

# Cartography and Sustainable Development: Developing an Agenda

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## Abstract:

Currently, the needs of the global population are not being met. The reasons for this are complex. Maps can help reduce complexity, to reveal spatial patterns that might otherwise go unnoticed, to pinpoint localized solutions. Sustainable Development (SD) is the process of meeting the needs of the present without compromising the ability of future generations to meet their own needs. SD addresses issues of environmental justice, social justice, and equity. Cartography relates to communicating these issues from a geographic perspective, selecting the most appropriate methods to analyze and visualize and communicate these issues. The aim of the Working Group on Cartography and Sustainable Development is to identify and employ cartographic practices and visualizations that promote understanding and effective decision making related to SD.

The Working Group on Cartography and Sustainable Development aspires to foster knowledge and understanding using maps, to ensure that current and future generations have access to human rights and the environmental resources needed to maintain quality of life. Mapping offers the potential to integrate diverse perspectives and themes (e.g. food, energy, land, water) to address sustainability issues. Maps are central for establishing priorities and evaluating progress towards SD (Ricker et al., 2020). The process of making maps can be a powerful way to bring actors together around different imagined futures to forge shared directions for action. There is no single use of cartography to achieve SD, this is an “all hands-on deck” call to explore and offer strategies on how to best employ cartographic expertise to address SD. Through this working group issues to be addressed will include (but are not limited to) thematic cartography and visualization techniques, data concerns, scale, and considerations related to social theory.

Distinctive and specific thematic cartography techniques are most appropriate to communicate issues related to SD based on the nature of the phenomena and the data at hand (Kraak et al., 2020). Different thematic maps tell distinctive stories (Caquard & Cartwright, 2014; Roth, 2020) which may enhance or hinder SD efforts. Cartography for Sustainable Development requires the employment of techniques related to vivid cartography, which connects with readers’ emotions and encourages them to act based on the new information presented in the map (Fish, 2020). Emotion plays an important role in cartography, influencing the connection (or lack thereof) with the reader (Pirani et al., 2020). When considering vivid maps it is important to be mindful of nuanced approaches of propaganda through persuasive maps (Muehlenhaus, 2013). Cartography for Sustainable Development needs to be mindful of selecting appropriate data analysis techniques as to not draw inappropriate or inaccurate conclusions (Kraak et al., 2018; Ricker et al., 2020). Despite this potential of maps, they are often critiqued for being presented as objective, obscuring normative decisions regarding what and whose data to include, how to analyse it, and how to display mapped phenomena (Kelly, 2020). For example, indigenous people define borders and classification of their landscape in vastly different ways than state actors – and thus the exclusion of their perspectives can perpetuate power imbalances (Reid and Sieber, 2020). In this way, cartographers hold an ethical obligation to consider whose view is being illuminated and who is being left out from a map (Ricker et al., 2020). This is where social theory is valuable and relevant in cartography and SD.

Cartography can be utilized by expertly trained cartographers and untrained map makers alike, using data from authoritative sources or from citizens. In this way cartography can be both a bottom-up and top-down approach. Both approaches are needed to gain a holistic understanding of any given SD challenge. Maps can act as powerful boundary objects that bring diverse actors together to better understand and investigate possible sustainable futures. To date, there is a disconnect between global decision-making processes and local knowledge or genuinely inclusive mapping practices that could be utilized to meet SD challenges. The local and the global perspective meet in maps. This movement to address SD is taking place at multiple geographic scales. Issues related to sustainability and planning include local challenges and solutions such as food-secure communities, water and sewage needs, waste reduction, energy efficiency, transportation planning, land use, green building, climate adaptation (Roseland, 2012). Grassroots movements are making great strides

in addressing sustainability through innovative solutions related to housing, agriculture and provision, transportation, community enterprises, digital commons and through culture and art (Nicolosi et al., 2018).

While at the global level the United Nations has established the global Sustainable Development Goals (SDGs), and associated targets and indicators facilitate a useful framework (United Nations, 2018). This first iteration of indicators offer nice examples of what can be mapped yet there are infinite ways to visualize these issues through the use of cartography. (Kraak, et al., 2020). These established indicators are a snapshot of how SD can be measured, there are far more issues and ways to measure and interpret SD, particularly at the local level. For these reasons, it is important that cartographers address SD at multiple geographic scales and links between different scales. Maps can help inform decisions to determine shared courses of action for a sustainable world.

To meet these aims, the ICA working group for Cartography and Sustainable Development proposes to hold a series of events to bring together ICA members, disciplinary experts, grassroots organizations, United Nations, government employees across scales (national and regional), and stakeholders including the public, to discuss and research important issues related to cartography and sustainable development. Possible topics and initiatives include:

1. establish guidance for (new and existing) cartographic principles and representation techniques to promote cartography as a method to help with the diffusion of information and innovation related to promoting sustainable development,
2. grassroots and top-down approaches to mapping,
3. data sources and formats,
4. geographic scale of the map and data collection practices,
5. missing data,
6. global and localized sustainable development indicators,
7. addressing data processing and visualization techniques required for cartography to promote sustainable development.

Through these efforts, the aim is to highlight regions experiencing challenges to sustainability, to identify where innovative solutions are taking hold, and to consider whose perspectives and values are being represented.

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