United Nations Climate Change Global Innovation Hub

Fifth Systemic Innovation Workshop

Workshop Report

Date: 20th and 21st May 2024

Venue World Trade Center, Bangalore, India

United Nations Climate Change
Global Innovation Hub

1 Executive Summary

The UN Climate Change Global Innovation Hub (UGIH) successfully conducted its fifth systemic innovation workshop in collaboration with BuzzOnEarth and Gaia The Earth Foundation, at the World Trade Center in Bangalore, India, on May 20th and 21st, 2024. The objectives of the workshop were fourfold:

- To provide cities a physical space in the form of a workshop, where they can, with their solution providers, backcast and translate into directional goals, then challenges their long-term vision on how their citizens will satisfy their core human needs while aligning with climate and sustainability goals. These long-term visions of cities are referred to as the Future Outlook of Cities.
- To discuss possible challenges that the solution provider participating in the workshop may face in reinventing their organization based on their current assets and their current and/or to be built distinctive competence, skills, and expertise, with a view to being relevant to the Future Outlook of Cities.
- To explore whether, for some of these challenges for cities and their solution providers, a cluster of climate and sustainability solutions is available for upscaled deployment.
- To identify the priority missing solutions that need to be developed or the existing solutions for which we need to accelerate and upscale the deployment and formulate the related critical Innovation Projects

The workshop began with Massamba Thioye (the Project Executive of UGIH) introducing UGIH and setting the stage for the systemic innovation workshop (SIW), followed by presentations from Gayathri Chauhan (Founder and CEO, BuzzOnEarth) and Babu Padmanabhan (Founder & MD, STEER World). Massamba highlighted UGIH's mission to address climate and sustainability goals by finding transformative solutions for the satisfaction of core human needs and introduced the UGIH City Challenge, a $1 billion prize to inspire cities to showcase impactful climate and sustainability actions through media content.

Ms. Gayathri Chauhan emphasized the need for fostering an innovation culture, highlighting BuzzOnEarth's priorities of innovation, regeneration, and youth, as well as their Accelerator for Climate Entrepreneurship program. Mr. Babu Padmanabha, stressed the urgency of tackling deforestation, soil degradation, and microplastic pollution, advocating for resilience through innovation in manufacturing and materials science.

City representatives presented their challenges and future visions, to which solution providers responded by showcasing examples of innovative solutions. These discussions revealed many existing innovations, such as recycling plastic for use as wood substitutes in furniture, leveraging popular culture to drive change, and creating highly affordable, wholesome, and balanced nutritious food. Subsequent breakout sessions and plenaries focused on identifying and prioritizing challenges, leading to the ideation of innovation projects. Participants brainstormed in groups, developing projects that covered multiple core human needs, including shelter, nutrition, and health. Project owners and partners were identified, setting the stage for further project development and ongoing engagement among workshop participants to achieve the envisioned climate goals.

2 Cities' Presentations - Understanding Cities Needs

Hyderabad, India

Hyderabad city has a strategic importance in the state as it hosts 40% of the state's population and 75% of its non-agricultural economy. A detailed study is planned to assess current carbon emissions and identify strategies for achieving net zero, including policy changes and innovative technologies. Hyderabad aims to adopt progressive emission targets, similar to Europe, and leverage local legislation for impactful interventions. Collaboration with the private sector and community, especially Resident Welfare Associations, is crucial. Initiatives like T-Hub support climate tech startups, and the Green Skills Academy fosters necessary talent for sustainability efforts.

Sharjah, United Arab Emirates

Sharjah aims to be a sustainable city, emphasizing net-zero goals, wastewater reuse, waste management, and food security. The UAE is integrating sustainability into urban planning to design future settlements based on ESG principles. Sharjah is developing customized solutions to enhance sustainability and improve human life. Thirty years ago, UAE's efforts focused on removing potent gases from the atmosphere, but the recent shift towards new technologies brings a risk of introducing new greenhouse gases. Innovative solutions must reduce carbon emissions without creating other potent gas emissions.

Bangalore, India

Bangalore faces severe water management challenges, fluctuating between water stress and flooding. The city's elevation and lack of nearby perennial water sources, combined with rapid population growth, exacerbate the crisis. Currently, Bangalore's water supply falls short by 600 MLD, primarily met through borewells, with significant groundwater depletion. Infrastructure gaps and pollution further strain resources. By 2051, water demand will double, necessitating innovative solutions like rainwater harvesting, AI leak detection, and so on. The goal is to achieve an energy surplus in water supply and sewage systems by 2026.

Himalayan region, India

The Indian Himalayan region, covering multiple states, faces unique challenges due to its fragile ecosystems. Rivers from these areas significantly impact densely populated states in the northern region of India. Traditional crops are no longer viable in the region due to climate change, and drying springs threaten water availability. Human-wildlife conflicts, forest fires, and isolated issues like freezing water pipes add complexity. Ongoing efforts, such as deploying sensors in 100 smart cities under the Smart Cities Mission to monitor flooding, heat, and pollution, are innovative approaches to address these challenges by providing valuable data and insights.

Thiruvananthapuram, India

The vision is to create an amiable living environment through scientific planning, leveraging its rich culture, heritage, and technology. Challenges include low population growth, out-migration, and heavy reliance on the tertiary sector. Limited land, costly plots, and non-development zones like lakes and forests are the urban development constraints. Efforts focus on extending economic and social activities beyond a narrow time frame, enhancing community spaces like Manaveeyam Veedhi, improving public transportation, and promoting flexible work hours. Transit-oriented development policies aim to stimulate economic growth and enhance livability.

Kochi, India

The coastal city faces flash floods and sea-level rise due to climate change, compounded by nearly six months of rainfall and heat islands. Loss of green space exacerbates issues, as the city's nucleated settlement pattern undergoes developmental pressure. Limited financial support hampers sustainable development efforts, despite initiatives like canal restoration, electric mobility projects, and sustainable neighborhood development. Scaling up these initiatives requires technical support to address the city's pressing environmental challenges effectively.

3 Summary of the Breakout Groups Discussions

The first breakout session focused on identifying and prioritizing challenges for satisfaction as inspired by the future envisioned by the participating cities. Within their groups, participants engaged in discussions concerning various challenges spanning infrastructure, policy, finance, business models, technology, behavioral change, and other pertinent areas relevant to their work. Following the breakout session, a plenary session was held where participants shared their discussion points, and others offered reflections on the challenges. Discussions primarily revolved around addressing core needs such as shelter, nutrition, health, and mobility, with some challenges cutting across multiple sectors. Below are the major highlights from the discussion.

3.1 Shelter

A significant challenge highlighted by participants in the shelter sector was the hesitation to use recycled construction materials due to safety concerns. This reluctance is compounded by the lack of standards for recycled and innovative materials in the government's schedule of rates, which further hinders their adoption. Participants also identified the climate-inappropriate architecture prevalent in the country as another key challenge. The adoption of Western architectural styles, such as glass facades, is unsuitable for India's climate, negatively impacting the urban microclimate and increasing resource consumption. Additionally, the quality of urban dwellings plays a crucial role in affecting the health of residents.

Another important challenge highlighted was that only a small percentage of buildings in India are certified as green, emphasizing the need to focus on new and existing structures to promote sustainability. Large-scale infrastructure projects will be necessary to meet the projected housing demand of 96 million by 2030. These projects will require significant resources and the implementation of advanced technologies, which will take time to realize. The absence of multifunctional recreational spaces in cities was also highlighted as a challenge.

3.2 Nutrition

Societal focus on immediate food security overshadowing the importance of sustainable agricultural practices was highlighted as a behavior-related challenge by the participants. There is resistance to returning to traditional farming methods, especially among those with agricultural backgrounds. Additionally, there is a lack of responsibility and awareness about existing traditional methods.

Another challenge raised was on migrant populations in cities and their difficulty in accessing nutritious food provided through government schemes as the distribution systems are tied to their permanent residence locations. There is a lack of cohesive policy frameworks supporting sustainable farming practices. Current business models do not adequately incorporate technological solutions in agriculture, such as blockchain. The potential value these technologies can add is recognized, but how they contribute from a business model perspective is unclear. There is a need for practices that can withstand climate challenges, especially for sub-urban agriculture as the food for cities is produced there.

Agriculture glut was noted as another challenge and innovations to prevent that and to reduce transport losses were mentioned as a necessity. Technological advancements are needed for sustainable agricultural practices. Technologies for soil testing and low-cost scalable waste management are also lacking.

3.3 Waste and Water Management

Participants highlighted the importance of changing mindsets to reduce waste, abandoning fast fashion, and adopting durable materials. Additionally, it was emphasized that the perception of water as being free or cheap must be changed, particularly in the face of increasing water stress. Participants highlighted the need to prevent non-sustainable materials from entering cities by greening the entire supply chain as a potential solution. Despite the existence of systems, it was noted that waste segregation and management remain inadequate, resulting in the overuse of landfills. Waste management's labor-intensive and cost-intensive nature was also raised as a financial challenge.

3.4 Access including mobility

Participants highlighted that there is a significant lack of infrastructure that supports the widespread adoption of EVs. Moreover, participants noted the difficulty in obtaining loans for purchasing EVs, which serves as a barrier to entry for many potential consumers. Other challenges related to EVs included sourcing energy for recharging vehicles, recycling lithium batteries, and ensuring a sustainable supply of resources for battery production.

3.5 Cross-cutting challenges

One critical aspect highlighted was the importance of citizen involvement in innovative initiatives. It was emphasized that regulations alone are insufficient; raising awareness and incentivizing citizens to actively participate is needed. Achieving acceptance of alternative solutions requires building consumer confidence, which, in turn, requires articulating the value addition from these initiatives to facilitate a behavioral shift.

Another significant challenge identified was the delays in innovation due to the centralized approval process. While local bodies lack the authority to expedite approvals, innovations are often delayed by bureaucratic hurdles. Fast-tracking policy creation and ensuring transparency were suggested as essential strategies to upscale existing technologies. Addressing information asymmetry was also deemed crucial. Government bodies face a dearth of comprehensive and clear information necessary for improving policies. It was proposed that a bottom-up approach to policy creation, with localized policies harmonized globally, could mitigate this challenge.

Financial constraints were recognized as a significant impediment to upscaling technological innovations. Furthermore, businesses should play a more active role in sustainability efforts, emphasizing corporate responsibility in driving positive change. Further, collaboration emerged as a recurring theme essential for effective solutions. Stakeholders, including end-users, academia, industries, and policymakers, must collaborate to overcome challenges collectively.

One significant hurdle identified was determining who bears the risk in the event of innovation failure, highlighting the need for clear risk-sharing mechanisms. Moreover, blind adoption of technologies unsuitable for local environments is problematic, underscoring the importance of considering local feasibility.

Ensuring sustainable human resources and developing sustainable jobs were recognized as critical challenges. Proper documentation of innovations, including their context, was also emphasized as essential for wider adoption and understanding. However, there is currently a lack of information on the effectiveness and potential side effects of solutions, indicating a need for more robust documentation and evaluation processes.

Annex 1: Innovations Projects For Addressing The Challenges

Project 1: Resilient Earth Settlement for Tomorrow **Project owner**: GaiaTheEarth Foundation | *Contact person*: Babu Padmanabhan (drbabu@steerworld.com)	***Description***: The proposed project aims to develop an energy-positive, water-positive, zero-emission, and zero-pollution settlement that ensures well-being and a healthy, hygienic environment. It will use less steel and cement, eliminate air conditioning through compressors, and prioritize local, sustainable materials. The settlement will provide affordable, flexible, and modular living spaces, emphasizing health, hygiene, and green spaces for leisure. The project will incorporate best construction practices, align with natural cycles, and embody the Earthship concept.
Project 2: Personalised Natural Living **Project owner**: Potential Health Development | Contact person: Harini (harini@phd-health.com)	***Description***: The project aims to create protocols and systems that would help humans achieve longevity through interventions in health and food with the help of data and the backing of ancient practices. By distinguishing between needs and wants using health data, personalized health plans can be created. For instance, addressing a dopamine deficiency to reduce alcohol cravings. This approach involves deploying point-of-care devices in communities to gather universally accepted health markers. These markers help identify individual needs, allowing for the creation of customized protocols to improve health and nutrition, ultimately leading to better health outcomes for each person.
Project 3: Waste2Wealth Catalytix **Project owner**: Siddharth Tripathy |*Contact person*: Siddharth Tripathy (Director.entr@srmap.edu.in)	***Description***: The project aims to manage the waste generated in cities across the globe sustainably by creating a waste2wealth central hub and satellite hubs. The central hub gathers and enriches data from primary sources and satellite hubs. It conducts analytics, research, and capacity building to innovate waste conversion technologies for monetization and provides venture assistance and finance access. Satellite hubs host Waste2Wealth entrepreneurship boot camps and many other activities. Real-time data dashboards tracking waste generation and recycling per ward are also envisaged.
Project 4: Framework For Measuring Alignment Of Businesses To Human Needs. **Project owner**: Smita Mishra | *Contact person*: Smita Mishra (sm@fandoro.com)	***Description***: The project aims to develop a framework that businesses globally can use to measure their alignment with core human needs and thus also monitor their possibilities of survival over a mid to long-term timeframe. The project proposal outlines a structured approach. Beginning with thorough research and stakeholder engagement, the initiative aims to define core human needs in collaboration with experts in psychology and sociology. Subsequently, a comprehensive framework integrating both "hard" and "soft" elements will be developed, emphasizing strategy, structure, skills, and shared values. Pilot implementation across diverse businesses allows for practical testing, followed by the establishment of measurement metrics and feedback mechanisms. The proposal advocates for a global rollout, supported by ongoing monitoring and advocacy efforts to ensure long-term effectiveness and adaptation to evolving circumstances.
Project 5: Sustainable Innovative actions/practices for solving Water Crisis induced by Climate Change in Bengaluru City **Project owner*:*** Bangalore Water Supply and Sewerage Board | *Contact person:* Dr. Ram Prasath Manohar V, I.A.S (chairman@bwssb.gov.in)	***Description***: The project by BWSSB aims to mitigate Bengaluru's water crisis induced by climate change through advanced technological innovations and sustainable practices. Key proposed activities include implementing advanced water treatment plants, adopting chlorination and de-chlorination processes for zero E-coli in non-potable water, and promoting the use of aerators to reduce fresh water consumption. The project also involves smart metering for accurate water usage monitoring, biogas bottling for self-sustainable wastewater treatment plants, and AI-based monitoring systems to enhance efficiency. The intended outcomes include improved water quality, conservation, reduced contamination, and enhanced groundwater levels, ensuring a sustainable and resilient water supply for Bengaluru.

Photo Gallery