Employing Geographical Information Systems in Fisheries Management in the Mekong River: a case study of Lao PDR

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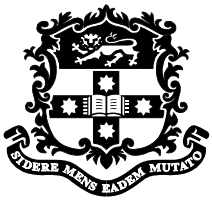

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ABSTRACT

The objective of this research is to employ Geographical Information Systems to fisheries management in the Mekong River Basin. The study uses artisanal fisheries practices in Khong district, Champasack province Lao PDR as a case study. The research focuses on integrating indigenous and scientific knowledge in fisheries management; how local communities use indigenous knowledge to access and manage their fish conservation zones; and the contribution of scientific knowledge to fishery co-management practices at village level. Specific attention is paid to how GIS can aid the integration of these two knowledge systems into a sustainable management system for fisheries resources.

Fieldwork was conducted in three villages in the Khong district, Champasack province and Catch per Unit of Effort / hydro-acoustic data collected by the Living Aquatic Resources Research Centre was used to analyse and look at the differences and/or similarities between indigenous and scientific knowledge which can supplement each other and be used for small scale fisheries management.

The results show that GIS has the potential not only for data storage and visualisation, but also as a tool to combine scientific and indigenous knowledge in digital maps. Integrating indigenous knowledge into a GIS framework can strengthen indigenous knowledge, from un processed data to information that scientists and decision-makers can easily access and use as a supplement to scientific knowledge in aquatic resource decision-making and planning across different levels.

The results show that when scientific and indigenous knowledge are both stored digitally in GIS databases, a variety of analysis can be done. Multiple layers or visualising functions in ArcGIS are an example of ways in which indigenous and scientific knowledge can be combined in GIS. Maps of deep pools and important fishing grounds gathered using GPS and indigenous knowledge provide base maps of aquatic resources in the study area. The attribute table associated with the map links characteristics of each point, including fishing gear and species found in each pool as well as spawning grounds and migration periods. This information is useful for management and planning purposes.

This research illustrates that mental maps and GIS digital maps can be used for fisheries management at different levels. Where mental maps are suitable for communicating with the local community and have the potential for use in fisheries co-management in small-scale fisheries; GIS may be appropriated for data storage and analysis at provincial and national levels, it can be used as a communication tool amongst stakeholders to monitor and understand the aquatic environment.

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ACRONYMS

CNY	Chinese New Year
CPUE	Catch per Unit of Effort
DAFO	District Agriculture and Forestry Office
DLF	Department of Livestock and Fishery
FAO	Food and Agriculture Organization
FCZs	Fish Conservation Zones
FIP	Fishery Program
GPS	Global Positioning System
GIS	Geographical Information System
IK	Indigenous Knowledge
IDRC	International Development Research Centre of Canada
LARReC	Living Aquatic Resources Research Centre
LMRB	Lower Mekong River Basins
LNMRC	Lao National Mekong River Commission
MRC	Mekong River Commission
MAF	Ministry of Agriculture and Forestry
NARI	National Aquatic Research Resources Institute (project)
NAFRI	National Agriculture and Forestry Research Institute
NGOs	Non-government Organizations
PAFO	Provincial Agriculture and Forestry Office
SK	Scientific Knowledge
SEAFDEC	Southeast Asian Fisheries Development Centre
STEA	Science, Technology and Environment Agency
UNESCO	United Nations Educational Scientific and Cultural Organisation
UTM	Universal transverse of Mercator
UXO	Unexploited Ordnance