PRIORITIZATION OF SUB WATERSHEDS FOR SOIL CONSERVATION USING REMOTE SENSING AND GIS IN VICTORIA CATCHMENT

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Watershed management approach has been found to be very effective in soil and water conservation. However, in the case of large reservoirs, it is not practical to treat the entire watershed as a single unit for conservation due to limited availability of resources. Therefore, conservation planning aiming at sustainable development of sloping lands requires assessment of present status of land and mapping priority sub watersheds, where soil conservation measures are urgently required based on their susceptibility to land degradation. This research was carried out with the view of generating required information to identify the priority sub watersheds within the Victoria catchment (59,947 ha), for conservation planning. Terrain parameters including slope, flow directions, sub watersheds and catchment boundary within the study area were delineated using spatial modeling techniques on Digital Elevation Model (DEM). Soil erosion was evaluated using four erosion causative factors. Land cover map was prepared using supervised classification approaches with LandSat satellite image and an index map for land cover was developed. Soil erodibility index was assigned for each soil type based on erodibility values. An index of slope and rainfall erosivity was derived according to steepness and rainfall intensity. Erosion prone areas were identified using cumulative erosion index, which was computed from the rating given to four erosion causative factors. Priority sub watershed map was derived considering the extent subjected to very high and high erosion ranks. The study demonstrated a rapid method for generating information on erosion risk and prioritizing watersheds according to potential erosion hazard. Seventy eight sub-watersheds were evaluated and found that 26 of sub-watersheds covering 22.8% of area belong to high and very high erosion risk categories. Further studies are suggested to improve accuracy and information content by incorporating more detailed maps combining with field verification.

Key words: GIS, Remote Sensing, Soil Conservation, Soil erosion, Watersheds