Biodiversity Bonds - Citizen Science for Community Building

The session discussed the current status and further work required for local policy adoption and alignment of global and national sustainability goals in towns and cities, as well as how to strengthen inclusive public engagement processes, which can serve as powerful venues for sustainability learning and action.

Speakers

- Ms Shonali Chenzira, Senior Manager – Science and Nature Education, WWF India
- Mr Jai Sharma, Muddy Lessons, Bengaluru
- Dr Jim Taylor, WESSA, South Africa and ESD ExpertNet
- Mr Satish Awate, Programme Director, Biodiversity Programmes, CEE
- Ms Meena Raghunathan, GMR Foundation and VASCSC, Ahmedabad

Presentations and Key Messages

Ms Shonali Chenzira (WWF India) introduced the concept of Citizen Science, illustrating it with various examples of plant and animal observations. These included globally participatory platforms like iNaturalist and e-Bird, initiatives engaging school students such as SeasonWatch, and specialised platforms for reporting phenomena like roadkills, turtle nesting, and invasive species. She explained some key benefits of citizen science, noting its low barrier to entry and its ability to promote a strong sense of community. Citizen science is also invaluable for understanding complex issues, such as bird migration and the impacts of climate change on flowering and fruiting patterns, while fostering significant learning opportunities.

Mr Jai Sharma (Muddy Lessons, Bengaluru) shared examples of local citizen science, including photo documentation of biodiversity, and action taken by working with the media to save lakes, grasslands, and green spaces in Bengaluru.

Dr Jim Taylor (WESSA, South Africa and ESD ExpertNet) shared impactful insights on citizen science and indigenous knowledge. While leading environmental education programmes at WESSA, he developed the Mini SAAS programme for biomonitoring water bodies. He recounted a compelling example from Durban where youth in a disadvantaged community, living downstream from a sewage treatment plant, used Mini SAAS to test effluent. They then shared the poor water quality results with both their community and the municipality. This evidence, gathered through citizen science, successfully mobilised action, leading to the issue being addressed between 2012 and 2016 – a clear demonstration of citizen science's power to measure, mobilise, and drive change.

Dr Taylor emphasised the high relevance of indigenous heritage practices in the current climate crisis, such as irrigation methods in water-scarce areas and drought-resistant crops from a time before the use of fossil fuels. He stressed the importance of foregrounding indigenous traditional knowledge in the face of climate change. Addressing concerns about the reliability of citizen science, he noted that researchers in Copenhagen have demonstrated how AI can be utilised to plot citizen science inputs and remove outliers, thereby ensuring data quality. He concluded by suggesting that citizen science can provide valuable inputs for all Sustainable Development Goals (SDGs), and it would be worthwhile to approach ministries reporting on SDGs to use citizen science data for performance reporting, such as for targets 6.3.2 and 6b.

Mr Satish Awate (CEE)

Shared examples of citizen science include:

  - Documentation of mango varieties by schools and community elders as part of the Western Ghats Eco-Clubs Scheme, and other fruits like jackfruit and *karvand* (Bengal currant or Carissa carandas) as part of the Environment Service Scheme.
  - Schools, youth, community members and local NGOs documenting varieties of crops, cultivated or harvested wild, diversity of fish, insects, etc, as part of the Maharashtra Gene Bank project.
  - Local youth documenting the presence of the Lesser Florican, which had not been seen for several years in Aurangabad, Maharashtra, by the formal scientific community.
- Cautioned that only English language platforms or those requiring internet could be exclusionary, and ways should be found to make the platforms more inclusive and address the digital divide.
- Highlighted the challenge of 'instrumentality' that could limit citizen science, where students contribute data for scientists. Advised that managers of citizen science initiatives should not consider participants from an instrumental perspective as contributors alone, but think about the opportunity for learning and empowerment on biodiversity, culture, science, language, math, etc, and access to the collated information and analysis.

- The consideration of language is essential not only from an inclusion aspect, but that science of knowledge would be the poorer for not including local languages, knowledge and intangible cultural elements (such as *Nili bhirbhiri* for Blue Mormon, or *Munjal pitte* for Paradise Flycatcher)
- Traditional knowledge is being lost, and citizen science programmes can provide an opportunity to forge partnerships with local communities that are holders of such knowledge. Addressing language and digital barriers is essential for their participation. For example, the citizen science platform on moths should make a serious effort to encourage farmers to participate, as they can both contribute knowledge and benefit from collated insights on pest attacks or pollination. The participation of fishers in documenting fish diversity would help in creating and updating wetland health cards for effective wetland management.

Ms Meena Raghunathan (GMR Foundation and VASCSC, Ahmedabad) recalled that in the late 1980s, CEE implemented the Ganga Water Quality Monitoring Programme in schools from several districts along the Ganga. She highlighted that even though internet-based tools were not available at that time, this was a citizen science programme where students were utilising science for field-based learning. Results from a large geographical area could be collated for advocacy with policymakers. Regarding the '*Sanskriti*' (culture) aspect, she suggested that AI could be used to address language barriers, and that there may be a possibility of collaborating with the Bhashini initiative for Indian languages.

Session Highlights

1. A rich variety and experience of citizen science programmes exist, and citizen science can be integrated into ESD programmes for knowledge generation and action
2. Further development of citizen science approaches in partnership with local communities that are directly dependent on bioresources could be highly relevant for community-based biodiversity conservation, climate adaptation, and natural resources management.
3. Approaches and platforms may be further strengthened to address language and digital barriers, using AI for data quality and language interfaces.

Quotes with attribution

"Citizen Science can be used to measure, mobilise and change." - Dr Jim Taylor, WESSA

Key Recommendations from the Session

1. Citizen science, especially in partnership with local communities, can be part of the repertoire of approaches for ESD in biodiversity conservation, climate adaptation, and other SDGs.
2. Case studies of citizen science that foreground community-based conservation, resource management, indigenous traditional knowledge, and climate adaptation would be a valuable contribution to Pillar 4 of the Greening Education Partnership.
3. Efforts may be made to utilise AI for enhancing language interfaces, improving data quality, and generating analysis and insights.

Who Acts?

- ESD sector
- AI sector
- Citizen science programme managers

Referred Case Studies

- e-bird
- In Biodiv Portal (all taxa website) Strand Life Sciences
- iNaturalist
- Tiger Watch
- Big 4 Mapping
- Dakshin
- Road Watch (WTI)
- Road Kills (WCT)
- Beach profile (TISS)
- City sparrow (BNHS)
- Common birds (BNHS)
- Pterocount
- Seasonwatch (NCF)
- Bio Atlas for butterflies
- Invasive bullfrog monitoring
- WESSA Mini SAAS
- Muddy Lessons
- Maharashtra Gene Bank monitoring programmes, RG Science and Technology Commission
- Western Ghats Eco-clubs Scheme, Govt of Maharashtra and CEE