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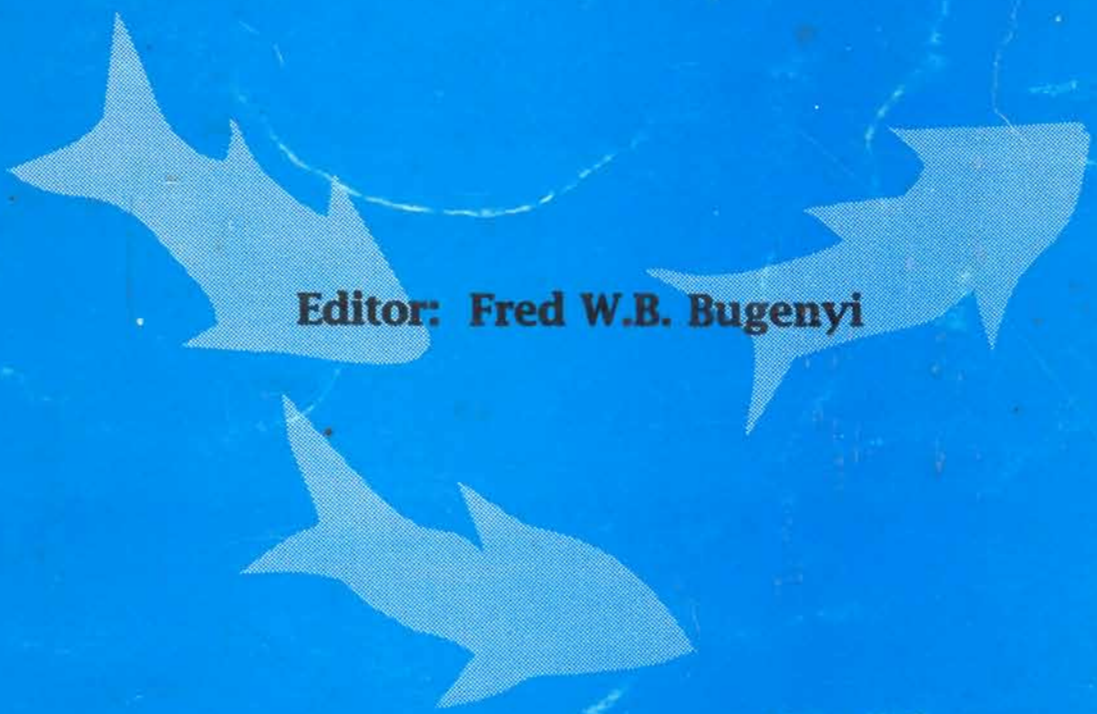

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Methodology for valuing Wetlands in Uganda

**BENNO LUTHIGER*
Fisheries Research Institute (FIRI)
P.O.Box 343 Jinja, Uganda.

**Bachmattstr. 39, CH-8048 Zürich, SWITZERLAND*

INTRODUCTION

The wetlands in Uganda are undergoing rapid degradation. Swamps provide a habitat for birds, fishes and other animals. They have many ecological functions and, furthermore, supply people with multiple resources, such as reeds, herbs, fish and agricultural products. Although some uses of wetland are sustainable, others lead to rapid deterioration. The main threat to swamps are human activities. One reason for the progressive destruction of wetlands is that the people may not appreciate the existence of and the treasures represented by wetlands even if they live in arm long distance from them. Another reason is that the two most important user groups of wetlands, farmers and fishermen, although having conflicting interests concerning the wetlands, hardly interact.

A study, done as part of the Ecotone Project at the Fisheries Research Institute (FIRI), tries to evaluate in monetary terms how much Uganda loses with progressive destruction of wetlands. The study looks first at which uses of the wetlands are of importance and thereafter it examines, what data is needed and available to calculate the values of those uses.

METHODOLOGY

The methods used in the study assess the value of wetlands through cost- benefit analysis. This consists of adding up the various benefits coming from sustainable uses of wetlands and comparing them with possible profits from converted wetlands. The sustainable benefits a wetland provides are: erosion and flood control, water purification and wildlife habitat. Furthermore, wetlands can attract tourism and provide goods like medicinal herbs and raw materials for craftmakers. Uses which alter a wetland are agriculture and waste disposal.

This research concentrates on the non- sustainable agricultural use of the wetland area on the one side and on the filtering capacity, the existence value and the importance of the swamps as breeding place for fishes on the other side.

The profit P of wetland area used for cultivation is easy to assess. Shortly after clearing a swamp the area seems to be slightly more productive than further inland. The yield y per area on dryland soil is well known for various crops. The profit, therefore, can be calculated by multiplying the yield with the prices of the crop and subtracting the costs C which go into producing this yield. The production costs consist mainly of wages. Hence:

$$P = y \times p - C$$

The value of the filtering capacity of the wetland can be assessed by comparing the filtering capacity of a natural wetland with an appropriate wastewater treatment facility, e.g. waste stabilisation ponds. By discounting both the operation costs and the depreciation of such waste stabilisation ponds, we can attribute a value to this facility. If a wetland does the same to the wastewater, therefore, we can attribute the same value to the wetland too. However, this value is optional. That means this value can be realised by passing wastewater through the swamp. By doing that the costs of constructing and maintaining a wastewater treatment facility can be saved. If there is no wastewater passed through the wetland, this special value is not realised but still remains an option. By destroying a wetland this value is lost.

The concept of the existence value has been developed in industrialised countries where nature in all its aspects (wildlife, plants, scenery) are presently rare. Existence values refer to the fact that individuals attach value to goods only by

knowing that such goods (e.g. rare and diverse species, unique natural environments etc.) exist, even if the individuals do not intend to make an active use of these goods. Such goods are usually public goods which means that no one can be excluded to use them. Therefore, no market can be established for such goods and by that no price can be attributed to them. Although they have a value, traditional cost-benefit analysis could not handle them because such calculations have been biased.

The concept of the existence value provides a possibility to make the economic analysis accessible for public goods. The method to estimate existence values involves willingness to pay (WTP) studies. A possible form of such a study is to ask people directly what amount of money they would pay to support a policy which protects wetlands. WTP studies, therefore, reflect the people's perception of the value of wetlands. WTP studies have proved appropriate for the calculation of existence values in industrialised countries (PORTNEY, 1994). In developing countries they have been found practicable for estimating the cost recovery capacity of large public sponsored investments (e.g. water and sanitation). It is an open question, therefore, whether WTP studies are suitable for the estimation existence values in developing countries.

In the present situation in Uganda it is most likely that the greatest importance of wetlands in monetary terms comes from their contribution as breeding places and refuge for fishes. The value V of a wetland can be described as a product of the marginal productivity of the function of fish harvest Q(H,W) and the dockside price p of the fishes, hence:

$$V = q_w Q(H,W)*p$$

The harvest function Q(H,W) is dependent both on the human effort H needed to catch the fish and the wetland acreage W (COSTANZA et al., 1989). LYNNE et al. (1981) developed a model of catch in which catch depends on swamp acreage, catch in the former year and effort:

$$Q_t = b_o + b_1 \ln W_{t-1} * H_t + b_2 \ln W_{t-1} * H_t^2 + b_3 Q_{t-1} + e_t$$

To estimate the parameters $ß_0$, $ß_1$, $ß_2$ and $ß_3$, we need statistical data about human effort H (measured in days or canoes) and covered wetland area, which both contribute to the harvest Q. Once the parameters are estimated, the marginal productivity can be estimated. Hence,

$$q_w Q = (b_1 + b_2 * H) * \frac{H}{W}$$

With appropriate statistical data about fish catches, therefore, a simple model of a harvest function can be calculated and by that a value of the wetlands can be estimated.

CONCLUSIONS

The research described here is an attempt to evaluate the contribution of some of the various functions of a wetland to its overall value. It furthermore takes into consideration that the benefits of wetland protection are mainly social benefits whereas the profits of non-sustainable used wetland area can be privatised. By that, the study may provide some hints concerning the rationale behind the progressive wetland degradation. However, the analysis is purely economic and, therefore, excludes the intangible value wetlands have for society.

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