Cycling Tourism and Sustainable Development in Brazil: Assessmentof Thematic Quality for Route Classification

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Extended Abstract

Since the community of Feijão stream, located in the municipality of Brumadinho, state of Minas Gerais, was reached by the disaster of the rupture of the Feijão dam in 2019, cycle tourism has been promoted through the improvement of urban infrastructure and reframing of the cultural landscape through touristification. Ecotourism through cycling is considered a means to foster sustainable development and a source of income for this community, which was a victim of one of the most recent environmental disasters. Furthermore, the use of bicycles is interconnected to almost all Sustainable Development Goals (SDGs) [1], providing a compelling reason to promote the activity. However, in Brazil, the classification of ecotourism trails is regulated by a standardization that establishes parameters for the classification of cycling routes [2] in practice for greater safety. In conjunction with this, cartography applied to tourism [3] through the production of thematic maps is an excellent tool for territorial planning and management, facilitating the organization and characterization of cycling activities, as well as fostering the promotion, preservation of the environment, and accident prevention.

Thus, the aim of this work was to assess the thematic quality resulting from the use of geoprocessing [4-6], as a support tool for the classification of routes with cycling tourism potential, in accordance with Brazilian regulations. It was proposed an experimental route totalling 5.98 km, divided into 27 segments, with the majority located within the urban zoning of the community. The comparison of the practical results of the standard with the use of 2 (two) freely available Digital Terrain Models (DTMs) With 1 (one) DTM considered of superior quality and higher reliability, all in TIFF matrix format [7] was carried out. The reference DTM was obtained through LiDAR [8] flight conducted in 2020 by the Fototerra company, with a spatial resolution of 1 m, but with restricted access to the user community. The first freely obtained DTM was from the Alaska Satellite Facility - ALOS PALSAR database [9], with a spatial resolution of 12.5 m and from 2011. The third DTM corresponds to SRTM, from the United States Geological Survey's database [10], with a 90 m spatial resolution, from 2012, and free access. Using QGIS [11], the sections were represented and classified according to terrain variability in terms of elevation, through hypsometric profiling.

The results obtained demonstrated the feasibility of using these freely available spatial relief databases for planning and management of cycling tourism activities. It is concluded that geoprocessing techniques are still underutilized in the field of cycling tourism. Moreover, the few existing applications are limited to use in conjunction with Global Navigation Satellite Systems (GNSS). It should be highlighted that the work has great social and scientific relevance, considering the increasing improvement in the quality of life in cities, including the expanding networks of cycling lanes and the need to better utilize natural, technological, human, and financial resources available.

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