VI Simpósio Nacional de Geomorfologia / Regional Conference on Geomorphology
Geomorfologia Tropical e Subtropical: processos, métodos e técnicas / Tropical and Subtropical Geomorphology: processes, methods and techniques
Goiânia, 6 a 10 de setembro de 2006 / Brazil, Goiânia-GO, September 6-10, 2006

PALEODRAINAGE AND EPHEMERAL RIVERS MAPPING IN THE LOWER SHABELLE ALLUVIAL PLAIN, SOMALIA.

PARON P.[1]
[1] FAO-SWALIM Project, Kalson Tower, 3rd Floor, Crescent Road, Parkland, Nairobi.
P.O.Box 30470-00100 Nairobi, Kenya, pparon@faoswalim.org
paoloparon@yahoo.it,

ABSTRACT

Within the FAO-Swalim Project (www.faoswalim.org) an integrated landform map of part of the Jubba and Shabelle river basins was performed by means of the analysis of existing bibliography (including the grey one), Remote Sensing, DEM analysis and geomorphometry with no field checks, due to the lack of security and inaccessibility of the area. The Shabelle river basin is one of the main rivers of the Horn of Africa and it forms a single river system together with the Jubba River. The Shabelle joins, seasonally, the Jubba River few tens of kilometers before the latter enters the Indian Ocean, in the proximity of the city of Kisimayo. The two rivers have their higher reach in the Ethiopian highlands of the Ogaden region, and part of the Jubba River flows also through the northeastern Kenya, while only their lower tracts are within Somalia. This study focuses on lower tract the Shabelle River (Uebi Shebeli) basin, characterized by the presence of a wide (from 15 to almost 100 km) and very gently sloping alluvial plain, NE-SW trending, with an elevation that ranges from 100 to 20 m a.s.l., confined on the NW by the Bur metamorphic basement complex, on the SE, by a coastal dune (175 to 80 m height) which rims the coast for more than 1300 km and separates the narrow coastal plain (less than 2 km wide) from the Shabelle alluvial plain, and on the SW by the Jubba river course. From a geological point of view the alluvial plain overlay the so-called Coastal basin (Abbate et al., 1993; Ali Kassim et al., 1993 and 2002) that is downthrown toward the sea by a system of normal faults parallel to the coast (NE-SW), that have interested the basement and most of the Tertiary sequence (reflected also in the regional Bouguer Gravity Anomalies). Under GIS environment it was performed an integrated analysis of: multitemporal, multi-resolution and multispectral Remote Sensing images (Landsat, Spot and Ikonos); SRTM DEM datasets; historical flood extents; semi-automatic topographic feature extraction; morphometric parameters; and a new semi-detailed landform map. This resulted in the identification of the main geomorphological elements and in the mapping of the paleodrainage and ephemeral tracts of the lower Shabelle River plain. As a result, a map of the lower Shabelle River fluvial geomorphology and paleodrainage characteristics is here presented. These data can be applied in the search for shallow aquifers and for the hydraulic engineering modeling and restoration in the same area. Many acknowledgements are due to all the FAO-SWALIM staff and Dr. Zoltan Balint in particular, for the support during this research.

Keywords: fluvial geomorphology, paleodrainage, landform mapping, GIS and Remote Sensing, Shabelle river.