

Geospatial Technologies Applied to International Boundaries – The Case Study of Guinea Bissau

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SUMMARY

Modern geospatial technologies applied to frontiers' issues involve remote sensing data, including as satellite imagery, orthophoto or orthoimages, global navigation technology (GPS/GNSS) and Geographical Information System (GIS) tools, which have been used since last decade for boundary delimitation, demarcation or revision. This paper intends to present the case study of Guinea Bissau (GB) boundary which was the first African Portuguese colony to settle its boundaries. It was delimited by a Franco–Portuguese convention signed in Paris on May 12, 1886. Later, ratification was exchanged in Lisbon, on August 31, 1887. The demarcation was completed between 1900 and 1905 and recorded in memoranda prepared by the commissioners. For historical reasons Tropical Research Institute (IICT) concentrates a unique, vast and diverse amount of information concerning the borders of those countries. The scope of this study is to explore new methodologies, and approaches for border studies, making use of geospatial technologies. A Boundary Geographical Information System (BGIS) is being developed based on GIS technology which is a powerful tool to integrate disparate datasets, visualize, analyze and model spatial and territorial specificities. Historical-diplomatic information will be articulated with the geospatial data, in order to be included into the geodatabase and to recover the location of the borderlines. The original data were submitted to an analogue-digital conversion, followed by and image processing techniques, including morphological methods combined with other image enhancement approaches, were applied to remove residual artifacts, improving in this way the documents appearance and reducing storage volume. These methodologies prepared the images for further application of optical character recognition (OCR) before integrating them into the geodatabase. Multitemporal studies based on satellite high resolution imagery were carried out to understand land surface changes on the borderland, mainly where the borderline is defined by landscape features, such as, a thalweg of a river, or a ridge line. The study also takes advantages of global navigation technology (GPS/GNSS) to validate precise location of boundary beacons. Complementary tasks, include organization, digitalization and classification of the archive concerning the diplomatic treaties of the boundary delimitation, sketches, beacon frontier coordinates, demarcation reports, maps, aerial photographs. The final output will make this information useful and accessible, in a digital platform, supporting GB authorities thus promoting cooperation and facilitating public access. The BGIS will be used for present and future management of GB boundaries and as an instrument for policy making.