

# Valuing Africa's inland fisheries: overview of current methodologies with an emphasis on livelihood analysis

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## Abstract

While Africa's inland fisheries are widely recognized to be of great importance to local people, accurate and up-to-date information on their value is sparse and its absence is a serious constraint to the formulation of effective fisheries policies and management practices. As a contribution to current efforts to address this constraint, this paper reviews the different methods that are potentially applicable to the valuation of inland fisheries and discusses their respective rationales and limitations within a multi-sectoral, multi-user context. The livelihood analysis approach is given special emphasis. The complementarity of this recently developed approach with the other, more conventional, environmental economics methods is illustrated.

## Introduction

It is widely perceived that Africa's inland fisheries play an important role in many rural economies. However, as efforts have increased to build upon this awareness and improve the management of these resources, it has become very clear that in most parts of the continent (as in Latin America and Asia) accurate and up-to-date assessments of the economic value of small-scale fisheries are lacking (LARS2 2003; Neiland 2003). Similarly, recent assessments of the potential role of small-scale fishing activities in economic development (both at the local and national levels) also systematically highlight how poorly the true socio-economic value of this sector is reflected in official statistics and discussions on food security and livelihoods (European Commission 2000; Kaczynski and Looney 2000; Anon. 2001). Faced with this lack of information, national policy-makers and planners, as well as international development agencies, are severely constrained in their ability to propose appropriate rural development policies.

Methods do exist, however, that can help evaluate more precisely the economic and social value of inland fisheries and aquatic resources. The purpose of this article is to review the different valuation methods and to discuss their respective rationales and limitations. The Livelihood

Analysis (LA) method will be given particular attention in this review because of its promising usefulness in the specific multi-use/multi-user context characterizing inland aquatic resources. In particular, the article will underline the rationale for using LA and also highlight how it complements more classic, economic and socio-economic valuation methods.

## Valuation of fishing activities

Economic valuation in fisheries can be approached in a number of different but complementary ways. Three broad approaches to estimating economic value have been developed and are now widely used: (i) conventional economic valuation; (ii) economic impact analysis; and (iii) socio-economic analysis.

## Conventional economic valuation

**Economic efficiency analysis.** The arithmetic of conventional economic valuation is underpinned by economic efficiency analysis (EEA) that has as its goal the maximization of social welfare (defined in terms of the optimal allocation of resources). There are two ways in which EEA is commonly applied: cost-effectiveness analysis and cost-benefit analysis. With cost-effectiveness analysis there is a presumption that the least-cost option will achieve a given

objective; whereas with cost-benefit analysis the presumption is in favor of the option that produces the highest ratio of monetary benefits to costs. In short, there is an implicit value judgment underlying EEA, i.e., that improvements in economic efficiency are desirable. In a policy-planning context, this assumption of efficiency is the basis of a number of decision criteria that can be used to select and prioritize project options (or other interventions) in terms of their economic value to society.

**Total economic value.** It is now recognized that a natural resource may provide a range of benefits according to the particular use or function it fulfils, and this forms the basis of the concept of total economic value (TEV). The components of TEV in respect of an aquatic resource, such as a river system and its adjacent floodplains, are shown in Fig.1. The obvious and tangible benefits would be those derived from *direct use* of the resource, and these may materialize in the form of commodities (e.g., fish, aquatic plants, fuel-wood) or services (e.g., recreation and amenity). The aquatic resource may have an additional *indirect use*, such as coastal protection and providing a habitat for juvenile fish. Individuals may derive a benefit from being able to postpone their personal use of the resource to a later date; they attach an optional value to using the resource. Finally, there is

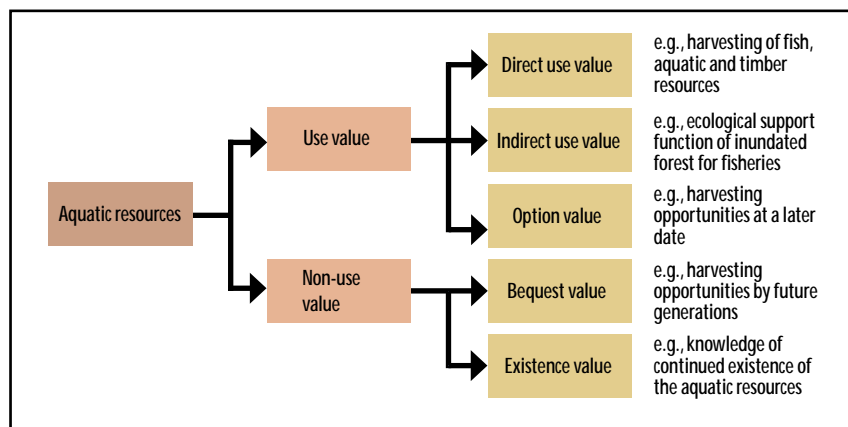


Fig. 1. Components of the total economic value (TEV) of an aquatic resource, such as a river system and its adjacent wetlands

also another set of benefits that are quite distinct, termed *non-use* (or “passive” use value). This might include the value associated with the desire to maintain a river fishery intact for future generations (bequest value) or simply the satisfaction of knowing that a particular aquatic habitat has been preserved in perpetuity (existence value).

### Economic impact analysis

In contrast to the EEA described above, economic impact analysis (EclA) does not set out to determine whether a particular policy intervention or project is either beneficial or detrimental in terms of its economic value to society. While EclA will consider the level of benefits generated by an intervention, it does not consider costs of implementation (i.e., there is no benefit-cost framework). Instead, EclA aims to establish what effects a particular policy intervention or project has on specific variables. This might involve using *revenue analysis* to see whether a new fisheries management system is likely to raise fishers’ gross earnings or revenue. More ambitiously, EclA might also involve the application of *multiplier analysis* to measure the total economic activity generated by a new fisheries management system (e.g., output, income or employment) as a consequence of the interdependence between fishing and the other sectors comprising the regional economy. The total economic impact will be made up of direct and secondary (i.e., indirect and induced) effects.

### Socio-economic analysis

Conventional economic valuation is concerned with the analysis of whether particular interventions or projects improve the net wealth of a society. In some cases this outcome might also involve the creation of “winners” and “losers”. For example, the building of a dam across a river for hydro-electric power involves a wide diversity of effects, including major changes in environmental quality and aquatic resource use. Conventional cost-benefit analysis sidesteps the issue by invoking the principle of “potential compensation” (i.e., the intervention represents a net gain to society if the winners could compensate the losers and still be better off). However, since this principle does not insist that compensation actually be paid, it is often of limited relevance when the losers are amongst the poorest of the poor.

In such situations (especially where there is poor governance within the weak state context), something more than economic valuation is warranted, specifically a *distributional analysis* to examine how the net costs and benefits are apportioned across different groups affected by the change. Socio-economic analyses can often provide an important starting point in identifying and characterizing the socio-economic strata in a community or region. Once the social strata are known, further in-depth economic studies (e.g., income-expenditure surveys) can provide a better understanding of benefit flows

(or the lack of them) in relation to specific policy interventions.

### Livelihood analysis

In recent years, socio-economic analysis has been further extended with the development of techniques for livelihood analysis (LA) (Carney et al. 1999). When underpinned by conceptual frameworks such as the sustainable livelihoods approach (SLA) (Scoones 1998), these techniques can help to provide a better understanding of the relationship between human society and natural resources.

### Rational for adopting livelihood analysis

Intrinsically, economic valuation techniques do not permit identification of the factors that influence or affect people’s access to resources. However, very often the key issue is not the availability of the resource (or symmetrically its scarcity, to which its economic or even social value is related), but the access to this resource. Extending Sen’s (1981) main conclusion, which was initially framed in the specific context of famine, to the wider domain of natural resources, an increasing number of empirical studies have clearly demonstrated that poor people in rural areas are usually those who lack access to natural resources, e.g., forests, fishing grounds, grasslands, etc. (Kremer 1994 ; Devereux 1996 ; Leach et al. 1999). In the specific context of fisheries, Béné (2003) shows how socio-institutional mechanisms governing people’s access to fisheries resources, rather than the resources themselves, play a critical role in vulnerability to poverty.

The main lesson pointed out by these different empirical studies is that determining the economic value of a natural resource becomes irrelevant if people whose livelihoods depend on these natural resources cannot access them. Therefore, a key question is: what are the factors (including policies) that influence people’s access to, and control over, natural resources?

The conceptual framework provided by LA appears to be particularly useful to address this question. Indeed, the real

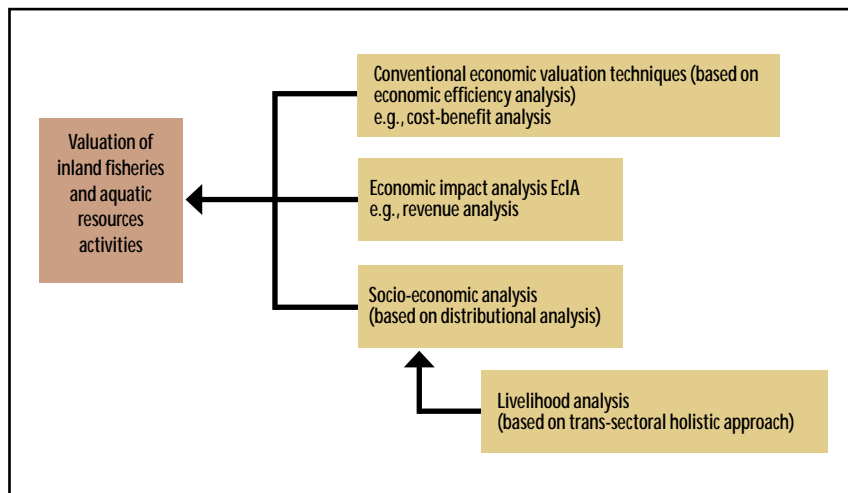


Fig. 2. Valuation techniques for aquatic resources within a multi-use context

benefit of such a framework is that it encourages analysts to take a broader and more systematic view of the factors that affect people's livelihoods – whether these are shocks and adverse trends, poorly functioning institutions and policies, or a lack of assets – and to investigate the relations between them (Scoones 1998).

### Livelihood analysis in practice

The multi-use nature of the water upon which households rely for their inland fishing activities, and the multi-user context within which those activities take place, introduce a number of important methodological constraints. In particular, the intricacy of activities characterizing the livelihood strategies of the majority of fishing households implies that mono-sectoral approaches focusing on separate activities (e.g., fisheries or agriculture) are not appropriate. To correctly implement these valuation exercises, integrated (holistic) assessment analyses in which the different sectors of the local economy are viewed together as a joint production activity should be adopted.

The survey techniques and methods required for these trans-sectoral socio-economic valuations already exist. For many years they have been tested and applied in other domains (e.g., agro-pastoral and agro-forestry systems) and their respective methodological and analytical strengths and weaknesses are well known and documented (DFID 1998). Usually a

combination of participatory and non-participatory (passive) techniques is required. There is no unique “recipe” or best methodological combination. The only central condition is that the techniques must be trans-sectoral and holistic. They are, therefore, usually designed and implemented by multi-disciplinary teams. Table 1 presents some of them.

### Conclusion

Adequate policies and processes for the effective management of natural resources require information about the exact economic value of these resources, and also about the ways in which people use these natural resources to sustain their livelihoods. It could be argued that to make an appropriate decision regarding the management of a natural resource, not only must information about its economic value be known but also the contribution that this resource makes to people's livelihoods: who uses the resources, when, and how?

A variety of techniques exist to answer these questions. It has been shown that the different approaches offer a set of complementary techniques that constitute a comprehensive analytical framework (Fig.2). This analytical framework, when properly applied, can help to improve understanding of the contribution of inland fisheries to national economic development and to the livelihoods of local populations.

As a final point, this article argues that the generation of more information on the economic and/or social values of small-scale fisheries is not in itself a sufficient condition to support more appropriate agenda-setting or to ensure the implementation of successful policies. Experience shows that the impact of social/economic information generated through a better evaluation process is not merely determined by the quality of that information, but also to a large extent, by the nature and quality of the policy environment. Better evaluation is nothing without improved governance, including political will and adequate policy processes.

### References

Anon. 2001. Report of the Seminar on Contribution of Fisheries to Poverty Reduction in West Africa. Facilitated by the Sustainable Fisheries Livelihoods Program in West Africa, 14-15 February 2001, Dakar.

Béné, C. 2003. When fishery rhymes with poverty, a first step beyond the old paradigm on poverty in small-scale fisheries. *World Development* 31(6): 949-975.

Carney, D., M. Drinkwater, T. Rusinow, K. Neeffjes, S. Wanmali and N. Singh. 1999. Livelihoods approaches compared – a brief comparison of the livelihoods approaches of the UK DFID, CARE, Oxfam, and the UNDP. Department for International Development, London, 19 p.

Devereux, S. 1996. Fuzzy entitlements and common property resources: struggles over rights to communal land in Namibia. IDS Working paper 44. Brighton Institute of Development Studies, University of Sussex.

DFID. 1998. Socio-economic methodologies - Best practice guidelines. Department for International Development, London, published by the Natural Resources Institute.

European Commission. 2000. Communication from the Commission to the Council and the European Parliament. Fisheries and Poverty Reduction. COM (2000) 724 final. Commission of the European Communities, Brussels, 20 p.

Kaczynski, V. M. and S.W. Looney. 2000.

Coastal resources as an engine of economic growth and reduction of poverty in West Africa: Policy considerations. *Coastal Management* 28:235-248.

Kremer, A. 1994. Equity in the fishery: a floodplain in N.E. Bangladesh. Project Report No. R94E, Centre for Development Studies, University of Bath, UK.

LARS2. 2003. Statement and recommended actions. The Second International Symposium on the Management of Large Rivers for Fisheries – Sustaining Livelihoods and Biodiversity in the New Millennium. Mekong River Commission and Food and Agriculture Organization, Phnom Penh, 11-14 February 2003.

Leach, M., R. Mearns and I. Scoones. 1999. Environmental entitlements: dynamics and institutions in community-based natural resource management. *World Development* 27(2):225-247.

Neiland, A. (ed.). 2003. Valuation of tropical river fisheries: A global review. Report for the WorldFish Center, Penang, Malaysia.

Scoones, I. 1998. Sustainable rural livelihoods: a framework for analysis. IDS Working paper 72, Brighton Institute of Development Studies, University of Sussex.

Sen, A. 1981. Poverty and famines: an essay on entitlement and deprivation Clarendon Press, Oxford.

Table 1. Socio-economic technique suitable for livelihood analysis of fisheries

| Type of analysis / assessment   | Data collection techniques  |
|---|---|
| <ul style="list-style-type: none"> <li>Poverty profile</li> <li>Wealth ranking</li> <li>Income-expenditure survey</li> <li>Food security assessment</li> </ul>  | <ul style="list-style-type: none"> <li>Participatory / Consultative / Passive</li> </ul>  |
| <ul style="list-style-type: none"> <li>Institutional analysis</li> <li>Stakeholder analysis</li> <li>Conflicts analysis</li> <li>Ethnic analysis</li> <li>Gender analysis</li> <li>Natural resource accessibility analysis</li> </ul> | <ul style="list-style-type: none"> <li>Verbal / Visual / Analytic</li> <li>Quantitative / Semi-quantitative / Qualitative</li> <li>Rapid Appraisal / In-depth survey</li> </ul> |
| <ul style="list-style-type: none"> <li>Multi-sectoral activity analysis</li> <li>Household survey</li> <li>Activity ranking</li> <li>Seasonal calendar</li> <li>Oral histories</li> </ul>   | <ul style="list-style-type: none"> <li>Case study / Large-scale survey</li> </ul>   |

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