


## Chapter 13

# Counter-Mapping Practices in Land Regularization Through Geoinformation Technologies: The ÉPURA Group Experience in Cuiabá, Brazil

**Andrea Figueiredo Arruda**

*Faculdade de Arquitetura, Universidade Federal de Mato Grosso, Brazil*

**Cristina Delgado Henriques**

 <https://orcid.org/0000-0003-0100-5586>

*CIAUD, Faculdade de Arquitetura, Universidade de Lisboa, Portugal*

**Claudio Santos de Miranda**

*Faculdade de Arquitetura, Universidade Federal de Mato Grosso, Brazil*

### ABSTRACT

*This chapter outlines the experience of the Épura Research and Extension Group of the Federal University of Mato Grosso for the identification, characterization, and demarcation of informal settlements in Cuiabá (Brazil). This involved cooperating with the local residents' associations and public authorities in recognizing local demands and the need to open up urban land regularization processes. The cartographic issue is central to the recognition and legitimization of these territories and the use of geoinformation technologies, namely geographic information systems and unmanned aerial vehicles, can increase the speed and accuracy of the mapping of the neighborhoods. Additionally, the demands for urban and housing improvements and provision of space for everyday activities can be highlighted through the visualization and measuring tools that are embodied in these technologies. Furthermore, the experience requires the university to play a role in seeking more participatory and proactive practices within urban planning processes.*

DOI: 10.4018/978-1-7998-2249-3.ch013

## **INTRODUCTION**

The right to an adequate standard of living, including housing was recognized by The Universal Declaration of Human Rights as early as 1948. The new global agenda of the millennium on Sustainable Development Goals reaffirms the need to ensure access for all to adequate, safe and affordable housing (United Nations, 2015).

The concept of adequate housing according to the United Nations Human Settlements Programme (2014) is based on the principle that it must provide “more than four walls and a roof”, and give an assurance that it can meet the following criteria: legal security of tenure, affordability, habitability, availability of essential services, appropriate building materials, basic facilities and infrastructure, accessibility, a suitable location, and cultural identity. Although the right to housing is recognized as a constitutional right in many countries, there are still millions of families living in informal settlements, slums, inadequate and precarious forms of habitat. These self-produced territories are consolidated as the possible place to live, in light of the global demographic growth.

With regard to effective measures taken for land regularization, there is a consensus on the need for continuous efforts to identify, measure, characterize, and demarcate informal settlements so that they can be incorporated in an “intervention” agenda as a part of a broader public policy for housing, although there are still many challenges at the administrative, technical and political levels that need to be overcome. With more or less success, some experiences have already been taken to tackle this situation, mainly through the use of new technologies for surveying and land registration processes, to determine the priority areas.

This chapter presents the experience and practice of the Research Group on Urban and Regional Planning (Épura), at the Department of Architecture and Urbanism, Federal University of Mato Grosso. It combines a set of initiatives with the aim of giving visibility to informal settlements, by identifying and characterizing these territories, and comparing the local demarcations with those of the official cartography of the municipality. The purpose of this is to put on the agenda their recognition and address people’s urban demands.

Attention is drawn here to attempts to produce participatory mapping in three informal settlements within the municipality of Cuiabá (capital of the state of Mato Grosso, Brazil), by making use of geoinformation technologies. The methodology carried out to achieve this goal consists of identifying informal settlements and confronting them with data and demarcations of official records (municipal and federal) through the analysis and manipulation of georeferenced data in Geographic Information System (GIS). In a second stage, the boundaries of the urban demarcation and the households of the settlements are ascertained from Unmanned Aerial Vehicles (UAVs) images.

27 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: [www.igi-global.com/chapter/counter-mapping-practices-in-land-regularization-through-geoinformation-technologies/276115](http://www.igi-global.com/chapter/counter-mapping-practices-in-land-regularization-through-geoinformation-technologies/276115)

## Related Content

---

### The Impact of Web-Based Media on Evolution of Participatory Urban Planning and E-Democracy in Poland

Maja Grabkowska, ukasz Pancewicz and Iwona Sagan (2013). *International Journal of E-Planning Research* (pp. 1-16).

[www.irma-international.org/article/the-impact-of-web-based-media-on-evolution-of-participatory-urban-planning-and-e-democracy-in-poland/95053](http://www.irma-international.org/article/the-impact-of-web-based-media-on-evolution-of-participatory-urban-planning-and-e-democracy-in-poland/95053)

### Planning Infrastructure: Considerations for Regional Development

Phil Heywood (2012). *Regional Development: Concepts, Methodologies, Tools, and Applications* (pp. 1492-1504).

[www.irma-international.org/chapter/planning-infrastructure-considerations-regional-development/66188](http://www.irma-international.org/chapter/planning-infrastructure-considerations-regional-development/66188)

### ICT for Ethiopian Community Development

Solomon Negash (2005). *Encyclopedia of Developing Regional Communities with Information and Communication Technology* (pp. 370-376).

[www.irma-international.org/chapter/ict-ethiopian-community-development/11407](http://www.irma-international.org/chapter/ict-ethiopian-community-development/11407)

### Automatic Mapping of Physical Urban Problems Using Remotely Sensed Imagery

Nikolaos Lempesis (2023). *International Journal of E-Planning Research* (pp. 1-21).

[www.irma-international.org/article/automatic-mapping-of-physical-urban-problems-using-remotely-sensed-imagery/321156](http://www.irma-international.org/article/automatic-mapping-of-physical-urban-problems-using-remotely-sensed-imagery/321156)

### Tourism, Emigration, and Cooperation: A Strategy for Growth and Sustainable Development in a Community of Portuguese-Speaking Member States

Rossana Andreia Santos (2020). *Cross-Border Cooperation (CBC) Strategies for Sustainable Development* (pp. 192-215).

[www.irma-international.org/chapter/tourism-emigration-and-cooperation/248899](http://www.irma-international.org/chapter/tourism-emigration-and-cooperation/248899)