

Geospatial Information for Evaluating Watershed - Related Payment for Environmental Services in the Densu River Basin

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ABSTRACT

Water is indispensable for human existence but its availability and accessibility for societal use still remains a major challenge for many developing countries including Ghana, and in its Densu basin. The role of vegetation in ensuring good water quality for societal use cannot be over emphasized. However, with the increasing vegetation degradation in the Ghana driven mainly by the country's increasing population, water security challenges can be envisaged. There is the need to establish mutual relationship between upstream land users who can conserve vegetation and downstream water users through the payment of compensations. Hence, the study seeks to assess the effects of land cover changes in the Densu river buffer zone on the level of sedimentation in the basin and to identify the land use practices in the basin that could affect the quality of water at the downstream. The study also seeks to assess the feasibility of the PES mechanism in the basin and outlines the forms of compensation payable in the PES mechanism. The study employed GIS and Remote Sensing techniques in the detection of vegetation land cover change and used the questionnaire, focus group discussions and photography to identify land use practices that promoted and prevented river sedimentation. The study revealed that there was a general decrease in the vegetation cover of the RBZ in the basin from 1990 to 2000 such that whilst the dense land cover in the RBZ of the basin decreased by 256.9203 km² (59.7%), sparse and average land cover increased by 238.2768 km² (529.5%) and 56.4933 km² (4.0%), respectively. Logging, expansion of settlements, slash and burn agriculture, quarry were identified as some of the major land use practices that promoted river sedimentation whilst agro- forestry, afforestation, and tree cropping were identified to protect rivers from sedimentation. The study proposed the payment of direct money, subsidized farm implements and free access to education as some of the compensation forms that can encourage vegetation conservation.

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