

Use of geographical information system and remote sensing techniques for planning culture-based fisheries in non-perennial reservoirs of Sri Lanka

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Abstract

The presence of a wide areal extent of small-sized village reservoirs offers a considerable potential for the development of culture-based fisheries (CBFs) in Sri Lanka. To this end, this study uses geographical information systems (GISs) and remote sensing (RS) techniques to determine the morphometric and biological characteristics most useful for classifying non-perennial reservoirs for CBF development and for assessing the influence of catchment land-use patterns on potential CBF yields. The reservoir shorelines at full water supply level were mapped with a Global Positioning System to determine shoreline length and reservoir areal extent. The ratio of shoreline length to reservoir extent, which was reported to be a powerful predictor variable of CBF yields, could be reliably quantified using RS techniques. The areal extent of reservoirs, quantified with RS techniques (RS extent), was used to estimate the ratio of forest cover plus scrubland cover to RS extent and was found to be significantly related to the CBF yield ($R^2 = 0.400$; $P < 0.05$). The results of this study indicated that morphometric characteristics and catchment land-use patterns, which might be viewed as indices of biological productivity, can be quantified using RS and GIS techniques.

Key words

catchment land uses, culture-based fisheries, geographical information system, remote sensing, reservoirs.
