

Description of the research (International Cooperation Project – Brazil and United Kingdom):

The UN Convention on Biological Diversity promotes using an ecosystems approach (EA) to support delivery of ecosystem services and benefits (ESB) as a dynamic conceptualization of environmental quality. It is promoted as enabling an easier integration of environmental goods and services into economic processes and policies. However, many researchers suggest that an EA is ‘science in the making’ and emerging policy initiatives overlook complexities that stem from both uncertain scientific underpinnings and socio-economic divisions (Roberts 2014). While environmental justice scholars have long suggested that socio-economic hardship and the distribution of environmental goods and bads are correlated (Lindley et al. 2011), recent applications of intersectional theory suggest that practical experiences of exclusion from opportunity always intermesh with other divisions such as those based on race, social class, disability status, sexuality, age and geographical location (Brah and Phoenix 2013). There is then a need to address environmental and socio-economic vulnerability in an integrated manner.

Role	Name	Organisation	Division or Dept
Principal Investigator (UK)	Dr Sarah Bradshaw	Middlesex University	Law and Politics
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Co-investigator	Dr Ana Beatriz Mendes	Universidade Federal de Minas Gerais	Filosofia e Ciências Humanas
Co-investigator	De Heloisa Costa	Universidade Federal de Minas Gerais	Geographia
Co-investigator	Dr Rebecca Wade	University of Abertay Dundee	Science, Technology and Engineering
Co-investigator	Prof Lian Lundy	Middlesex University	Natural Sciences

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Research questions (Preliminary):



- What are the key sustainability issues in the target areas
- What are the key ES relating to these and what is their quality
- How do inhabitants experience the environmental quality locally and does this overlap with the identified ES (are ES significant to inhabitants)
- How do inhabitants use the local area and how do they access and impact on the key ecosystem services (ES)
- What gender based and socio-economic (vulnerability related) divisions in terms of access and framing of environmental values (ES)
- Do participants provide further framings of ES
- How can these divisions / exclusions / further framings be used to develop the ES approach in urban transformations (guidance)

Methodology

Interdisciplinary (social and environmental approach)

- Evaluation of biophysical structure or process, function of target areas (remote sensing, mapping of land uses, biodiversity, etc); Cascade Model
 - Evaluation of service potencial
 - Evaluation of service identified and/or appropriated by population
 - Evaluation of benefit, use value by population
- Development of vulnerability profiles integrating Ecosystem Services and Socio-economic aspects
- Development of guidance for ES application

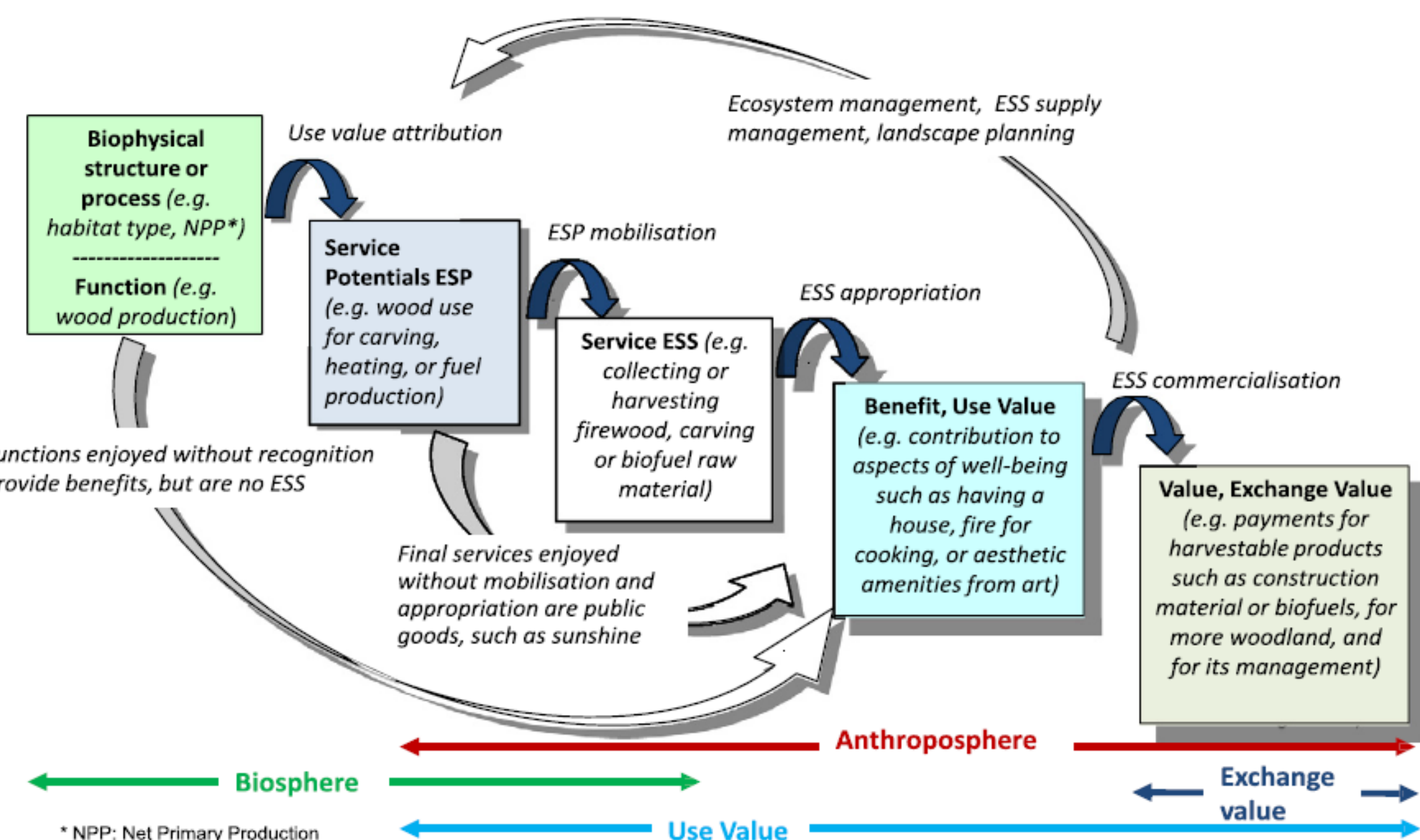
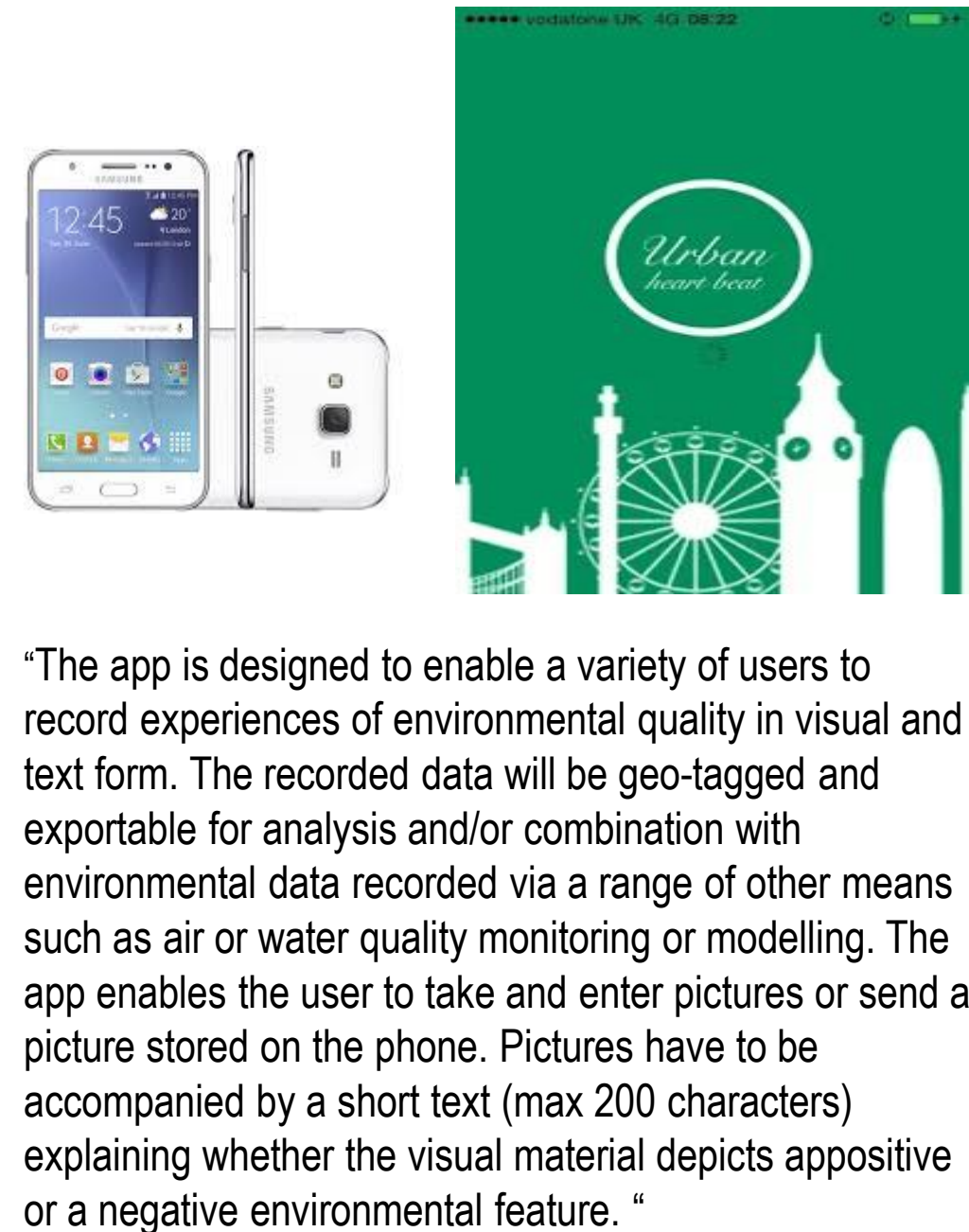


Figure from Spangenberg et al. 2014

Data collecting

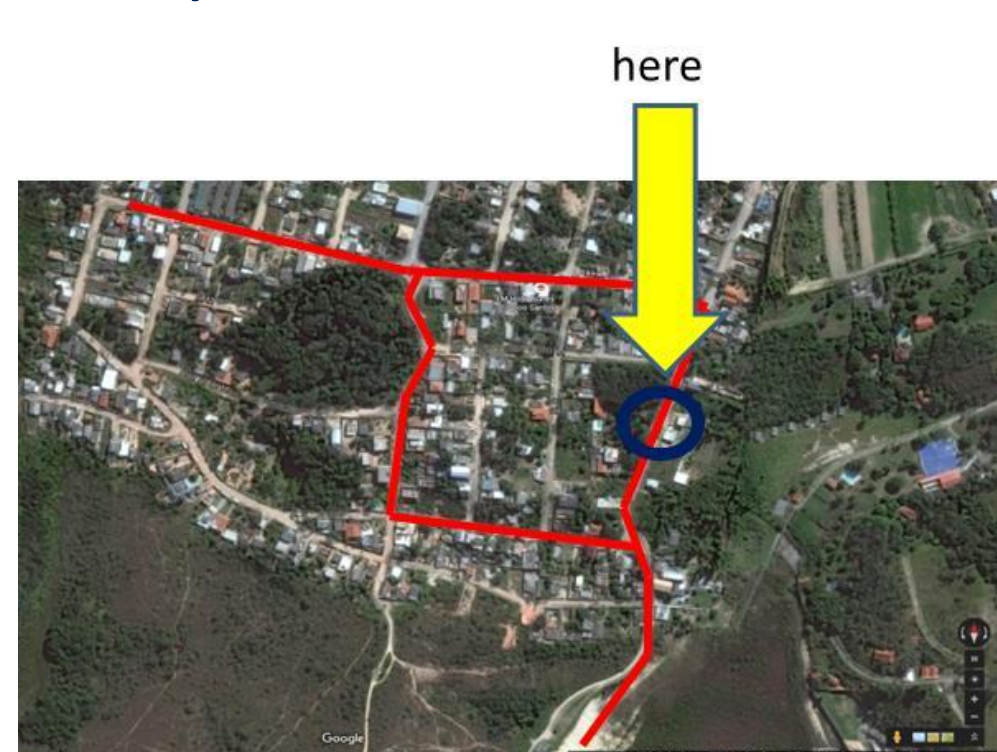
- Start data: August 2015
- Remote Sensing
- Mapping of land uses
- Identification of ES potential of target areas
- Interviews (30) and questionnaires (250) about social and environmental aspects of the neighborhood
- Urban Application to record positive and negative perceptions from population of the environment



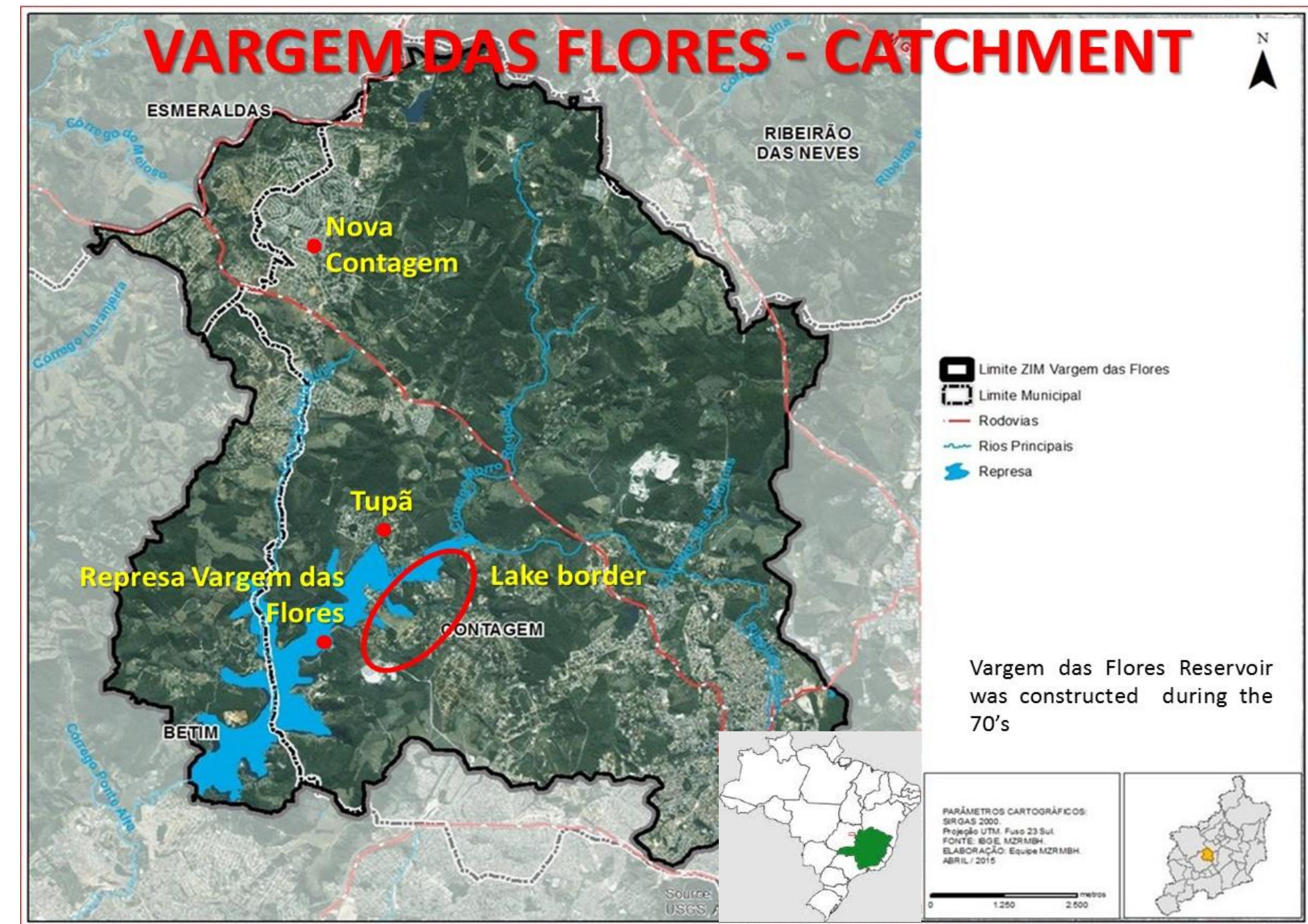
Participant :
It is a very bad street, completely eroded, where vehicles have a hard time when crossing.
(É uma rua muito ruim cheia de buraco aonde veículos encontram uma ser dificuldade para transporte)

Record of the app

Participant:
It is a place with a good shade and also where the birds sing, so it's a very good place.
(É um lugar com uma boa sombra e também aonde os passarinhos ficam cantando então é um lugar muito bom.)



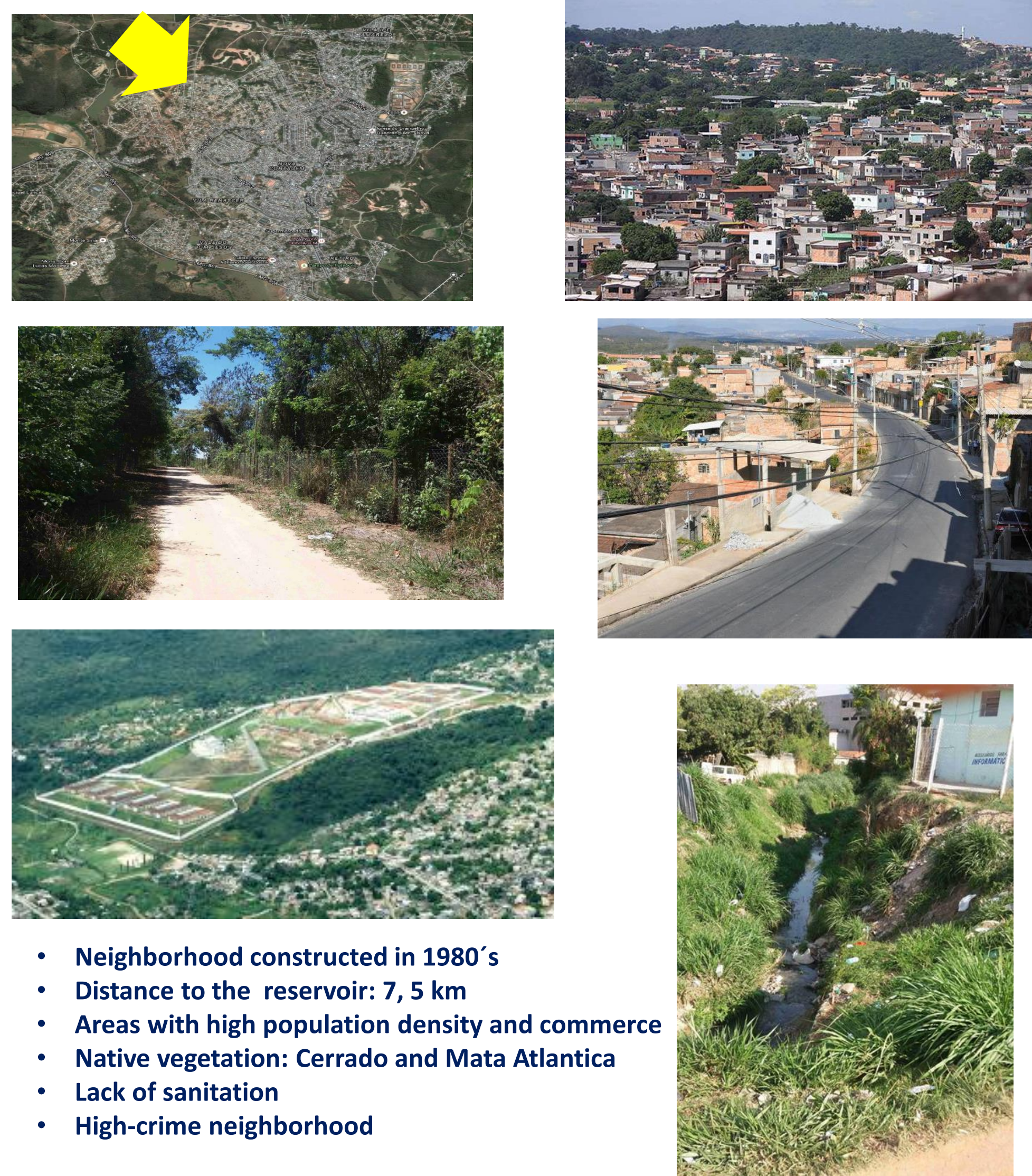
Study area: Vargem das Flores Catchment (Contagem, Minas Gerais States, Brazil)



Catchment area: 121 km²
Reservoir area: 5.1 km²
Drinking water production: 1.0 m³/s
Population: ~80,000 inhabitants

Neighborhoods studied:

Nova Contagem neighborhood



- Neighborhood constructed in 1980's
- Distance to the reservoir: 7, 5 km
- Areas with high population density and commerce
- Native vegetation: Cerrado and Mata Atlantica
- Lack of sanitation
- High-crime neighborhood

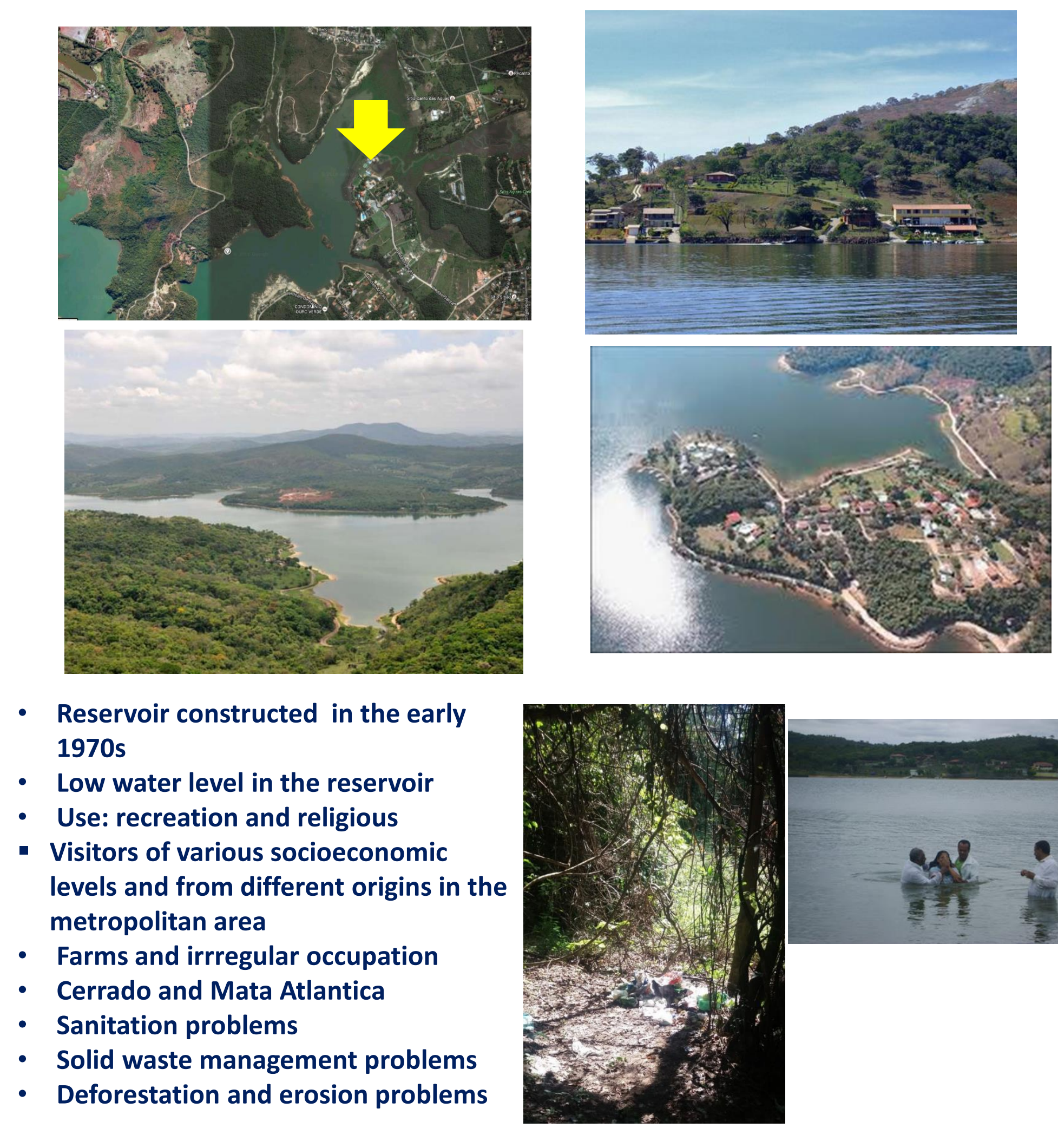
Tupã neighborhood



- Implanted during the 50 s
- Unpaved streets
- Reservoir silted
- Irregular occupation around the reservoir
- Wetland area with riparian vegetation
- Vegetation: Cerrado, Mata Atlantica

- Sanitation problems (open sewage)
- Solid waste management problems
- Deforestation and erosion problems
- Occurrence of invasive species

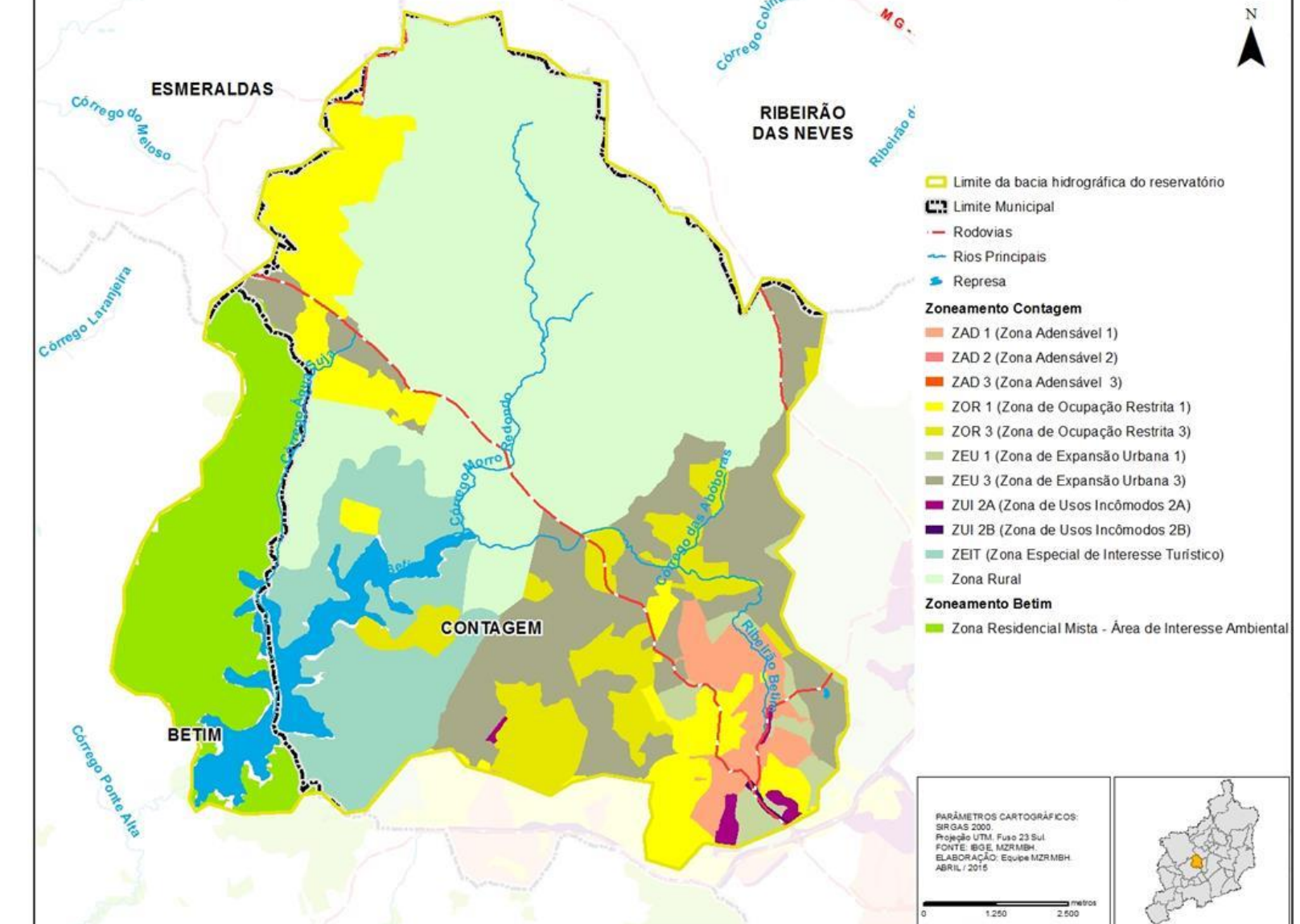
Reservoir border -Solar do Madeira neighborhood



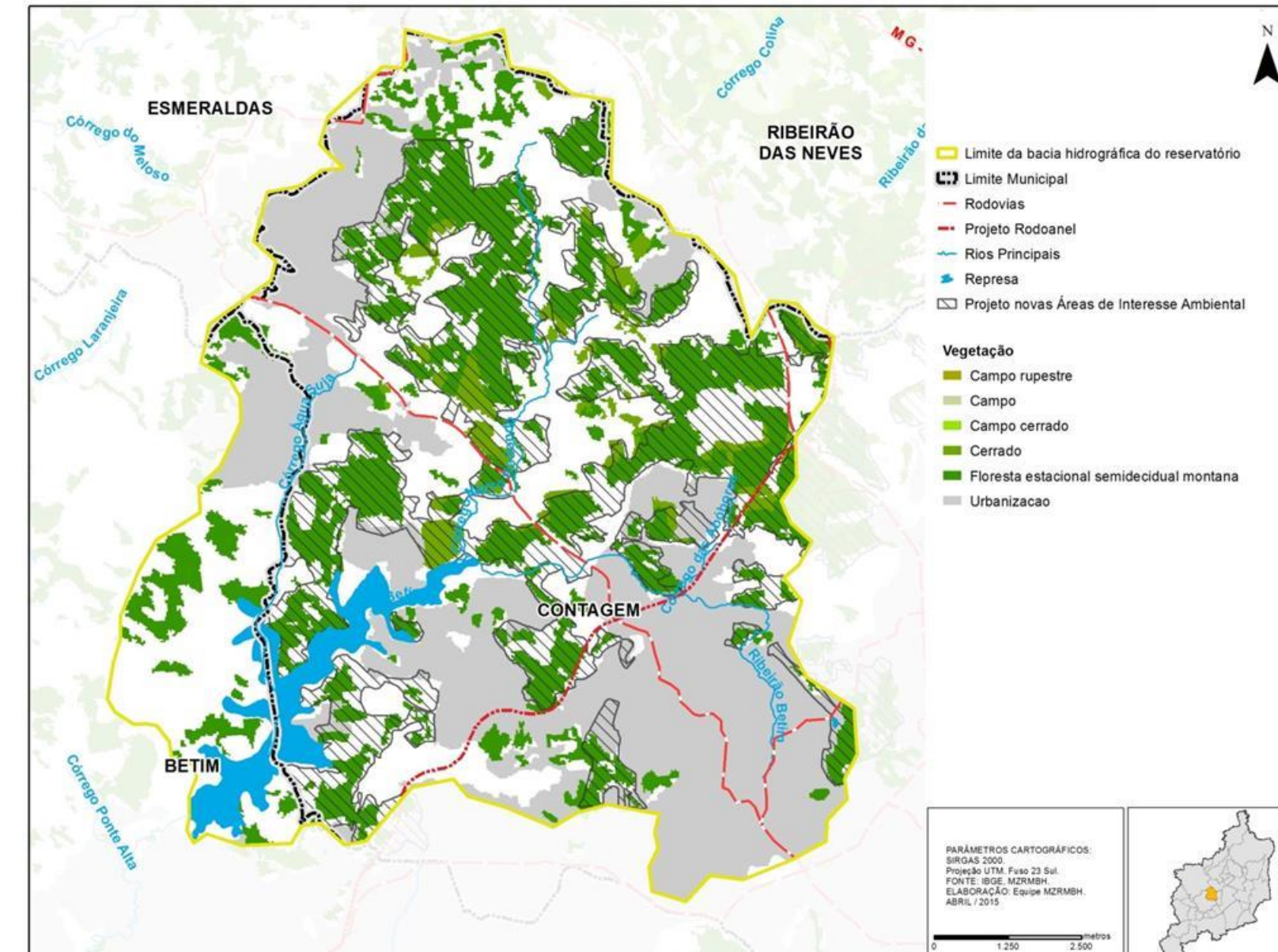
- Reservoir constructed in the early 1970s
- Low water level in the reservoir
- Use: recreation and religious
- Visitors of various socioeconomic levels and from different origins in the metropolitan area
- Farms and irregular occupation
- Cerrado and Mata Atlantica
- Sanitation problems
- Solid waste management problems
- Deforestation and erosion problems

Profiling of Vargem das Flores catchment

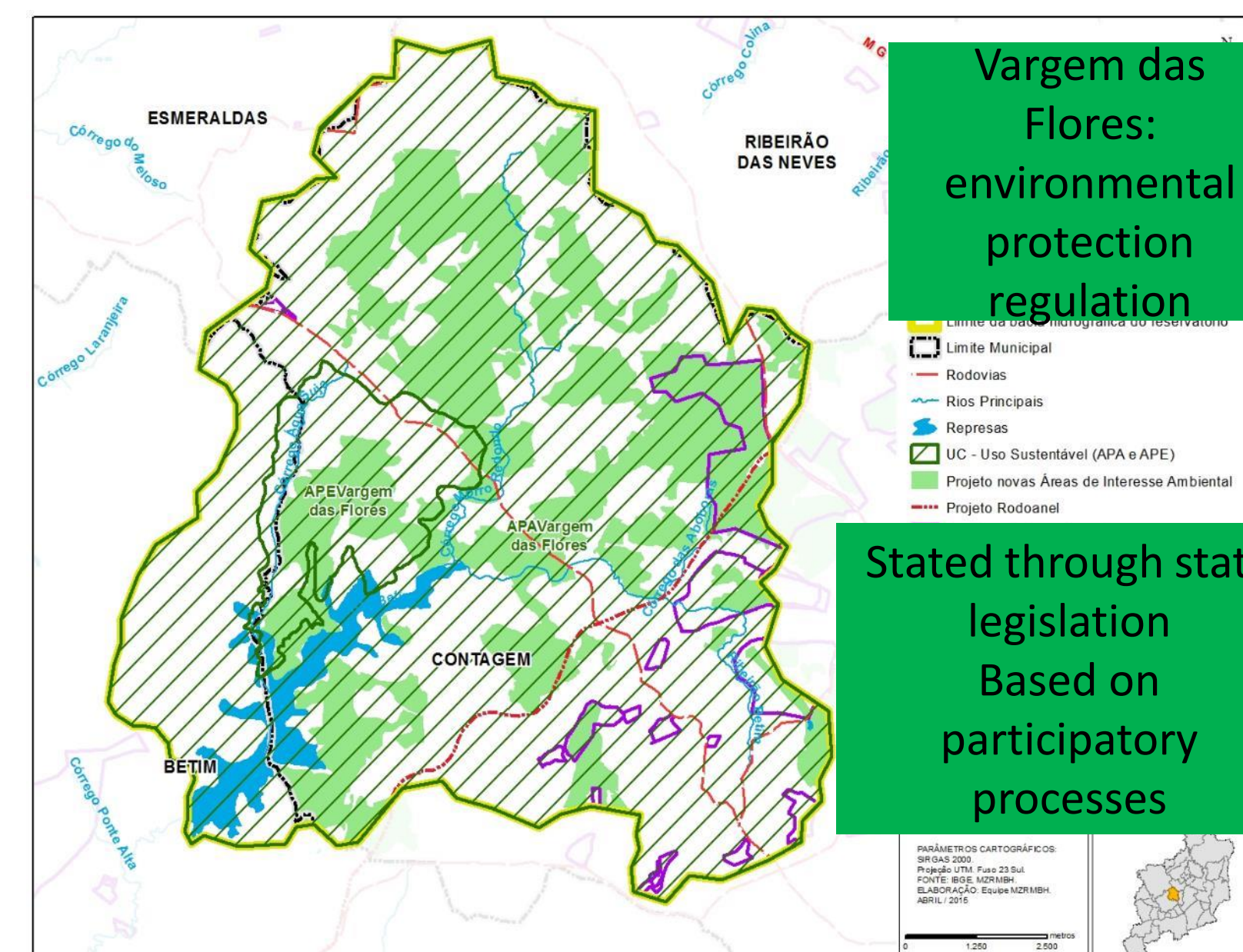
Clear division of occupation. More density downtown



Wide area of native vegetation (Cerrado and Mata Atlantica)



Vargem das Flores is Environmental Protection Area



Pressures: Irregular occupation, erosion, deforestation



Recreation use is concentrated around reservoir



Economic activity: metallurgic industry (few) , psiculture and agricultural activities (only local)

