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## Determining High Potential Aquaculture Production Areas — Analysis of Key Socio-economic Adoption Factors

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### Abstract

Aquaculture production increased with an average 10 % annual growth rate since 1990 and today some 90 % of aquaculture production takes place in developing countries thus providing livelihood and income especially to marginal groups without access to resources such as agricultural land.

A project coordinated by the WorldFish Center is developing a GIS-based decision support model to facilitate the prioritising of national research, development and extension strategies and targeting of development assistance for aquaculture in the partner countries (Cameroon, China, Bangladesh, Malawi). Stakeholders need to know where and under which conditions certain aquaculture technologies would be feasible. Factors that determine the adoption of certain technologies include agro-physical (rainfall, temperature, soil type, slope) and socio-economic (availability of land, labour, and capital, infrastructure, input supply) characteristics. The input of agro-physical factors in the model is straight forward by generating maps showing the rainfall or temperature of a certain area. However, many important socio-economic variables are not explicitly spatially distributed (such as household land holdings or education).

Four main stages are used to integrate socio-economic variables in the GIS based decision support model: **(1)** identification of key factors for successful adoption of target technologies on the micro-level, **(2)** development of indicators on the meso-level, **(3)** generation of input data sets (geo-referenced) for the GIS model, and **(4)** assignment of ranking/weights to the indicators. The paper outlines the conceptual framework used for the socio-economic part of the decision support model and highlights some of the inherent methodological challenges. Results of the analysis of aquaculture adoption in Bangladesh and Malawi, representing different levels of intensification of aquaculture production are presented and discussed. Spatial econometric techniques are used to assign ranks to the developed indicators.

**Keywords:** Adoption of aquaculture, decision support model, developing countries, spatial econometrics