

Integrating Teaching, Research and Problem Solving: An Experience in Progress in the Mucuri Valley Region (Brazil)

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ABSTRACT

An interdisciplinary project that seeks to integrate teaching, research and real-life problem solving is described. It concerns the question: how to achieve development of the Mucuri Valley region (in the states of Minas Gerais and Bahia, Brazil) respecting its natural resources? Geography is used as a guiding axis, having as technological support the Geographic Information Systems for the interdisciplinary dialogues in order to integrate data, information, techniques, methods and people from different fields of knowledge.

Keywords: Geographic Information. GIS. Interdisciplinarity. Problem solving. Mucuri Valley. Research and Action.

1. INTRODUCTION

Brazil is a country with a large territory (more than 8.5 million square kilometers of surface) and faces spatial and social inequalities that cause problems in the public and private sectors.

Just over a century and a half ago, the Mucuri River Valley was a dense forest, inhabited only by native tribes. When a development company was set up, the Mucuri River Trade and Shipping Company (1851-1861), during the second reign of the Brazilian Empire, the company built roads, established settlers and developed trade in the region. This has brought progress. However, nowadays, the Mucuri Valley reflects the carelessness with which its natural resources were treated. The destruction of the biodiversity and the fertility of its soils, as well as the degradation of its watercourses, is perceived. Carvalho [7] clarifies "it was not only nature that lost,

its inhabitants also lost (...) they must identify and recognize the problem (...) to gather the energies around their solution".

A challenging question arises ([9], p.10):

"How to promote the growth of the region, respecting its natural resources?"

To find answers to this question, a project is in progress - The Mucuri Project. Its objective is to develop studies that contribute to the sustainable development of the municipalities of the Mucuri River Basin in Minas Gerais and Bahia, Brazil (Fig. 1). It is a joint work of the Pro-Rio Todos os Santos and Mucuri Movement – MPRTSM and the Mucuri River Basin Committee, both with headquarters in the city of Teófilo Otoni, in partnership with FUMEC University, Federal University of Vales do Jequitinhonha and Mucuri – UFVJM, Teófilo Otoni *Campus* and University Center of Belo Horizonte – UniBH, all located in the State of Minas Gerais. The team is multidisciplinary with members of the MPRTSM and Basin Committee, and researchers from the universities involved. The project includes teaching and research activities in the search for solving problems in society. Its purposes are:

- i) To articulate sectors of society, to mobilize and motivate leaderships and communities for socio-environmental problems, visiting all municipalities;
- ii) To collect data and disseminate information on the environmental and socio-economic conditions of the Region.

Item i) is coordinated by MPRTSM and Basin Committee (non-academic) and item ii) is coordinated by a faculty member of FUMEC with the collaboration of researchers from UFVJM and UniBH.

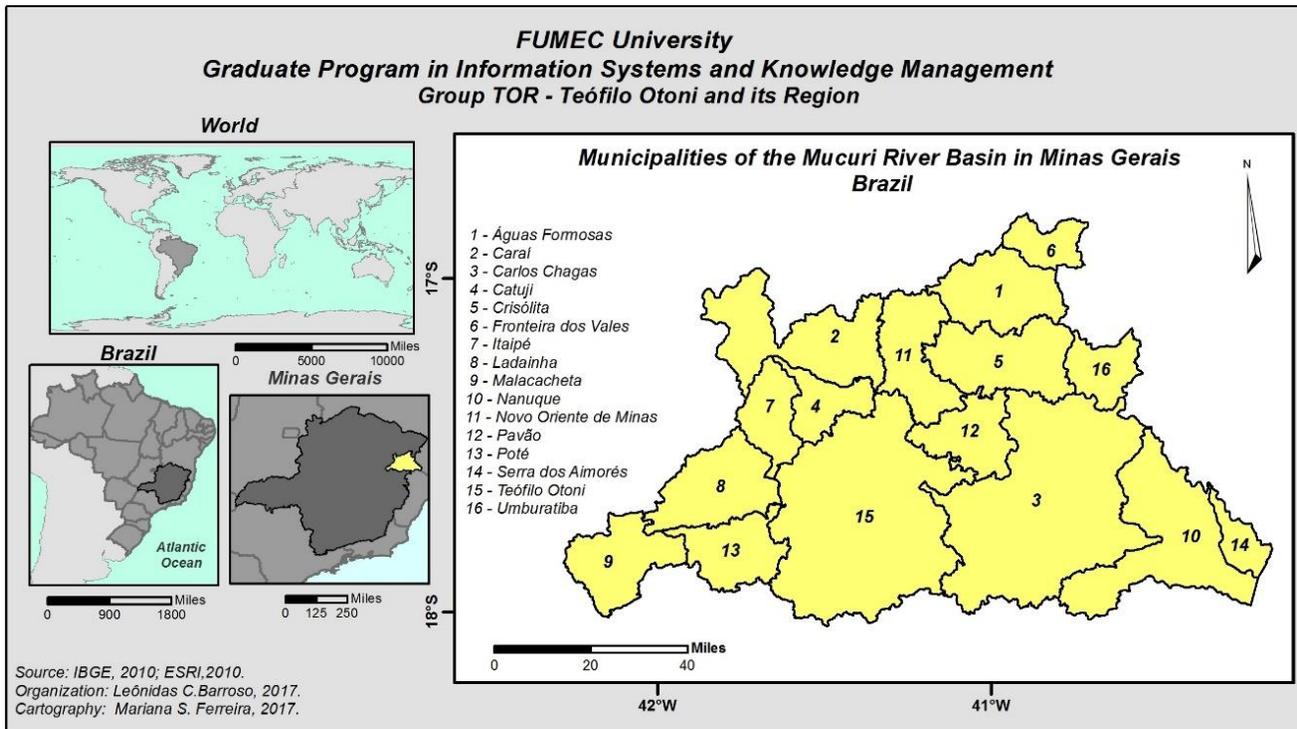


Figure 1 – Municipalities of the Mucuri River Basin in Minas Gerais, Brazil

Its expected results are:

For the university

a) Systematization of the environmental, socioeconomic, cultural, infrastructural and geo-historical knowledge of the municipalities and, as a natural consequence, the elaboration of articles for submission to scientific journals and papers to be presented at Conferences.

b) To graduate new masters and doctoral students with in-depth knowledge of the basin (scientific education) and for middle and elementary school teachers in the community, the preparation and application of refresher courses.

For Society

To provide, on the Web, relevant information and maps for municipalities dealing with cultural, social, geo-historical, environmental and economic aspects.

With the use of the technological support of the Geographic Information Systems (GIS), data, information, techniques, methods and people from different fields of knowledge are integrated. The GIS [8] provides resources for the digitization and

georeferencing of documents, as well as providing several methods of spatial analysis. Geographic data is treated and represented on maps, allowing the visualization and interpretation of spatial information. In addition, methodological procedures are complemented with documentary, bibliographical and field research.

According to Longley *et al.* ([10], p. 4) "Almost everything that happens, happens somewhere. Knowing where something happens can be critically important."

2. THE ROLE OF THE PROJECT PARTICIPANTS

MPRTSM

The organization MPRTSM intends to promote a second expedition to mobilize the communities (item i), with the aim of encouraging the participation of all municipalities in the basin, involving schools and local leaderships. Motivational lectures and workshops with the participation of local communities should be offered as well as listening to the residents through interviews to identify their

perception of the environment. The MPRTSM will count on the support of the Mucuri Basin Committee. The works will be coordinated by the environmentalist Alice Lorentz Faria Godinho, founder of the Pro-Rio Todos os Santos and Mucuri Movement, and president of the Mucuri Basin Committee.

UNIVERSITIES

The Graduate Program in Information Systems and Knowledge Management of the FUMEC University, through the Group TOR - Teófilo Otoni and its Region, coordinated by Leônidas Conceição Barroso, has been conducting interdisciplinary studies that include the city of Teófilo Otoni and the Mucuri Valley region ([4], [5],[6]). This group has interacted with the reality of the basin and its main city, producing articles for journals and national and international conferences, using geographic science as the guiding axis. The Federal University of Vales do Jequitinhonha and Mucuri-UFVJM, Teófilo Otoni Campus, with the Regional Policy Research Group, coordinated by Márcio Achtschin Santos, has been conducting research on the social and historical reality of the eastern state of Minas Gerais ([1], [2], [3]). The University Center of Belo Horizonte, through the researcher and writer Magali Maria de Araújo Barroso, together with Cultural Association of the German Descent of Teófilo Otoni – ACDATO, represented by the writer Dalva Neumann Keim, are responsible for the elaboration of a book, to be delivered in Portuguese and German. It will deal with the memories of the descendants of the Germanic immigrants, who arrived in the region in the mid-19th century and the 1920s. It is an action that will contribute to the search of the historical and cultural identity of the region, as well as making available to the German community information about the families of those who have left Germany in search of new opportunities.

Other studies will be developed aiming to contribute in the search of the historical and cultural identity of the region, for the diversity of the people that inhabited it. The first inhabitants of the region were the *Botocudo* Indians. In addition to the Indians and descendants of Germanic origin, the other pioneers in the settlement of the Mucuri Valley were Brazilians, mainly from the north of the state of Minas Gerais, Quilombolas (descendants of slaves), Lebanese, Italians and Chinese. University researchers hope to

contribute by collecting and processing data from various sources, trying to answer the guiding question and its ramifications proposed by MPRTSM. To this end, some students of the masters and doctoral programs will produce their theses and dissertations and scientific articles.

3. INITIAL WORK

An initial question, presented in [9], that emerges as preparation to the guiding question of the project (How to promote the growth of the region respecting its natural resources?) is: How to recover the historical and cultural identity of the people from the Region? It is sought to answer it through the following three subprojects:

Continuing education for teachers of History and Geography of secondary and elementary education (in progress).

Continuing education, promoted by the university, represents a possibility of connection between the bases of university action, that is, it is there teaching and researching, and when this knowledge transcends it, it contemplates extension. The focused disciplinary contents of geography and history situate the student in the region in which he/she lives, and establish a relationship with the other disciplines of the curriculum, to involve them in an interdisciplinary learning process.

The pilot course was already worked out with teachers of History and Geography of the teaching network of the municipality of Teófilo Otoni, in modules of 16 hours, which will have lectures and interactive activities about the main themes involving the Mucuri Valley. From the course, the teachers will develop projects, with field works, treating subjects related to the community as, for example, the geographical space, the memory and the patrimony.

Applying the concepts of location and temporality, using as reference home, school, neighborhood and municipality sharpens reasoning so that teachers and students can trace and analyze maps of space that go unnoticed and at the same time, awake the motivation to indicate problems that call for a solution. Another important aspect in the regional study is to allow the relationship of the local and the national whole, establishing its differences and similarities, since the

textbooks, usually because they are produced by authors from different regions, address examples, which are often far to be meaningful to students.

Working in the classroom approaching the knowledge of History and Geography within the reality lived by the student will enable the formation of identities. In this way, students and teachers would distinguish the relationships established in their locality, intervening more consciously in the environment in which they live. The social and environmental aspects in the Mucuri Valley are considered to be alarming, in a situation that requires urgent community interventions, which can be done from critical and active citizens.

Researchers involved

- Dr. Márcio Achtschin Santos
- Dr. Mariana da Silva Ferreira

Public sectors involved

- Federal University of Jequitinhonha and Mucuri Valleys at Teófilo Otoni
- Municipal Secretary of Education of the Municipality of Teófilo Otoni

Interdisciplinary work: Geography, History, Education

Status: The course was taught in August, 27-29, 2017 and at the moment it is under evaluation.

Memory of the German Immigration in the Mucuri Valley (in progress)

In the settlement of the Mucuri Valley, the region received immigrants from various European countries, mainly Germany. The pioneers arrived in 1856 and there was a second arrival around the 1920s. Territorial areas around the headquarters, small or medium size, were sold to the Germans where they could develop their agricultural skills, ensuring the survival of families and solidifying the permanence of people of different cultures in those lands, generating an identity of their own. The reports of Lutheran Church records, newspapers, and reports from that time are mainly about the arrival of immigrants, adverse conditions encountered, the enclosed forest with the inherent dangers, all the infrastructure to be done, and the presence of indian people who were opposed to the occupation of the land by the settlers

because the indians considered themselves masters of that land.

However, after more than one hundred and sixty years after the arrival of the pioneers, and almost a hundred, of the landing of the second lane, the search of the descendants is to recover the memory of the Germanic immigration in the Mucuri Valley to evaluate the sense of belonging, the permanence of traditions and the effective contribution to create a peculiar culture.

Researchers involved

- Dr. Magali Maria de Araújo Barroso
- Mrs. Dalva Neumann Keim

Private sectors involved:

- University Center of Belo Horizonte- UniBH
- Cultural Association of the German Descent of Teófilo Otoni - ACDATO.

Interdisciplinary work: Geography, History, Culture, Religion.

Status: Book to be delivered in December 2018.

The Santa Clara road in the nineteenth century: path of "people" and experiences in the Mucuri (completed)

Paths, passages and roads have always composed the scenarios in the most diverse times of human history. The Santa Clara road, which began in 1857, was not simply a means of communication and transportation in the hinterland of Minas Gerais, but a way that contributed to concentrate people of different worlds and interests. And, each in their own way, eventually helped in the formation of the Mucuri Valley.

That way, the objective of this work was to rewrite the multiple characters and their experiences (with reference to the most varied sources, from official documents, letters, reports and periodicals), leaving a memory of the construction of this region of Minas Gerais. The proposal was to rescue the various expressions produced in the Mucuri Valley in the 19th century, with the Santa Clara road as a boundary. Likewise, the goal was to identify the tracks of this route, joining geographic studies with history. To identify the traces of the road, several field works

were carried out, seeking to record in GPS the geographical coordinates of the paths traveled and their current landscapes in photographs, besides listening to the popular imaginary.

Rescuing the origins of those who built the Mucuri Valley is a way to keep a regional identity alive. Resurfacing the Santa Clara road [5] fulfilled the dual function of rebuilding the lost tracks of the road and recovering an important part of the history and culture of the Mucuri Valley.

Researchers involved

- Dr. Márcio Achtschin Santos
- Dr. Leônidas Conceição Barroso

Interdisciplinary work: Geography, History, Culture.

Figure 2 shows the cover of the book published in August, 2017.

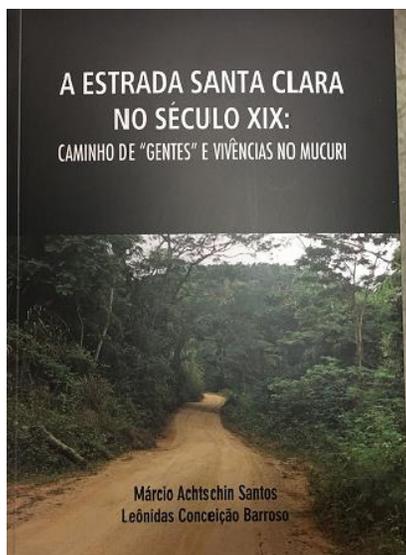


Figure 2- Book: The Santa Clara road in XIX century: Paths of “People” and Experiences in Mucuri.

4. CONSIDERATIONS

The Mucuri project aims to contribute to the solution of the problem: how to promote the sustainable development of a poor region in the states of Minas Gerais and Bahia, Brazil, in harmony with its natural resources. By involving teaching, research and solving problems in society, multiple characters act: Academic organizations (Universities: FUMEC, UFVJM and UniBH) and non-academic (MPRTSM,

ACDATO, Basin Committee); University Extension (Academy and Society); Research (Theory and Practice); Different sectors of society, public and private (mobilization and motivation of communities).

Geography is used as the guiding axis, however, only its research methods are not enough to solve the problem. Its solution is complex and requires intensive interdisciplinary work, involving knowledge of various disciplines, such as: Geography, History, Climatology, Cartography, Geographic Information Systems, Biology, Economics, Architecture, Engineering, Demography, Public Policy, Sociology, Mathematics, Statistics.

During the process, challenging activities emerge, highlighting two of them considered fundamental: the first one is the coordination of a multidisciplinary team, since each researcher or specialist brings in his/her baggage a scientific way of thinking of his/her own discipline and one must look for a common language for interdisciplinary dialogues; the second one is to make available to the communities the results of research in a language accessible to lay people in science. However, these challenges can be overcome as a predisposition for collaborative work.

5. REFERENCES

- [1] M. Achtschin Santos. A Filadélfia não sonhada: escravidão no Mucuri do século XIX. Teófilo Otoni: n/c. 2008.
- [2] M. Achtschin Santos. (org.) As Gerais distantes das Minas: fragmentos da história do Vale do Mucuri. Teófilo Otoni: n/c. 2009.
- [3] M. Achtschin Santos; I. Sorel. História da Ocupação no Vale Mucuri. In: M. A. Fernandez (Org.) Expedição Rio Todos os Santos - Rio de todos que te queremos santo. 1 ed. Belo Horizonte: Movimento Pró Rio Todos os Santos e Mucuri, 2006, v. 1, p. 42 – 52.
- [4] L. C. Barroso. Potentiality and Limitation of an interdisciplinary work (invited paper). In: 18th World Multi Conference on Systemics, Cybernetics and Informatics, 2014a, Orlando. Proceedings Post- Conference. Orlando –Fl.-EUA: International Institute of Informatics and Systemics, 2014. v. único. p. 1-4. Available: http://www.iiis.org/CDs2014/CD2014SCI/SCI_2014/Abstract.asp?myurl=SA209LQ.pdf. Accessed: June, 12, 2017.

- [5] L. C. Barroso. Nas Trilhas da Estrada Santa Clara. Revista Iberoamericana de Sistemas, Cibernética e Informática, p. 57-62, V. 13, N. 2 - Año 2016. ISSN: 1690-8627. Available: <http://www.iiisci.org/Journal/riSCI/FullText.asp?var=&id=CB339DA16>. Accessed: June, 12, 2017.
- [6] L. C. Barroso; M. M. A. Barroso. Teófilo Otoni e demais municípios do Vale do Mucuri-Brasil: Uma abordagem Interdisciplinar. Revista Iberoamericana de Sistemas, Cibernética e Informática, v. 11, p. 1-7, 2014. Available: <http://www.iiisci.org/Journal/riSCI/FullText.asp?var=&id=CA498QK14>. Accessed: June, 12, 2017.
- [7] J. C. Carvalho. In Expedição Mucuri, A. L. F. Godinho (Org.), MPRTSM: Belo Horizonte, 2010. p. 7.
- [8] M. S. Ferreira; L. C. Barroso; J. F. Abreu. Sistema de Informações Geográficas, Análise Espacial e Geografia. Memórias da Décima Quarta Conferencia Iberoamericana en Sistemas, Cibernética e Informática. Orlando (EUA). International Institute of Informatics and Systemics, 2015. ISBN: 978-1-941763-27-8.
- [9] A. L. F. Godinho. In Expedição Mucuri, A. L. F. Godinho (Org.), MPRTSM, Belo Horizonte, 2010. p. 10
- [10] P. A. Longley *et al.* Geographical Information Systems and Science. John Wiley and Sons. 2007.