

**CAPTURING INDIGENOUS KNOWLEDGE IN FISHING
COMMUNITIES OF BEACH SEINE FISHERY OF CHILAW, SRI
LANKA FOR INTRODUCING A CO MANAGEMENT STRATEGY**



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Dissertation submitted as a requirement for the M. Phil. Degree in Fisheries
Management of the University of Kelaniya,

Sri Lanka

May 2014

ABSTRACT

The coastal fisheries sector in Sri Lanka supports livelihood of many people in the country and beach seine fishery still exists in spite of modernization of the marine fisheries industry to a certain extent. In the Northwestern province of Sri Lanka, about 20% of the beach seine sites in the country are found. Being a traditional fishing method, it is hypothesized that indigenous knowledge about fish communities, accumulated over generations, would be potentially used for the fisheries resources management. The main objective of present study was therefore to investigate the level of indigenous knowledge of beach seine fishers in Chilaw area which could potentially be utilized for management of the fishery.

In the present study, beach seine fisheries in nine locations ('Padus') in two fishing sites in Chilaw fisheries administrative district were investigated from November 2010 to May 2011 by collecting fishing data were for 157 active fishing days using logbook recording method. For comparison of catch efficiencies of beach seines, catch per unit area (CPUA) was computed from the daily catches of individual beach seines using approximate area covered by the net. Daily catch data of 9 selected beach seines was transformed into $\ln(\text{CPUA}+1)$ and analyzed to investigate temporal and spatial variations of species composition of fish catches.

Pair-wise parametric correlation analysis indicated that several species were caught in beach seines simultaneously possibly due to species associations and interactions. Spatial and temporal variations of fish species composition in the beach seine landings as ordinated by principal component analysis (PCA) were found to be influenced by temperature variations and wind speed.

The data on species composition of beach seine landings were patternized using self-organizing map (SOM) algorithm in the unsupervised artificial neural network (ANN) to ordinate each beach seine haul in a two-dimensional hexagonal lattice. The results of SOM and ANN indicated that there are similarities in species composition in the landing of beach seine in a given area during a particular time. This suggests that the trends and patterns in species composition in beach seine landings have a potential utility value for defining management strategies for the fishery. Possibilities of acquiring information about such trends and patterns through fishermen's knowledge were then investigated.

Fishermen's indigenous knowledge (IK) about the species occurrence, their spatial and temporal distribution and factors influencing catch effectiveness in the beach seine fishing was quantified using a psychometric approach, Likert Scale. Furthermore, beach seine fishermen was interviewed to understand the traditional method of predicting occasional high fish yield and experienced fishermen were found to use various indirect indicators related to the occurrence of fish schools. Accordingly, beach seine fishermen use their IK for increasing catch efficiency using skillful approaches such as fixing appropriate cod-end type.

As such, it is recommended that for sustainable management of beach seine fisheries in Sri Lanka, resource users should be empowered to make them active participants of decision making process for fisheries management so that fishermen's IK can be effectively incorporated in fisheries co-management.

KEY WORDS

Fisheries co-management, Indigenous Knowledge, Cod-ends, Natural Indicators, Artificial Neural Networks