

Session II – Envisioning New Approaches to Managing Great Deltas, Great Rivers, and Great Lakes

12:00 Noon

Spatial Modeling for Decision Support in Selecting the Most Suitable Areas of Inland Valley Wetland Cultivation to Support Africa's Green and Blue Revolution

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Abstract

Throughout West and Central Africa there is increasing pressure for agricultural development as a result of population growth and efforts to increase food security. The WCA is yet to see a green revolution, so badly needed for its subsistence farmers who constitute an overwhelming proportion of WCA's 350 million population, food security, and economic progress. The inland valley (IV) wetlands are land-units of greatest promise for fast forwarding Africa's green and blue revolution. The IV wetlands have high potential for growing agricultural crops due to: (1) easy access to the river water, (2) significantly longer duration of adequate soil moisture to grow crops when compared with its adjoining uplands, (3) rich soils (depth and fertility), and (4) geographical well distribution throughout WCA (and hence local access to subsistence farmers). However, 90% of all WCA's current agriculture is concentrated in uplands which have very poor soils and scarce water resources. Thereby, it is increasingly felt that the best way to fast-forward green revolution (more crop per unit area) and blue revolution (more crop per drop) in WCA is to focus on its soil-water rich and hitherto highly under-utilized or un-utilized inland valley (IV) wetlands.

The overarching goal of this research was two-fold. First, develop remote sensing based on automated and semi-automated methods of mapping IV wetlands. The strengths and limitations of these methods are discussed for the Volta and Limpopo river basins in Africa and compared with Ruhuna river basin in Asia. Second, develop spatial models to select most suitable areas for the IV wetland: (i) cultivation, and (ii) preservation. The process involved: (1) identification and development of necessary spatial data layers, (2) providing weightages to these spatial data layers based on expert knowledge, (3) development of spatial models, and (4) running spatial models to determine most suitable areas for IV wetland cultivation.