

Some reflections on ethics in the Brazilian cartography and its consequences in socioenvironmental problems

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Abstract:

This paper outlines the inception of a research agenda engaged in the proposition and organization of knowledge to relate ethics with the science and practice of Cartography in Brazil. Recognizing the critical role of maps for all citizens in achieving the United Nations' Sustainable Development Goals, we emphasize the necessity of establishing ethical principles for mapping activities. This consideration is crucial given the disparities and unique characteristics of each region on Earth. Of the 14 Global Fundamental Geospatial Data Themes (UN-GGIM, 2019) proposed by the United Nations Committee of Experts on Global Geospatial Information Management (UN-GGIM), at least eight directly tie to national topographic mapping. However, the global distribution of large-scale topographic maps is far from equal (Konecny et al., 2016), with the Global South experiencing the lowest coverage at the 1:25,000 scale. Focusing on the Brazilian context, we address issues pertinent to numerous developing countries with similar profiles. Mapping must be committed to enhancing the quality of life, beginning with the education of cartographers, whose training predominantly occurs in university settings (Camboim & Brandalize, 2013; Mendonça & Sluter, 2011). Teaching Cartography in countries with socioeconomic conditions, such as Brazil, can bring to the classrooms situations and discussions connected to society's severe social and environmental problems and their historical and geopolitical causes. Our experience highlights two key areas integral to the ethics in cartography discourse: (1) the deficiencies and inequities in topographic mapping coverage in Brazil and (2) the ethical implications of managing Brazil's socioenvironmental challenges.

Concerning the first point, we address the critical shortfall in comprehensive topographic mapping at essential scales, which should be produced by cartographic generalization. Consequently, Brazil has never had a complete, up-to-date reference mapping on the scales required to implement a land registry that could support land policies, causing consequences in the public policies for the occupation of the territory. Currently, the available mapping corresponds to 5.5% of the Brazilian territory at the scale of 1:25,000 and 26.4% at the scale of 1:50,000 (Silva & Camboim, 2020), which is insufficient to apply the legislation related to territorial planning. This outdated and unevenly distributed coverage is concentrated mainly in economically prosperous states, exacerbating regional disparities.

In contrast, topographic mapping in economically developed countries - with established cartographic traditions - differs significantly. Teaching Brazilian students about topographic map production requires presenting methods used in countries like France, Great Britain, Germany, and Switzerland while critically discussing Brazil's lack of equivalent mapping. We do not have enough documented best practices involving countries with a similar reality. There is no way to present this reality without a critical discussion and, therefore, one based on principles of ethics. Global data inequalities are a concern that also involves understanding the politics of data (Fisher & Streinz, 2021). World Development Report (World Development Report, 2021) emphasizes data inequality, noting that in developing economies, the unavailability of data is often due to the absence of necessary connectivity, storage and processing infrastructures, and prerequisite human labor and expertise.

The second issue explores how the lack of geoinformation in Brazil is either the cause or the result of the ethical problems in environmental disaster management. We illustrate this with the dam failures in Minas Gerais, a state of Brazil, where the absence of geoinformation hampered disaster response efforts. These emblematic events, which occurred in 2015 and 2019, caused the death of hundreds and have seriously contaminated the environment (Saes and Muradian, 2021). The firefighters faced difficulties with cartographic data from the affected areas. They tried to use proprietary data from private companies, but there were a series of obstacles: a first-degree ethical problem involving cartography. This problem

happens because, as previously reported, no adequate (detailed and updated) open topographic maps are produced as a public service in Brazil.

The population's lack of knowledge about cartography and everything that surrounds it, the interest of private companies, and the fragility caused by the cartographic void are all part of a disastrous agenda that characterizes severe ethical problems in cartography. The dissolution of the National Cartography Commission in 2018, amid reduced social participation and investment policies, further highlights these challenges.

Our perspective is not driven by an idealistic pursuit of universal good but by the need to address prevailing individual interests. We advocate for continuous education and research in Cartography to cultivate a critical mass capable of transforming the current state of affairs. Discussions on ethics must incorporate the global-local inequities in cartographic production and access, bringing voices from developing countries to the forefront to share diverse realities and solutions.

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