

Summary of the CS4RRA Stocktaking Conference (Parallel Session 2)

Development of Citizen Science

Introduction

The report focuses on discussions on the theme "Development of Citizen Science." The session addressed the role of citizen science in data collection, climate services, and its integration into research and policy. Emphasis was placed on the need for high-quality data, effective training, and tailored tools to meet local needs. Key points included using apps for data collection, such as identifying plants and geolocating them, and the importance of data quality. The conversation highlighted the need for training citizen scientists, especially those without a science background, to ensure accurate data. The potential of citizen science in climate services was discussed, with examples from air quality monitoring in Africa, especially West Africa. The conversation also touched on the challenges of providing appropriate tools and training in urban and rural areas, noting the need for tailored approaches to meet local needs and capacities. The group discussion also focused on developing citizen science initiatives in urban and rural areas, emphasizing the need for multilingual tools to facilitate community engagement. Key points included understanding local information ecosystems, such as connectivity and language needs, before data collection. The conversation highlighted the necessity of sustainable data collection methods, including training local volunteers and donating equipment to schools. Challenges like project sustainability, language barriers, and the role of traditional scientists versus citizen scientists were also discussed.

Key Themes and Discussions

1. Definition and Role of Citizen Science

Citizen science involves the participation of non-professional volunteers in scientific projects, particularly in data collection and analysis. Discussions highlighted its potential in climate services, including air quality or climate impact monitoring, geolocation of plant species, and community-based data contributions and practices. The integration of trained individuals into the scientific community, emphasizing their role in citizen science was discussed. Citizen scientists do not need to be part of an organization, but can collect data in remote areas, through apps in local languages, with others responsible for interpreting the data. Citizen science has emerged as a powerful approach for collecting valuable data in remote areas, enabling local communities, researchers, and volunteers to contribute to scientific discovery. Low-cost sensors, mobile applications, and cloud-based data platforms can empower non-experts to gather and share real-time environmental, ecological, and climate-related information. By bridging the gap between scientific research and community participation, these tools not only enhance data collection but also foster local engagement, capacity building, and informed decision-making for sustainable development.

The meeting reflects over the importance of data quality in citizen science, noting that untrained individuals may not produce reliable data. The issue of defining who qualifies as a citizen scientist, suggesting that some background in science is necessary to ensure data quality. Emphasizes the need for training to ensure that citizen scientists can accurately collect and analyse data, highlighting the challenges faced by those without a science background.

2. Technology and Tools

The role of technology in citizen science was extensively discussed. Examples included:

- Development of apps for data collection and geolocation, particularly in urban settings.
- Leveraging simple technologies like SMS for rural areas with limited connectivity.
- Ensuring multilingual capabilities in tools to facilitate inclusivity.

The group emphasized the importance of tailoring tools to the local information ecosystem, considering connectivity, language needs, and infrastructure.

3. Urban vs. Rural Applications

The session identified differing needs and challenges in urban and rural contexts. The session discussed the different contributions citizen scientists can make in urban and rural areas, noting the challenges of data collection in rural areas

- **Urban Areas:** Greater access to technology but higher challenges in managing large-scale data.
- **Rural Areas:** Lack of access to technology necessitates simpler tools and extensive training programs.

The need for sustainable approaches, including donating equipment to schools and training local volunteers, was emphasized.

4. Capacity Building

Capacity building was a recurring theme, focusing on:

- Training citizen scientists to understand and use the tools effectively.
- Building local leadership capacity to oversee projects.
- Encouraging community involvement for long-term sustainability.

Efforts to empower local communities through equipment donations and training young students were seen as critical to avoiding data gaps after project completion.

5. Language and Communication

Language barriers were identified as a major challenge. Recommendations included:

- Providing tools and questionnaires in multiple local languages.
- Ensuring effective communication between project teams and participants to enhance understanding.

6. Sustainability and Project Longevity

Sustainability was a critical concern, with discussions focusing on:

- Integrating local leadership into project management.
- Establishing institutional budgets to maintain equipment and support long-term data collection.
- Creating mechanisms for ongoing community engagement and capacity building.

7. Integration with Policy and Research

The session explored ways to align citizen science with policy and research initiatives:

- Engaging ministries and stakeholders to incorporate citizen-generated data into planning and development strategies.
 - Avoiding mandatory inclusion of citizen science in all research, as it may restrict innovation.
 - Using citizen science insights selectively to address specific local needs.
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Citizen Science: Identifying Priorities

The conversation revolves around the importance of community engagement and training in citizen science projects, as yet demonstrated in the context of developing sustainable systems for solar energy plants. Speakers discuss the need for local volunteers to be trained to maintain and govern these systems, as seen in a project in Cameroon. They emphasize the significance of baseline data collection to ensure accurate and reliable data, and the necessity of selecting committee members with a science background to avoid errors. The discussion also touches on the challenges of handling data quality and the importance of building community capacity to understand and utilize for their benefit the data collected. The conversation ends with a focus on developing climate change initiatives.

Short-term strategic Priorities

- Establish a baseline data collection process to ensure the quality and reliability of citizen-generated data.
- Select community members with relevant science backgrounds to help with data collection and calibration.
- Train community members on the importance and potential uses of the data they collect, to increase their engagement and commitment.
- Develop capacity-building programs for researchers on how to effectively work with and analyse citizen-generated data.

Challenges identified

1. **Data Quality:** Ensuring accuracy when involving non-professionals in scientific projects.
 2. **Resource Constraints:** Limited access to tools, connectivity, and funding in rural areas.
 3. **Language Barriers:** Difficulty in providing tools and instructions in diverse local languages.
 4. **Project Sustainability:** Risk of data gaps after project completion due to a lack of local capacity.
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Recommendations

1. **Clear Objectives:** Define the role and contributions of citizen scientists in climate services.
2. **Baseline Assessments:** Conduct initial evaluations of information ecosystems to identify local needs and resources.
3. **Tailored Tools and Training:** Develop context-specific tools and provide appropriate training programs.
4. **Community Engagement:** Involve local leaders and schools to foster long-term sustainability.
5. **Policy Integration:** Align citizen science with development strategies and stakeholder priorities.
6. **Capacity Building:** Train community members, particularly students, to sustain data collection efforts.

Conclusion

Citizen science offers immense potential to enhance climate services and community engagement, but its success depends on careful planning, effective training, and addressing local needs. The session underscored the importance of sustainable practices, language inclusivity, and capacity building to ensure the long-term impact of citizen science initiatives. By integrating these elements, citizen science can significantly contribute to climate resilience and informed decision-making at local and regional levels.