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Assessment of Impact of Urbanization in Drainage Urban Systems, Cali-Colombia

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Abstract : Cali, the capital of Valle del Cauca and the second city of Colombia, is located in the Cauca River Valley between the Western and Central Cordillera that is South West of the country. The topography of the city is mainly flat, but it is possibly to find mountains in the west. The city has increased urbanization during XX century, especially since 1958 when started a rapid growth due to migration of people from other parts of the region. Much of that population has settled in eastern of Cali, an area originally intended for cane cultivation and a zone of flood from Cauca River and its tributaries. Due to the unplanned migration, settling was inadequate and produced changes in natural dynamics of the basins, which has resulted in increases in runoff volumes, peak flows and flow velocities, that in turn increases flood risk. Sewerage networks capacity were not enough for this higher runoff volume, because in first term they were not adequately designed and built, causing its failure. This in turn generates increasingly recurrent floods generating considerable effects on the economy and development of normal activities in Cali. Thus, it becomes very important to know hydrological behavior of Urban Watersheds. This research aims to determine the impact of urbanization on hydrology of watersheds with very low slopes. The project aims to identify changes in natural drainage patterns caused by the changes made on landscape. From the identification of such modifications it will be defined the most critical areas due to recurring flood events in the city of Cali. Critical areas are defined as areas where the sewerage system does not work properly as surface runoff increases considerable with storm events, and floods are recurrent. The assessment will be done from the analysis of Geographic Information Systems (GIS) theme layers from CVC Environmental Institution of Regional Control in Valle del Cauca, hydrological data and disaster database developed by OSSO Corporation. Rainfall data from a network and historical stream flow data will be used for analysis of historical behavior and change of precipitation and hydrological response according to homogeneous zones characterized by EMCALI S.A. public utility enterprise of Cali in 1999.

Keywords : drainage systems, land cover changes, urban hydrology, urban planning
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