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Review Article

The state of inland fisheries in Ethiopia: a synopsis with updated estimates of potential yield

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ABSTRACT

This study reviews fisheries and management practices and provides estimates of the present and potential fish yield of Ethiopian inland fisheries. Published and unpublished sources were used, 28 years of fisheries data were analyzed and empirical models were applied to estimate potential yield. Ethiopian waters hold about 180 fish species, some freshwater shrimps and crabs, commercially important microalgae and a diverse vegetation, all together of great economic and socio-cultural values. Fisheries provide economic support directly and indirectly to about half a million people and serve as source of affordable protein for many households. Our estimate of potential yield (94,500 t yr^{-1} + 5.2% distributed as 73,100 t yr^{-1} + 3.3% for lentic and about 21,400 t yr^{-1} + 11.9% for lotic ecosystems) is far above the current yield levels, suggesting substantial scope for fisheries expansion. Nevertheless, some lakes already show signs of overfishing of target species, while others appear to have growing or stable fisheries. As yet, no ornamental fishery occurs in the country and the potential of indigenous fish species for ornamental fish trade needs to be evaluated. Management follows the traditional command and control approach and it seems that there is a general lack of awareness and scientific information on the fisheries. Major challenges of the fisheries are high post-harvest loss, lack of stringent sanitary and phytosanitary standards for assuring good quality products, and overfishing of valuable fish species in some lakes. Thus, continuous fisheries monitoring and yield assessment are urgently needed as is research directed toward unexploited water bodies and species.

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1. Introduction

Ethiopia is an agrarian country where agriculture remains the dominant sector of the economy, contributing about 43% of the GDP, 85% of employment and 90% of total export earnings, as well as providing about 70% of the raw materials for the industrial sector (Demese et al., 2010). However, the country has been food insecure for more than three decades despite its great potential for expanding agricultural production and productivity. Persistent droughts, inappropriate agricultural policies, low and inappropriate technologies, pre- and post-harvest losses, poor and inadequate infrastructure, limited skilled manpower and limited credit opportunities are the main reasons for this poor state of affairs (Mulat et al., 2004). Agriculture in Ethiopia is considered here in its broadest definition to include crops, livestock, fisheries, forestry and natural resource management. The country is well endowed with enormous cultivable land, livestock and fishery resources, which are largely untapped yet could boost the economy and improve the livelihoods of the rural people that depend on agriculture. The Ministry of Agriculture (MoA) thus considers the fishery subsector as one of the potential intervention areas to achieve the objective of enhancing food security, employment and provide alternative sources of income to improve the livelihoods of rural people in a sustainable manner.

Ethiopia has been a landlocked country since 1993, so its fishery comes exclusively from inland water bodies including lakes, rivers, streams, reservoirs and substantial wetlands that are of great socio-economic, ecological and scientific importance. Fishing has been the main source of protein supply for many Ethiopians particularly for those who are residing in the vicinity of major water bodies like rivers in the Gambella region, Rift Valley lakes and Lake Tana. Modern fishing techniques were introduced in the 1980s and 1990s, with fisheries development programs by the Ethiopian Orthodox church and later by the Lake Fisheries Development Project financed by EEC (the present EU).

Research on the aquatic resources started in the early 20th century (Boulenger, 1904) and was mostly done through short expeditions by European travelers and short-term residents. Ethiopian scientists became increasingly involved after the 1970s (Shibru, 1973; Getachew, 1980; Shibru and Fisha, 1981). Studies were focused on the description of the water bodies, limnological features of lakes and reservoirs (Amha and Wood, 1982; Kassahun and Amha, 1984; Melaku et al., 1988; Wood and Talling, 1988; Seyoum et al., 1991; Kebede et al., 1994; Tudorancea et al., 1999; Tudorancea and Taylor, 2002; Zinabu, 2002; Brook, 2003; Adamneh et al., 2008), the biology of few fish species (Getachew, 1987; Eyualem and Getachew, 1992; Zenebe, 1999; Wudneh, 1998; Demeke and Elias, 1997; Gashaw and Zenebe, 2008), fish diversity and ecology (Shibru, 1973; Shibru and Fisha, 1981; Abebe and Stiassny, 1998; Eshete, 2003; Golubtsov and Mina, 2003; Golubtsov et al., 2004; Golubtsov and Darkov, 2008; Golubtsov and Redeat, 2010) and preliminary estimates of fish production potentials (Mebrat, 1993; Breuil, 1995; FAO, 2003).

Most of the information in the literature on the fish production potential of the country is not consistent, however, and in parts even contradictory. Most of the estimates did not include the potential of small water bodies and in some cases even the rivers were not considered. However, small water bodies are important for a number of reasons, and deserve more attention from fishery planners and developers as they are relatively easy to manage and could be a potential source of protein and employment in places where both are in short supply (Haight, 1990 as cited by Marshall and Maes, 1994). They can also be easily integrated with other agricultural activities without incurring significant additional costs and even improving the overall farm activities.

In this review, we thus try to give a more complete picture considering all water bodies, and also including the newly constructed reservoirs for irrigation development and hydropower generation. Moreover, it is still difficult to find comprehensive information about the state of the fishery and management practices in Ethiopia. Thus, the main purpose of this study is to review the dispersed information on the state of the fishery and its resources, the potential of fish production, and the present value and management practices of the inland fisheries. The second purpose is to examine the major challenges for fisheries development. The study concludes with suggested options for effective and sustainable management.