-community partnerships, and enable research.

Advancing Women and Girls

Service-learning focuses on equipping women faculty and higher education students with essential leadership skills, enabling them to address societal challenges directly. The initiative seeks to create a positive societal impact through community engagement, enhancing transformational leadership among women in STEM, and driving community-driven change.

Early Successes

- The initiative successfully integrated service-learning pedagogy, trained faculty in service-learning principles, and partnered with **PARC** to address local challenges.
- The programme engaged 54 female students from local government schools through workshops and activities, resulting in gains in menstrual health, nutrition, and online safety awareness (menstrual cycle knowledge rose from 60% to nearly 100%, and safe internet practices from 57% to over 85%).

Alignment with National Priorities

- The Project reflects the goals of **Beti Bachao, Beti Padhao** by empowering adolescent girls through education on life skills, health, and digital safety.
- Through the training and leadership of women faculty, it supports **Mission Shakti (Samarthya)**, which emphasises capacity-building and gender-responsive leadership.
- The integration of service-learning pedagogy and community engagement echoes the **National Education Policy (NEP) 2020** focus on experiential learning and institutional innovation.
- The emphasis on safe technology use for girls aligns with the objectives of **Digital India**, promoting digital literacy and protection among vulnerable youth.

LEADERSHIP COMPETENCIES DISPLAYED

Leadership Presence

Confidence and Courage

Ecosystem Mindset

Shilpi Sharma
Professor,
Indian Institute of Technology (IIT), Delhi

Creating Awareness among Rural Communities about Sustainable Approaches for Healthy Soil

Background

Increasing pressure on food production, along with rapidly declining soil health pose a significant threat to food security in India, necessitating the adoption of sustainable agricultural approaches. While the effectiveness of novel microbiome-based tools has been established in enhancing plant growth and productivity without adversely impacting soil health, large scale applications remain unadopted. This Leadership Projects attempts to understand awareness, receptivity, and bottlenecks to the adoption of these agricultural management practices among male and female farmers in the country.

Innovation

The Project involved leveraging a strong network to be able to maximise reach to farmers, especially to rural women engaging heavily in agrarian responsibilities. Two international workshops were organised at the Indian Institute of Technology (IIT) Delhi to identify gaps in communicating scientific breakthroughs to the rural community, especially the woman engaged in the agricultural workforce. Based on the feedback from these workshops, a survey questionnaire was prepared to capture farmer perceptions and the need for novel, sustainable, agricultural approaches. The survey was administered across 19 states in the respective local languages over a period of four months.

Survey responses will be used to develop a report assessing farmers' awareness and acceptance of sustainable agriculture approaches, related to enhancing soil health. The report will also include a comparative analysis of acceptance and awareness levels between male and female farmers. Following the conclusion of the surveys, farmers will be strategically engaged to spread awareness of different strategies for sustainable agriculture.

Advancing Women and Girls

This Project intends to leverage the women workforce as "Agents of Change" and recognises the United Nations perspective that "women and girls are also early adopters of new agricultural techniques, first responders when disaster strikes, and important decision-makers at home about energy and waste." Climate action cannot be successful or sustainable if it does not involve women.

Early Successes

- Of the 258 farmers interviewed so far, 23% have been women.
- Of the farmers surveyed, 150 reported practising conventional farming approaches, 49 practised a combination of conventional and sustainable approaches, and 29 reported relying on organic farming and a conservation approach.
- 19 states have been covered so far by the survey, with a plan to expand to all states in the country, collecting responses from at least 500 farmers.
- Alignment with Government Priorities
- This Project supports the Ministry of Agriculture and Farmers Welfare initiatives to encourage women farmers to take the lead in agriculture, focusing on skills training and improving agricultural productivity.
- The **Mahila Kisan Sashaktikaran Pariyojana (MKSP)** particularly focuses on providing women farmers with a better understanding of sustainable agriculture.

LEADERSHIP COMPETENCIES DISPLAYED

Ecosystem Mindset

Leader Agility

Relationship Building

Shreya Malik

Professor,

Head, Biotech/Medtech/Agritech Startups, Startup Incubation and Innovation Centre, Indian Institute of Technology (IIT), Kanpur

Beyond Academia: Empowering Researchers to Pursue Entrepreneurship as Alternate Career Pathway in STEM

Background

Doctoral and postdoctoral researchers in India are the backbone of scientific innovation, executing complex experiments, mentoring junior researchers, contributing to high-impact publications, and managing laboratories. Despite their pivotal role in ensuring research continuity and project success, they face unclear career advancement pathways and limited resources. Early career women researchers in particular encounter intense pressures after completing their PhD or postdoctoral fellowships. Their professional demands compete directly with social obligations including family commitments, pregnancy, childbirth, and childcare responsibilities during their prime career years. This "leaky pipeline" of dynamic and meritorious postdoctoral researchers reflects organisational cultures that inadequately support career advancement, insufficient faculty positions in universities and institutions, and persistent societal gender inequalities because of which women bear disproportionate household responsibilities. Creating awareness among postdoctoral researchers about broader career opportunities such as roles in industry, entrepreneurship, policymaking and consulting is essential to tap into their potential, reduce academic bottlenecks, and encourage researchers to explore roles in which they can apply their expertise in meaningful and impactful ways.

Innovation

This Leadership Project leverages existing programmes to create awareness about entrepreneurship as a promising career option for researchers. The awareness programmes will include presentations by role models who have made the transition from research to entrepreneurship. In addition, various avenues for pursuing entrepreneurship, that is, fundraising, product development, technology transfer, making business connections, inculcating finance and sales skills, among

other will be discussed. This Project will also explore the creation of doctoral and postdoctoral career development cells within institutions and policy initiatives that can be undertaken by funding agencies.

Advancing Women and Girls

By proposing alternative STEM careers well-suited for postdoctoral researchers, this Leadership Project intends to lower the dual burden of work on women researchers and reduce the intensity of professional demands in their lives.

Alignment to Government Priorities

- By encouraging women entrepreneurs in STEM, this Project resonates with the aims of **Startup India**.
- It also aligns with the **NITI Aayog's Women Entrepreneurship Platform (WEP) initiative** to contribute to advancing women's entrepreneurship in India.

LEADERSHIP COMPETENCIES DISPLAYED

Leader Identity

Relationship Building

Developing Others

Centering Women and Girls in STEM

Ira Naim
Assistant Professor,
MJP Rohilkhand University, Bareilly

HERlytics: Bridging Gender Gaps in Data Science

Background

As data continues to grow in importance, the role of data science within STEM will only become more vital, making it essential for future generations of STEM professionals. As Women in Data Science (WiDS) observes, "Data science and its related areas are critically reshaping our world, yet women are still significantly underrepresented: they represent less than 20% of students and less than 10% of decision makers." The aim of this Project is to neutralise different barriers and raise awareness related to STEM particularly about data science at the school-level for girl students.

Innovation

HERlytics: Bridging Gender Gaps in Data Science is an initiative aimed at addressing and mitigating the gender disparities present within the data science industry. Through targeted interventions, awareness campaigns, and community-building activities, HERlytics seeks to create a more inclusive and diverse environment for women and girls to pursue their careers in data science.

Advancing Women and Girls

This Project aims to identify interest in data science among girls, with a vision to empower them to work in the field of data science. By providing young women with the knowledge, skills, and confidence to pursue careers in data science and STEM fields, this Project hopes to engender equal representation of women in data science and STEM fields globally, starting from the classroom.

Early Successes

- Awareness workshops were conducted in 10 schools with over 600 student participants from Grades 9 to 12.

- Pre- and post-surveys were conducted to evaluate student awareness, interest, and learning outcomes in data science. The results suggest significant awareness about data science in the post-survey when compared to pre-survey responses.

Alignment with Government Priorities

- This Project aligns with the Government of India priorities towards advancing women's participation in science and technology.
- It supports the **Vigyan Jyoti Scheme** to address the underrepresentation of women in different fields of STEM in the country.
- It also supports the **Women in Science and Engineering-KIRAN (WISE-KIRAN) scheme** to enhance women's participation in STEM.

LEADERSHIP COMPETENCIES DISPLAYED

Developing Others

Relationship Building

Leader Identity

Keithellakpam Sanatombi
Professor,
Manipur University

Popularisation of the Role of Biotechnology in Providing Solutions for Sustainable Development Among Girls and Women

Background

Biotechnology is a rapidly emerging multidisciplinary area of activity that has the potential to impact all domains of human welfare. Adopting different biotechnological applications will provide sustainable solutions for addressing the United Nation's Sustainable Development Goals (SDGs). To empower women and girls and promote STEM engagements among them, this Project aims to popularise the role of biotechnology in achieving the SDG targets to inspire the next generation of women and girls in schools and colleges to pursue careers in these fields

Innovation

To inspire women and girls to pursue careers in STEM, a series of popular lectures were delivered in schools and colleges in Manipal, especially in girls-only institutions, to spread awareness about the usefulness of adopting biotechnology for sustainable development.

Advancing Women and Girls

By investing in the biotechnology popularisation programmes for girls in schools and colleges, this Project aims to challenge social norms and empower female students to be the next generation of women leaders in science and increase the number of girls pursuing STEM careers, particularly in biotechnology.

Early Successes

- As of February 2025, popularisation talks were delivered in nine educational institutions, including three colleges and six schools.

- In addition to the importance of biotechnology, the talks also discussed career opportunities and stories of successful women leaders in the field.
- Feedback was collected from participants to assess the impact and outcome of the Project.

Alignment with Government Priorities

- This Project supports the **Women in Science and Engineering-KIRAN (WISE-KIRAN) scheme** to enhance women's participation in STEM.
- It also supports the **Vigyan Jyoti scheme** to address the underrepresentation of women in different fields of STEM in the country.

LEADERSHIP COMPETENCIES DISPLAYED

Leadership Presence

Developing Others

Relationship Building

Pranaya Joshi
Research Lead,
Scigram Technologies Foundation

Bridging the STEM Divides for Tribal Girls in Maharashtra

Background

In India's remote tribal regions, STEM education remains an inaccessible privilege rather than a fundamental right. Socioeconomic barriers, deeply entrenched gender norms, and lack of resources systematically exclude tribal girls from scientific learning, reinforcing cycles of underrepresentation in STEM fields. This exclusion is a missed opportunity for entire communities to participate in and benefit from technological and scientific advancements.

Innovation

This Leadership Project developed the STEMBridge programme, a part of the Metaknowledger initiative, to directly address this inequity by transforming *ashram* schools into community-driven STEM hubs with a focus on enrolling tribal girls. This Project aims to create a scalable model that transforms STEM education into an inclusive, gender-equitable ecosystem, ensuring tribal girls become active participants in shaping the future—not just passive recipients of technology. STEMBridge redefines traditiona and rigid STEM education practices by creating an adaptive, technology-driven ecosystem that seamlessly integrates computational modelling, hands-on experimentation, and indigenous knowledge systems. The Project aims to help students become independent in machine building and computation, with the goal of enabling them to tackle farming and cultivation issues in their communities.

The Project

- Uses sensor-based monitoring, AI-driven climate models, and biotechnology to solve real-world problems—bridging scientific inquiry with traditional ecological knowledge, and trains students to test real-world solutions using data-driven experimentation, 3D fabrication, and automation.

- Leverages AI tutors in local languages break literacy barriers, ensuring every student can engage in STEM without language constraints.
- Engages directly with tribal leaders, educators, and families through focus groups and interviews to align STEM learning with local challenges

Advancing Women and Girls

This Project has been designed as a systemic intervention to redefine how tribal girls engage with science and technology. With a goal to create a self-sustaining, community-driven STEM ecosystem, the Project intends to support girls in transitioning from learners to creators, from passive recipients to active contributors to knowledge.

Early Successes

- 450+ tribal students (majority girls) trained in hands-on, computational STEM learning.
- Increased engagement in STEM subjects through localised, problem-driven learning (e.g., climate monitoring, precision farming, GIS mapping).
- Visible shift in aspirations—students see STEM as a tool for solving real-world challenges, not just a subject in textbooks.
- Women-led mentorship programs established with industry & academic professionals.
- Local educators trained to deliver AI-assisted, multilingual STEM learning.

Alignment with Government Priorities:

- Supports the **Vigyan Jyoti Scheme** and **Women in Science and Engineering-KIRAN (WISE-KIRAN) scheme** to address the underrepresentation of women in different fields of STEM in the country.
- Aligned with the **Government of India's New Education Policy (NEP) 2020,** which emphasises the integration of AI curriculum at all educational levels and aims to equip students with skills like digital literacy, coding and computational thinking.

LEADERSHIP COMPETENCIES DISPLAYED

Leader Identity

Ecosystem Mindset

Leader Agility

Vasudharani Devanathan
Associate Professor,
IISER Tirupati

Promoting Women and Girls in STEM

Background

Rural girls face multiple barriers preventing them from pursuing STEM careers despite showing strong interest and performance in science subjects during school. These girls often receive discriminatory messages that STEM subjects are "hard" and "not for girls," creating an environment that discourages their continued engagement. The support system and opportunities needed to explore STEM careers are unavailable, thus leaving them without necessary guidance.

Innovation

The Unnati Club of IISER Tirupati, set up in 2015 by Vasundhara Devanathan, has contributed towards providing educational support to students in the district. As a part of this Leadership Project, the Unnati Club has been conducting inspirational talks, storytelling sessions (stories of scientists), and model building sessions to encourage STEM education and careers for the students.

Advancing Women and Girls

Through the hands-on model building sessions and educational support, this Project addresses gender-biased cultural messaging towards STEM subjects and attempts to help build confidence in girls who may have internalised societal messages about their limitations in STEM fields.

Early Successes

- 800 school students across 15 schools engaged in visiting STEM activities on National Science Day,
- The students were addressed by the Collector of Tirupati, who highlighted the importance of STEM as a career.

Alignment with Government Priorities

- This Project is in alignment with the **Vigyan Jyoti scheme**, which offers exposure for girl students from the rural background to help plan their journey from school to a job of their choice in the field of science.
- It also supports the **Women in Science and Engineering-KIRAN (WISE-KIRAN) scheme** to enhance women's participation in STEM.

LEADERSHIP COMPETENCIES DISPLAYED

Developing Others

Relationship Building

Leadership Presence

Vijayalaxmi Biradar

Director IQAC,

Kalinga University; Secretary/Chairperson IEEE Women in Engineering AG 2025, IEEE Madhya Pradesh

Symposium on Education and Outreach

Background

India's rapidly evolving technological landscape demands that the next generation of workers be equipped with skills in emerging fields like robotics and the Internet of Things (IoT). With over 220 million children between 6-16 years, India's young population represents immense potential for STEM advancement. However, a significant divide exists between urban and rural educational opportunities. Rural India continues to lag in accessing modern STEM learning opportunities, creating a gap that could impact the country's technological progress.

Innovation

This Project introduces robotics and IoT education to rural school children through a comprehensive approach that includes surveys, workshops, focus group discussions, and direct outreach to community leaders. This hardware-software integration fosters creativity, analytical skills, and decision-making abilities while enhancing problem-solving and higher-order thinking capabilities. The initiative sparks early interest in STEM fields and builds essential skills including teamwork, communication, and community engagement through hands-on learning experiences.

Advancing Women and Girls

The Project addresses the underrepresentation of girls in STEM fields by providing equal access to robotics and IoT education in rural areas, where traditional gender barriers may be more pronounced, ensuring that girls can develop transformative skillsets for future careers in science and technology.

Early Successes

- The Project has successfully organised workshops for rural school students, impacting 200 students to date.

Alignment with Government Priorities

- This Project is in alignment with the **Vigyan Jyoti scheme**, which aims to establish gender parity in STEM fields that are underrepresented by women.
- It also contributes to the **Women in Science and Engineering-KIRAN (WISE-KIRAN) scheme** to enhance women's participation in STEM.

LEADERSHIP COMPETENCIES DISPLAYED

Developing Others

Relationship Building

Resilience

STEM Innovation and Policy

Banasri Roy
Professor,
Birla Institute of Technology and Science (BITS), Pilani

Comparisons of Thermochemical and Biological Routes for the Conversion of Agricultural Wastes to Value-Added Chemicals

Background

Depletion of fossil fuel reservoirs and pollution from their burning are serious global issues. India ranks second in energy consumption at 4816 KWh. In 2013, India's energy requirement was 185,000 MW, projected to increase to 400,000 MW by 2030. However, India holds only 0.9% of global oil reserves, compared to China (5%), the USA (15%), and the Middle East (59%). Additionally, India produces over 620 million tonnes of agricultural residue annually, much of which is burned, contributing to air pollution, and releasing harmful pollutants like carbon dioxide, carbon monoxide, methane, sulphur oxides, and nitrogen oxides etc. Therefore, alternative renewable and green energy sources are essential.

Innovation:

This Project compares **thermochemical** and **biological routes** for converting agricultural biomass into high-value chemicals.

1. **Biological Route:** Selected microbes (including novel strains) will be optimised for degrading cellulose, hemicellulose, and lignin—key components of agro-waste. Each substrate will be studied individually and in combination, with the resulting products characterised using advanced analytical techniques such as GC-MS-MS.
2. **Thermochemical Route:** Biomass will undergo pyrolysis in a controlled atmosphere tubular furnace to produce bio-oil and other intermediates. The products will be condensed, purified using solvents (MeOH and acetone), and analysed for composition and yield.

The development of a biological route for producing valuable industrial chemicals could lead to a startup. Additionally, this Project serves as proof-of-concept research (TRL 4) that will attract further funding to scale up to industrial applications (TRL 7-8). By utilising agricultural residue, this project will contribute to reducing pollution, lowering carbon footprints, and promoting sustainability.

Advancing Women and Girls

The Project addresses gender inclusion in STEM by involving more women—through research roles or academic projects—to encourage their pursuit of STEM careers and foster systemic change toward gender equality in leadership.

Early Successes

- The team has produced bio-oil through pyrolysis, with the results moving towards a patent filing.
- Short-term successes include training students, publishing high-impact journal papers, and filing patent applications.

Alignment with National Priorities

- The Project aims to develop a scalable biological route to produce industrially relevant chemicals, potentially leading to a startup. It also aligns with India's sustainability and bioeconomy priorities, including **Atmanirbhar Bharat** and the **5T Economy by 2030.**
- By utilising agro-residues, it promises reduced carbon emissions and long-term environmental benefits. It also fosters innovation in green technologies, aligning with the **Atal Innovation Mission (AIM)'s** goal of promoting entrepreneurship and innovation, especially in the green technology sector.

LEADERSHIP COMPETENCIES DISPLAYED

Ecosystem Mindset

Leader Identity

Leadership Presence

Divya Khanna
Project Scientist,
CSIR Institute of Genomics and Integrative Biology

Unveiling Genomics: Fostering Awareness for a Healthier Tomorrow

Background

India has made progress through initiatives like Genome India, which maps genetic diversity to enable personalised medicine. Genomic advances offer insights into how genes influence health, allowing early risk assessment. However, integrating genomics into clinical practice remains a challenge, especially in low-resource settings. Indian women face growing risk due to delayed diagnoses and limited screening access. While mammography is standard, it has limitations, particularly for dense breast tissue and especially in the low- healthcare access areas.

Innovation

This Project employs an innovative complementary approach that combines tactile breast examinations by Medical Tactile Examiners (MTEs)—visually impaired individuals trained to detect breast abnormalities—with genomic insights to prioritise high-risk individuals for targeted screening. Research shows that MTEs can identify subtle tissue changes with high accuracy, aiding early breast cancer detection. The model is cost-effective, accessible, and ideal for low-resource settings. Additionally, training visually impaired women as MTEs provides them with meaningful employment, fostering social inclusion. By bridging innovation and inclusion, it improves early diagnosis and reduces healthcare disparities, advancing precision medicine. Structured training, certification, and collaborations with hospitals, research institutes, and blind associations will support clinical integration and long-term impact.

Advancing Women and Girls

Training visually impaired women as MTEs promotes social inclusion, economic empowerment, and dignified employment. At the same time, the model enhances access to early breast cancer screening for women in the rural-settings, addressing

both gender and disability-based health inequities. By combining genomics with tactile screening, this approach places women at the centre—as both providers and recipients of care—advancing equity and agency in community health systems.

Early Successes

- A one-day Women's Day (#AccelerateAction) programme brought together scientists, clinicians, and blind school associations for hands-on demos and discussions on genomics in cancer risk and the role of MTEs in breast screening.
- Outreach efforts engaged scientists, researchers, and clinicians in discussions around biomarker-driven risk prediction and the complementary role of MTEs in resource-limited settings, with blind school associations helping identify and train visually impaired MTEs.
- Social media and public awareness campaigns used to expand engagement, particularly through college-based outreach and interdisciplinary collaboration to increase visibility and support for the model.

Alignment with National Priorities

- The Project supports the **National Programme for Prevention & Control of Non-Communicable Diseases (NP-NCD)** by promoting early breast cancer screening.
- Through its use of genomics and digital outreach, it complements **the National Digital Health Mission (NDHM)** and **Ayushman Bharat Digital Mission**, enhancing data-driven and inclusive healthcare.
- The training and empowerment of visually impaired women, align with **Mission Shakti (Samarthya)** and the **Accessible India Campaign (Sugamya Bharat Abhiyan)**, promoting gender and disability inclusion.
- By fostering innovation in healthcare delivery, the model resonates with the aims of Startup India and the **Biotech Ignition Grant (BIRAC).**
- Additionally, it complements the **National Cancer Registry Programme (NCRP)** by enabling earlier detection and better surveillance in low-access areas.

LEADERSHIP COMPETENCIES DISPLAYED

Developing Others

Relationship Building

Leader Agility

Pooja Singh
Assistant Professor,
Symbiosis International University

Sustainable Management of Aquatic Waste Biomass for Improved Environmental Protection, Women's Health, and Societal Upliftment

Background

In India, the absence of organised waste segregation and disposal leads to most sanitary waste being dumped in landfills, dumping grounds, or water bodies. Plastic from sanitary napkins leaches into soil and water, creating serious environmental and health hazards. On the other hand, water hyacinth, an invasive aquatic weed also clogs water bodies and is often skimmed and dumped, releasing carbon as it degrades. There is a pressing need for biodegradable, plant-based sanitary products that are functional, cost-effective, and circular. Using water hyacinth fibres in napkins supports waste valorisation, promotes women's health, and enables eco-friendly solutions—through collaboration across communities, governance, experts, and academia.

Innovation

Through the process of water valorisation, the use of plant-based resources extracted from the water hyacinth weed, biodegradable sanitary products can be developed, developing a circular economy. This circular model will introduce a fully biodegradable sanitary napkin to the market, which will be both sustainable and cost-effective. The adoption of this biodegradable sanitary napkin will significantly reduce the large volumes of sanitary waste that pollutes landfills, water bodies, and open dumping sites. It will also contribute to improved menstrual hygiene and overall health outcomes for women

Advancing Women and Girls

This Project address critical gaps in menstrual health and women's economic empowerment. The development of an absorbent, biodegradable sanitary napkin directly benefits women by improving menstrual hygiene, health and well-being.

A key aspect of the initiative is including women from marginalised communities in developing the sanitary napkin with the potential of establishing their own enterprises.

Early Successes

- Development of the proof of concept of a sanitary product from aquatic waste, Secured $25,000 in funding from the Elsevier Foundation for further product development
- Assembled a multidisciplinary team to design a fully biodegradable sanitary napkin, focusing on developing its individual layers.
- Partnered with Swachhata Pukare Foundation to utilise their expertise in processing water hyacinth fibres and training women's groups.

Alignment with National Priorities

- This Project directly supports India's national priorities in biotechnology by advancing **Waste-to-Wealth Mission (under Swachh Bharat and Department of Biotechnology initiatives).**
- By transforming invasive water hyacinth into biodegradable sanitary napkins, it aligns with the Department of Biotechnology's focus on bioresource valorisation and the Government's sustainability goals under **Mission LiFE**.
- It also addresses menstrual hygiene—part of the **National Health Mission**—and promotes **women-led development** by involving marginalised communities in production and enterprise development, thereby contributing to inclusive, eco-friendly, and health-focused innovation.

LEADERSHIP COMPETENCIES DISPLAYED

Leader Identity

Ecosystem Mindset

Relationship Building

Optimising Pathways to Leadership

Sonal Saxena
Director Professor and Head,
Maulana Azad Medical College, New Delhi

Empowering the Leader in HER: A Leadership Project for Women in Health

Background

After the completion of their post-graduate studies or senior residencies, women working health in India often find themselves in leadership roles such as the sole managers of laboratories, infection control officers, practising physicians, and clinic managers. After only a few years, they find themselves in middle management roles. These women, even if academically and technically skilled, have been exposed to leadership training and are often ill equipped for these roles.

This Project aims to create a training model that enhances leadership skills for women in health. It provides a supportive network and resources, focusing on improving leadership capacity, career advancement, and team collaboration. The model also aims to increase advocacy, mentorship, and organisational resilience, ultimately fostering adaptability and a broader societal impact.

Innovation

A needs assessment was conducted to formulate a training programme to sensitise women in post-graduate and senior resident roles to leadership and management skills. A pool of trainers was identified, and a training workshop was conducted by this pool of facilitators. The training module was developed using inputs from 91 responses received on the needs assessment form.

Advancing Women and Girls

This Project addresses the gap in leadership training for women in health, particularly those in post-graduation or senior residency roles. Despite excelling in their fields, these women are often ill-equipped for leadership positions due to the lack of formal leadership training. The Project aims to enhance their leadership skills, provide a supportive network, and promote career advancement, team

collaboration, and mentorship, fostering a more resilient and adaptable workforce in health settings.

Early Successes

- A hybrid training workshop was conducted on January 5, 2025, attended by almost 70 participants.
- Real case scenarios and solutions specific to microbiology laboratory were discussed with the participants.
- Feedback was collected to monitor and improve the quality of the training.

Alignment with National Priorities

- This Project aligns with the **National Health Mission (NHM)** by focusing on enhancing women's leadership in health, specifically in management and decision-making roles.
- It also contributes to **Skill India Mission** by promoting the skill development of women, empowering them to take on leadership roles in the healthcare sector.
- It also supports **Rastriya Uchchatar Shiksha Abhiyan (RUSA)** by improving access to leadership training and skills development for women, particularly in healthcare and technology sectors.
- The **Mahila Shakti Kendra (MSK) Scheme** is also in alignment as it empowers them through awareness generation, training, and capacity building.

LEADERSHIP COMPETENCIES DISPLAYED

Developing Others

Leadership Presence

Leader Agility

Ira Praharaj
Scientist E,
Indian Council of Medical Research

Motivating and Optimising Career Pathways for Women in STEM using Digital Platforms: Addressing the Leaky STEM Pipeline

Background

Despite the growing representation of Indian women in various STEM fields in entry-level jobs and early career positions, there are significant barriers that impede the progress of early career women in STEM from continuing in these fields and eventually progressing to leadership positions. The lack of visible role models in STEM leadership positions can discourage young women from pursuing careers in these fields. Seeing successful women in leadership roles can inspire and motivate aspiring STEM professionals, but the scarcity of such role models in India can create a sense of disillusionment and limit opportunities for women.

Innovation

Addressing these challenges requires a multifaceted approach targeting systemic and individual barriers. By providing mentorship, networking, and educational resources, women in STEM can be supported. This Project proposed a mixed-methods study to identify barriers and digital tools useful for skill development. Findings will inform a digital intervention package with podcasts, a YouTube channel (interviews, case studies, webinars), and a resource webpage with publications, funding links, and forums for capacity building.

Advancing Women and Girls

This Project addresses gender disparities in STEM by focusing on early career women who face systemic and individual barriers to advancement. It aims to understand their unique challenges through a mixed-methods study and develop a digital intervention tailored to their needs. By offering mentorship, skill-building resources, and visibility to women's experiences, the Project fosters inclusive

leadership pathways and supports women's progression in STEM beyond traditional academic and research roles.

Early Succeses

- A questionnaire-based study was undertaken along with two focus group discussions.
- Findings revealed that lack of mentorship, visible role models, and grant writing skills are major barriers to the career advancement of early career women in STEM.
- Engaged multiple stakeholders, including experts and women STEM leaders, to contribute to planned podcasts and interviews on these key topics.

Alignment with National Priorities

- This Project aligns with **Mission Shakti (Samarthya Component)** by focusing on leadership development and capacity building for women, particularly in STEM and health research sectors.
- It supports the **Skill India Mission** and **Pradhan Mantri Kaushal Vikas Yojana (PMKVY)** by offering targeted skill development, mentorship, and training opportunities for early career women, enhancing their employability and career progression in STEM.
- Through its emphasis on knowledge creation and research capacity building, the project contributes to the goals of **Rashtriya Uchchatar Shiksha Abhiyan (RUSA)** by supporting leadership advancement in higher education and research.
- The project is in synergy with the **Digital India Programme** through its creation of digital content such as webinars, podcasts, and online learning resources aimed at career advancement for women in STEM.

LEADERSHIP COMPETENCIES DISPLAYED

Leader Agility

Developing Others

Relationship Building

Kavita Pandey

Scientist C,
Centre for Nano and Soft Matter Sciences

Women Leading STEM: Transforming Access, Inspiring Change

Background

The primary challenge addressed by the Project is the underrepresentation and limited participation of women in STEM fields, due to societal biases, limited resources, inadequate mentorship, and gender-based disparities. The Project aims to enhance participation by creating inclusive environments and providing targeted resources and mentorship. It emphasises increasing visibility, equitable access to tools and workshops, mentorship networks, and gender-sensitive policies. Special focus is given to marginalised women, ensuring intersectional support through outreach, scholarships, and awareness sessions.

Innovation

The Project adopts a multi-tiered methodology to address barriers faced by women in STEM. It includes:

1) Tailored curriculum development and workshops;
2) Structured mentorship networks connecting early-career women with experienced professionals and
3) Community engagement with leaders, educational institutions, and policymakers to advocate for gender-inclusive practices and equitable resource allocation.

Baseline surveys, focus groups, and interviews will be conducted to identify specific barriers and continuously refine the approach. Future expansion opportunities include scaling the mentorship network internationally and establishing cross-border collaborations. Digital platforms have the potential to increase accessibility and outreach, particularly benefiting rural or underserved regions. The Project aims to partner with government and private sector stakeholders for sustainable funding and policy advocacy.

Advancing Women and Girls

The Project aims to enhance women's participation by creating inclusive environments and providing targeted resources and mentorship. Key objectives include Increasing the visibility and representation of women in STEM; providing equitable access to educational tools, workshops, and resources; facilitating mentorship networks connecting aspiring women scientists and professionals with established leaders; and encouraging institutions and communities to support gender-sensitive policies. The Project places special emphasis on intersectionality by acknowledging and catering to the needs of marginalised women, including those from rural, socioeconomically disadvantaged backgrounds, or minority communities.

Early Successes:

- Tailored training modules and workshops have been developed to equip women with essential STEM skills, knowledge, and leadership training.
- Structured mentorship programmes pairing early-career women scientists and students with experienced professionals have been established.
- Direct outreach initiatives to community leaders, educational institutions, and policymakers advocating for gender-inclusive practices and resources allocation has been conducted.

Alignment with National Priorities

- This Project supports **Mission Shakti (Samarthya Component)** by building mentorship structures and leadership pathways for women.
- Through tailored training modules, it contributes to the **Skill India Mission** by enhancing job-relevant skills in STEM.
- Under the Department of Science and Technology (DST), it advances the objectives of
    * **KIRAN (Knowledge Involvement in Research Advancement through Nurturing)** by supporting early-career women with mentorship and career development;
    * **GATI Gender Advancement for Transforming Institutions)** by advocating gender-inclusive institutional policies and resource allocation; and
    * **SAGA (Science and Gender Advancement)** through its use of surveys and qualitative research to inform evidence-based strategies.

LEADERSHIP COMPETENCIES DISPLAYED

Developing Others

Relationship Building

Ecosystem Mindset