

PROSPECTS OF TRADITIONAL KNOWLEDGE IN FISHERIES MANAGEMENT

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ABSTRACT

This review focuses on the value and policy implications of traditional ecological knowledge of fishers for restoration and conservation of fish habitats. Efforts to control floodwaters have resulted into the modification of waterscape and the alteration of wetland habitats. However, the main cheap source of animal protein in Nigeria is fish. The review identified some traditional fisheries' knowledge relevant to restoring of degraded fisheries resources. The information available shows that traditional ecological knowledge held by fishers is virtually relevant to hydrology of small lakes, habitat preferences of fish, role of aquatic vegetation as habitat components, and impacts of habitat disturbances due to human interventions in aquatic ecosystems. As pragmatic solutions to habitat degradation problems, many of these locally-evolved practices and approaches are cost-effective, environmentally friendly and culturally acceptable. The work argues for a holistic approach to fish habitat management that ensures multi-level cooperation involving fishers, government agencies, and build up on the knowledge and credibility of resource users.

Keywords: Fish, Ecology, Traditional, Knowledge, and Management

INTRODUCTION

Nigeria is a coastal state with a lot of fishery resources both in marine and inland waters (Federal Department of Fisheries: FDF, 2010) capable of producing over 980,000 metric tons of fish annually (FDF, 2013). Nigerians depend on fish as the main source of animal protein and fish has become a major substitute to beef (Ogbe and Odiba, 1996). In Nigeria artisanal fisheries employ over 500,000 people who are engaged in direct fish production (Welcomme, 2002 and WFC, 2003). Artisanal fishery is a major contributor to the national economy through the generation of foreign exchange, licensing fees (SOFIA, 2018), employment (FDF, 2007), health improvement through hobby relaxation for some people and provide a valuable supply of animal protein to the increasing population. The economic importance of artisanal fisheries is invaluable; jobs that result from associated activities such as boat building, engine maintenance, ice production and manufacture of fishing gear (UNESCO, 2010 and Ugenyi, 2004) is massive. Fisheries resources are on the decline in Nigeria due to over exploitation and inadequate management of her coastal waters. For sustainability of these resources, an adequate traditional knowledge of fisheries status (species composition, diversity and relative abundance) of her water bodies must be understood vigorously (Lawson and Olusanya, 2010). The knowledge held by local fishers who traditionally engage in fishing for commercial, livelihoods and subsistence purposes can be viewed as a useful tool for managers trying to manage fisheries in a sustainable way (UNESCO, 2010).

Fisheries laws, edict and regulations by various legislations at Federal, State and or Local government level in Nigeria are to encourage responsible fisheries management approaches as intervention. This is to improve; the utilization of fisheries resources at sustainable level, the livelihood of fishing communities, food security and the conservation of aquatic resources. Some of the edicts and regulations comprise; power to lease water, licensing to fish, registration of fishermen and gears, permits to fish with certified standard gear, prohibitions on use of explosives and chemicals, prohibitions on use of certain net, cage, traps, fixed engines except in private water body, power to arrest, power for penalties, protection against mass removal of certain fish species, power on exposure, sale and marketing of fish, prohibition on use of barriers.

Like many parts of Nigeria, artisanal fishermen, subsistence fishers, fish vendors, law makers, and fisheries managers in northern Nigeria are disturbed about the sustainability of fisheries under current

fisheries management strategies (Ladu and Okaeme, 2000 and Reed *et al.*, 1967). It is believed that the responsible agencies (Federal Department of Fisheries under the Federal Ministry of Agriculture) have very little access to the management information most crucial for the fisheries management. The fishermen of Nigeria are likely to be a repository of the traditional ecological knowledge helpful for fisheries management (ISU, 2012). Some of the traditional thoughts and ideas related to key issues in management of freshwater and fish habitats in general are outlined.

This paper titled “prospect of traditional knowledge in fisheries management” was meant to highlight fishermen’s traditional knowledge relevant to restoring degraded floodplain fish habitats, the role of fishermen’s traditional knowledge in management with mean to restore degraded floodplain fisheries, as well as the policy implications of fishermen’s traditional knowledge in conservation and management of aquatic ecosystem.

FRESHWATER AND FISH HABITAT

Management issues of Inland freshwaters comprise one of the major types of aquatic habitats. A freshwater habitat is important for various reasons; its supports human life in many ways; irrigation, transportation, and drinking water are provided. Furthermore, it is rich in aquatic life and 25% of faunal biodiversity occurs in inland freshwater systems covering an area of less than 1% of the earth surface (Mitland and Morgan, 1997). Inland waters also have the cheapest source of protein, and millions of people throughout the world maintain their livelihood depending on capture fisheries (Dan-Kishiya, 2018 and FAO, 2002). Despite their importance, freshwater habitats are seen as being prone to unprecedented levels of human and natural disturbance (Jackson and Marmulla 2001; Moyley and Sato 1994). Many aquatic habitats of the world, especially in the developing countries like Nigeria, are now highly degraded and incapable of maintaining ecological functions (Ali and Ahmed, 2001). Habitat degradation has been identified as the major cause that results from malfunctioning of ecosystem processes, and half of the species losses directly related to the degradation of habitat (Primack, 2002).

IMPORTANCE OF FISHERMEN’S TRADITIONAL KNOWLEDGE

In recent years, there has been a growing awareness that the conventional approach to managing fisheries is insufficient. It is being recognized that sustainable use of the world's living aquatic resources can only be achieved if both the impacts of the ecosystem on the living resources and the impacts of the fishing on the ecosystem are openly identified and, as far as possible, understood (FAO, 2002). It is also being formally acknowledged that fishers are an integral part of the ecosystem and that their knowledge must be acknowledged to achieve wellbeing of both ecosystem and human (Neis *et al.*, 1996).

In the socio-economic context, fishermen knowledge is seen in all steps of fish production, harvesting, handling or processing, marketing and consumption (FAO, 2002). Similarly, in the ecological context, fishers have diversified knowledge about fisheries resources such as fish habitat, bottom features, water current, nature and scales of fish aggregation and abundance and conservation of biodiversity (Bergmann *et al.*, 2004), location of breeding ground and migration and feeding and breeding biology of riverine fish (Pandey, 2003).

THE NATURE OF TRADITIONAL KNOWLEDGE

Traditional Knowledge: A cumulative body of knowledge, practice, and belief, evolving by adaptive processes; it is handed down through generations by cultural transmission. It is about the relationship of living beings (including humans) with one another and with their environment. It is also mentioned that traditional ecological knowledge is both cumulative and dynamic, building on experience and adapting to changes. It deals with indigenous ways of acquiring knowledge and this will help to eliminate defects of the incessant development approaches and it provides supports towards political and economic gain of the local people CNRS (2005).

Local Knowledge: Recent practical knowledge with short history can simply be called local knowledge. Such knowledge does not have multigenerational records.

Indigenous Knowledge: Traditional or local knowledge held by an indigenous group which is unique to a given culture or society.

Table 2.1 Common differences between local indigenous knowledge and scientific knowledge

Factors	Local Indigenous Knowledge	Scientific Knowledge
Relationship	Subordinate	Dominant
Communication	Oral, storytelling, singing, and dancing	Literate
Principal mode of thinking	Intuitive and Holistic mind and matter considered together	Analytical
Instruction	Learn through observations (Adaptive learning)	Adaptive learning usually absent
Effectiveness	Slow and inconclusive	Fast and conclusive
Data generation	Based on personal observation, as well as trial and error	Based on experimentation
Data type	Qualitative	Quantitative
Explanation	Spiritual and moral	Hypotheses, theories, and laws are use
Biological classification	Ecological	Genetic and hierarchical
Nature	Viewed as subject	Viewed as object
Situation	Local context	Institution based
Transmission	Oral, or cultural means of communication, and multigenerational	Limited to one-generation through one way using powerful media

STATUS OF FISHERIES MANAGEMENT IN NIGERIA

Traditionally, the fisheries happen to be an open access property (CNRS, 2005). As a result, indiscriminate use of gears and overexploitation has been common in the various fishing areas. Overexploitation has greatly reduced the fish production of the water bodies (FAO, 2007). This is also augmented by siltation the habitat degradation in the migratory paths, as well as conversion of bed into agricultural lands. Both of the causes have led to the depletion of the resource.

Relevance of fishermen knowledge in managing fisheries resources

1. Management of fish habitats alone in isolation might not be a good way of habitat conservation.
2. Fisheries managers believe that it is vital to establish the rights of community fishers to have access to the fisheries. If their rights could not be established, it will not be possible to bring fishers into modern management systems and the valuable indigenous knowledge will be eroded or lost.
3. Communities, especially traditional fishers, can help fisheries management in a number of ways. They can suggest which mesh size will be appropriate for conserving some key fish species. They can help to identify the proper time and place for implementing fish rules. They can help provide information on extirpation (local extinction) of fish and the process to restore them.
4. The value of the community people in fisheries management could be acknowledged properly at the policy level if fisheries managers need to ensure good management by the participation of fishers.
5. Many fisheries managers and scientists believe that fishermen knowledge, in various respects, is more valuable than conventional scientific knowledge, so, their knowledge would be well documented and would be conserved and disseminated.
6. Fisheries development, fisheries managers must explore what knowledge fishers already have to restore and develop a particular resource.

CONCLUSION

This review work detailed the concepts of fisheries management and relevance of fishermen knowledge in managing fisheries resources. The rich indigenous knowledge of local fishers related to fish behaviour

and fish habitats, as well as their implications to fisheries policy indicates that, scientific knowledge alone is not adequate to resolve the problems of the floodplain fisheries. In this context, the knowledge, related to fish habitat management was converse and significance of traditional knowledge of ecology to fisheries management and conservation of aquatic habitat was discussed.

RECOMMENDATIONS

- Knowledge of fishermen should be well documented, conserved and disseminated.
- Fisheries managers should explore what knowledge fishers already have to restore and develop a particular resource.
- Research on this topic should be adhered to in Katsina state so as to aid policy makers of the state on fisheries matters

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