

Book Review

Assessment methodologics and management proceedings of the World Fisheries Congress, Theme 5, edited by Gary T Sakagawa (Oxford & IBH Pub. Co., New Delhi) 1995, pp. xiii+195, Hard cover, Rs 480/-
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Fisheries are complex, highly stochastic, non-linear systems with many variables, most of which are hard to estimate. Consequently, fishery management involves difficult tasks of ensuring ecological sustainability while satisfying demands for increased production towards economic and social development. Many a great world fisheries have crumbled, not necessarily due to mismanagement, but either due to environmental changes, like, appearance of *El Nino*, or due to man made changes like, overfishing, habitat change and water pollution. Despite a large volume of published information, the literature on fisheries contains an array of incompatible jargons, definitions, symbols and survey methods. However, the need of the time is to have concerted efforts directed towards the standardization of data collection, analysis and presentation of results in a most appropriate format.

An endeavour to develop an approach for the stock assessment and management of fishery resources for sustainable yield is reflected in the contents of the book under review. It is the outcome of workshops and sessions of Theme 5 and in the computer-use workshop of the World Fisheries Congress held in Athens, Greece from 5th to 8th May 1992. A multitude of problems and approaches in the assessment and management of fisheries, ranging from freshwater to marine ecosystems, both small and large, and extending through tropical to temperate to polar climatic regions, are discussed.

Nine papers relate to sub-theme I: Application and Research of fishery-independent techniques for assessing fish and zooplankton populations and 15 papers are grouped under the sub-theme II: research results using quantitative techniques for stock assessment with mainly fishery dependent data. Methods of assessment range from the classical approaches like acoustic sampling, electrofishing to emerging methods like the fractal geometry. The computer-use contributions range from packaging

conventional analytical techniques to dealing with the rapidly evolving field of computer graphics. There is a rightful emphasis on developing user-friendly software packages and applications.

Number of path-finding and futuristic observations have been documented. Fishery survey methods, like, exploratory fishing, sampling of fish eggs and larvae, and hydroacoustic measurements have a number of limitations, particularly sampling errors, statistical errors in sampling fast moving fish populations, and biases in extrapolating observations to population and resource potential estimates. Recent advances in hydroacoustic techniques have to a certain extent, improved the reliability for assessing population size structure, numerical abundance and spatial variations in biomass and thus have an advantage of being less selective than traditional survey techniques. Despite of being a popular means of sampling fish stocks in relatively small water bodies like rivers, lakes and coastal lagoons, electrofishing has generated a growing concern about the safety of the operators and about physiological damage to the sampled fish, which are usually released alive. It is not convincingly clear, how some of the visual census methods by divers for coral fish resources and use of low-flying aircrafts and satellite passes for assessing near surface fish aggregations can lead to unbiased stock estimates. There is also an observed lack of proficiency in fishery analysts in the area of quantitative techniques as well as in the principles of fisheries. With the evolution of techniques, the probability of significant misinterpretation of data, has increased.

Very little and many of the time too late actions are implemented for conservation of fishable stock. It is therefore imperative for a worthwhile fishery management action to take into account a wide spectrum of variables, including biological indicators that are ecologically sound like spawning biomass per recruit. Thus, there is a critical need for retrospective analysis of major fisheries with a long history of data and with significant changes in the production. Through evaluation of the success and failure, one can better understand processes in harvested fishery resources as well as plan appropriate management strategies.

There is a craze to use the mathematical models for predicting the fisheries. The greatest danger in using inter-active graphics models lies in not quantifying them adequately. Mathematical models are developed for specific purposes and involve many assumptions. Unless the degree of confidence and uncertainty in a particular model is fully

understood, the application could have disastrous effects.

An interesting and thought tickling document.

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