
ECONOMIC VALUATION OF ENVIRONMENT WITH REFERENCE TO LOKTAK LAKE

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ABSTRACT

One of the most important concern in the new millennium is how proper synchronization is to be maintained between environment protection and sustainable development. And economic evaluation of the environment is considered being one very important component in this direction. Manipur is not an exception to this trend. It is here that the issue of Loktak Lake came to the forefront. This freshwater lake, which is one of the important wetlands of South Asia and a Ramsar site, is the source of vast ecological and economic benefits, providing livelihood and habitat to various flora and fauna, as well as to human beings. From various angles, its importance is so much that its indispensability is felt not only to Manipur but to the world. However, in the last few years, excessive and uncontrolled exploitation has posed a serious threat to its sustainability in the near future, which would be an irreparable loss for all. The need of the hour is for a proper economic valuation of this wetland and making the stakeholders conscious of the same, which will go a long way in maintaining the economic sustainability of Loktak Lake with all its external and intrinsic values intact. The effort of the paper is to make an overall economic valuation of the Loktak Lake, taking into consideration the socio-economic and ecological aspects connected to it.

KEYWORDS: Loktak Lake, Wetland, Manipur, Economic Valuation, Sustainability.

1. INTRODUCTION

Today the world is changing rapidly towards more scientific and technological advancement and with it an increase in man's dependence on the natural environment, which demands the need for an understanding of its value. The threats to the sustainability of environmental goods and services, particularly water resources, are human threats and require intervention through human solutions. The challenge for good environmental governance is to find these solutions, decide about options and choices, align these options to the inherent values and needs of society and implement them effectively through capable institutions and relevant practices. Environmental goods and services are typically public goods, many of which are also managed under common property systems. Difficulty arises in realizing the value of these goods and services in such a way that allows them to be included in the decision-making framework to mitigate adverse effects on these resources as government actions are implemented.

This has adverse implications for the national economy and the vulnerable poor. Social welfare and livelihoods can only be sustained through a policy environment that reduces the vulnerability

of society and nature to resource-scarcity threats. This requires technical and food security interventions and interventions that offset market, policy, and institutional failures. A poor understanding of the value of environmental goods and services will continue to encourage their overuse and degradation, the poor internalization of the associated costs and benefits of their use, and sub-optimal allocation among competing users, thus further exacerbating development constraints.

One of the most important aspects in environmental economics is the valuation of environmental amenities. It is the heart of environmental economics and is emerging as a very active and rapidly expanding field. From scenic beauty and recreational opportunities to direct inputs into the production process, environmental resources provide a complex set of values to individuals and the society. There are also values that are not directly tied to use, such as climate change modulation. These benefits apply to environmental valuation, which forms an important issue in the present-day efforts toward environmental conservation. In fact, the basic purpose of economic valuation is to reveal the true costs of using scarce environmental resources for long-term economic sustainability. It is concerned with the analysis of methods for obtaining empirical estimates of environmental values. Wetlands, meaning those ecosystems that connect land and water, all over the world also come within the purview of this ongoing issue without the exception of the Loktak lake of Manipur, a prominent fresh-water lake in India's Northeast and an important Ramsar site. [1]

Proper utilization of natural resources and understanding of environmental impacts requires that several conceptual issues be weighed. These include the correct understanding of environmental cost, choice of valuation technique, setting the time horizon, assessing distributional impacts, and evaluating risk, uncertainty, and ethical considerations. Having said all these the issue is not something easy to deal with, yet a sincere effort is in need from every quarter. Thus, the attempt of the paper is to focus primarily on the role of economics, and on valuation in particular, in supporting "good" environmental governance, specifically water governance, with reference to Loktak lake of Manipur. However, before we come to the main issue surrounding economic valuation of Loktak lake, what is needed is to have a brief understanding of two aspects separately viz., environmental valuation as a subject and specific facts related to Loktak lake. [2]

ENVIRONMENTAL VALUATION

Environmental Valuation is concerned with the analysis of methods for obtaining empirical estimates of environmental values, such as the benefits of improved river water quality, or the cost of losing an area of wilderness to development. It is the process of putting monetary values on environmental goods and services (EG&S), many of which have no easily observed market prices (Dixon, 2008). In simple words, economic valuation in the environment context is about measuring the preferences/choices of people for an environmental benefit or against environmental degradation. Valuation is therefore in relation to preferences held by people and is almost human-centric. Here, one very important concept closely associated with environmental valuation that needs to be supplemented is the Total Economic Value (TEV). In environmental economics, it is taken as an aggregation of the main function based values provided by an ecosystem (Lambert, 2019). This includes use and non-use values.

Use Value:

- Direct: Got through a removable product in nature (i.e. Timber, Fish, Water).
- Indirect: Obtained through a non-removable product in nature (i.e. Sunset, Waterfall).
- Option Value: in which an individual derives benefits from ensuring that a resource will be available for future use.

Non-Use Value:

- Value placed on a resource that will never be used. Under it comes into existence value and bequest value. It is derived from the knowledge that a resource is maintained.

Need for Valuation

In the modern day context where the indispensability of environment is very much felt, there arises the need for a valuation of the same as to estimate the diverse values that it provides, be it pristine or human-made. A proper valuation could indeed help in understanding the contribution that ecosystems make to society. Over and above, with the ever-increasing concern for sustainability of environment, the practice of environmental valuation plays a prominent role in its policy design. The need for economic valuation of environmental impacts and assets arises for pursuing efficient policies and investing in efficient projects and programmes. [3]

Methods of Valuation

Now the important question is how this valuation in the context of environment is to be carried out. There have been significant improvements over the past four decades in our ability to estimate the economic value of environmental amenities and disamenities. In this concern, various evaluation methods or techniques have been suggested by experts in this field. Among various valuation techniques identified, the followings are the most frequently used valuation methods according to experts (Sakuyama et al., 2006):

- Market Price Method: Estimates the economic value of commercially traded products and services from an ecosystem based on their market prices. For example, direct use values, especially wetland products like fish, water, etc.
- Replacement Cost Method: Estimates the value of a non-market services based on the cost of substitution. This involves three steps: estimate level of service provided, identify least cost alternative, and establish public demand for this alternative. For example, Indirect Use Values like coastal protection, avoided erosion, pollution control, water retention, etc.
- Travel Cost Method: Used to estimate the value of recreational benefits generated by an ecosystem. Assumes that the value of a site is reflected in how many people will pay to get there. Example, recreation and tourism.
- Hedonic Pricing Method: Hedonic techniques assume that the price paid for a commodity is directly related to the supply of the commodity's attributes. Most common is the property value approach, which uses variations in property values to reveal implicit values and demand for environmental amenities. The hedonic property value approach measures the welfare effects of changes in environmental goods or services by estimating the influence of environmental attributes on the value (or price) of properties. This method is used when a wetland values influence the price of marketed goods. Clean air, large surface of water or aesthetic views will increase the price of houses or land.
- Contingent Valuation Method: The only available technique for estimating non-use values. This method uses interview techniques to ask individuals to place values on environmental goods and services. Questions are posed to individuals directly about their willingness to pay (WTP) or willingness to accept (WTA) payment.

All these methods are not foolproof as well as not free from limitations, and ultimately leave it to the better judgment and ability of the experts involved, who again are dictated by time and space.

FEATURES OF LOKTAK LAKE

Loktak lake, lying between 24°25'N to 24°25'N latitude and 93°46'E to 93°55'E longitude, is in

Bishnupur district approximately 40 kilometres away from Imphal, the capital of Manipur (Kumari, 2018). The lake, as already mentioned, is a wetland ecosystem providing many services that contribute to human well-being and poverty alleviation. Loktak has got immense socio-economic and cultural significance and also provides hydrological and ecological services, and is considered as the lifeline of Manipur. The main water volume of the lake comes specifically from the Manipur River, as it is the floodplain wetland of the same. Though the actual area of the lake is about 286 sq. km, it covers a total catchment area of 4947 sq.km (Singh et al., 2010: 1747). Referred as the lifeline of the people of Manipur, it plays an important role in the ecological and economic security of the region. It was also included on a list of priority wetlands identified by the Government of India for intensive conservation and management (Ministry of Environment and Forest, Government of India, 2009:15). Indeed, the lake has got a major contribution to the overall socio-economic, cultural and ecological scenario of the state. Socio-ecological and economic features of Loktak lake:

- A large population living in and around the lake depends upon the lake resources for their sustenance.
- Fisheries from Loktak Lake form the economic base for existence of large number of households living in and around the lake. The lake is a breeding ground for a large number of riverine fishes and continues to be a vital fisheries resource. 60% of the State's fish demand, producing 1500 metric tonnes of fish annually (WISA).
- It is also habitat to many rare faunas, including migratory birds coming from as far as Siberia (116 species of birds and 32 species of mammals).
- The Lake has been the source of water for generation of hydroelectric power, irrigation and water supply.
- Source of several other products, which form the livelihood of several families living in and around the lake. The lake provides vegetables, fuel and fodder that are collected by several households, both for self-consumption and for revenue generation. Communities living on the islands and on plum huts use the lake as a transport channel.
- Primary source of livelihood and food not only for the human inhabitants but also for the birds and animals living there.
- Important site for eco-tourism and adventure sport.
- Phumdis, a heterogeneous mass of soil vegetation in organic matter which occurs in all sizes from a few centimetres to about 2.5 m, is found floating in the lake. The largest single mass of phumdis covering an area of 40 sq.km makes up Keibul Lamjao National Park, which is the only natural habitat of one of the most endangered mammal, the brow-antlered deer or Sangai (*Cervus eldi eldi*).

Despite the above benefits Excessive human exploitation of the lake without any concrete rule or consciousness of natural conservation lead to its degradation which further led to negative multiplier effects in and around the location. Negative consequences such as siltation, weed infestation, decrease in power generation, loss of biodiversity, decrease in fisheries production, high water level and flooding, pollution etc has become common happening. Lack of community involvement, encroachment pressures, absence of feasible policy and regulatory mechanisms at the government level, inadequate technical and managerial skills and coordination among different agencies concerned with Loktak management, lack of awareness about the importance of the wetland in the local, national and international context, absence of baseline data on socio-economic and ecological indicators, all combined in bringing out the above negative effects. And it is here that the discussion and awareness on economic valuation of Loktak is very much felt.

ECONOMIC VALUATION OF LOKTAK LAKE

Wetland, like Loktak lake is a fragile ecosystem and the change of one part of the system may have profound effects on the rest. It is precisely because of this multiplicity of uses and interdependencies that a complete economic analysis is imperative in order to evaluate both the benefits and the costs of the lake conservation. As already mentioned, the challenging aspect about valuation related with environment matter is that some of these goods and services are sold in markets where they have observable prices. Others are not marketed. Taking into consideration of the importance of Loktak lake various initiatives has been taken up for its sustainability and conservation while continuing the utilization of its benefits, and economic valuation became a very essential part in the whole process. One major initiative in this direction was the India-Canada Environment Facility (ICEF) supported project during 1998-2003 aimed at complete and exhaustive inventorisation of the ecological, socioeconomic and institutional features of the lake and its catchments, and identification of restoration strategies through implementation of demonstration projects which was jointly carried out by the Government of Manipur represented by Loktak Development Authority (LDA) and Wetland International South Asia (WISA). An 'Atlas of Loktak' has been published which has been used as an effective tool for management planning of the wetland by LDA in 2004. The project with a funding of US\$ 110 million was directed at lake restoration through implementation of action plans on catchment conservation, water management, biodiversity conservation, sustainable resource development and livelihoods, and institutional development. At the core of the plan is balancing water allocation for human and ecological purposes, considering water requirements for maintenance of the national park and overall lake ecology along with hydropower, irrigation and domestic uses. The Planning Commission of the Government of India, decided in September 2008 that these policies would be implemented over a period of 5-6 years at an estimated cost of over Rs. 5000 million (US\$100 million), and extended the area under management to also incorporate the water of Nambul and other rivers and their tributaries, which are primarily responsible for polluting the Loktak Lake (The Sangai Express, 22 September 2008). In between, the Government of Manipur also passed an Act called the Manipur Loktak Lake (Protection) Act, 2006 for better management of the lake and to accrue maximum benefit from it without compromising its sustainability. [2]

Coming to the issue of economic valuation concerning Loktak lake there is a lacking of adequate data (going for primary data is also not possible for such a large scale magnitude). However, according to secondary data available it is known that an economic valuation of the various environmental services of Loktak Lake was undertaken to demonstrate and quantify the "hidden economy" using various valuation tools. Wetlands International has carried out detailed economic evaluation of Loktak lake through financial support provided by MoEF (Ramsar Secretariat, 2008: 20). The assessments revealed that the annual benefits from Loktak Lake at 2006-2007 prices stood at Rs. 600 million, which is equivalent to nearly 2% of the state's gross domestic product (Kumar, 2010: 50; LDA et al 2010). Direct benefits through provisioning of fisheries, water for hydropower generation and vegetation for use as fuel, food, fodder and raw material for handicrafts account for 48% of the overall benefits. Water use for hydropower generates 74% of the direct benefits accrued, while fisheries and vegetation account for 18% and 8% of the benefits respectively (LDA & WISA, 2010:20) [2]. Indirect benefits based on regulating, supporting and cultural features account for 52% of the overall benefits derived from the lake (Ibid). Nutrient retention functions of phumdis form the basis of 12% of non-use benefits (Ibid). Besides, the value of the same phumdis can be deduced from the fact that it also annually captured 478.6 tonnes of nitrogen, 39.6 tonnes of phosphorous and 157.2 tonnes of potassium, thereby playing a critical role in determining the water quality of wetland (Meitei et al 2011: 9). The Keibul Lamjao National Park which is situated in the Southern part of the Lake itself is also of immense value because of it being the only natural habitat of Sangai (brow antlered deer), one of the most

endangered species in the world, but it comes under non-market value. Thus, the assessment clearly indicated that more than half of the total benefits derived from Loktak Lake do not have market based prices. This led to significant underestimation of the overall contribution of Loktak Lake to the regional economy, and dominance of the more tangible use of lake resources, i.e. for hydropower generation. Over the year, with more advanced tools and indepth research, the economic value of the lake has further been enhanced. According to a new study it is accepted that the natural capital asset worth of Loktak has increased to around Rs 63.8 billion (US\$ 1.06 billion) (MoEFCC & GIZ, 2016: VI). [4]

However the tragic part of the story is that most of the stakeholders have got very little awareness on this matter and as such are not concern much about the sustainability matter of the Lake, though some initiatives for protection of the lake could be seen in the community level recently. Even the government as a whole, it seems, as such is not working with the required momentum in this direction, though its agency LDA is engaged in its own capacity. Consequently, despite the immense potentiality and value, there is visible sign of all round degradation of the lake ecosystem and its related potentials. Degradation of the phumdis in the habitat of the endangered Sangai deer, decreasing quality of the lake water due to poor circulation and flushing pattern, decreasing fisheries caused by pollution within, and reducing catchment areas because of heavy human encroachment, are some of the immediate problems concerning Loktak Lake thus compromising its value factor.

2. CONCLUSION

Having discussed all these it is not that easy to give an actual valuation as the initiatives are not absolute. According to expert like Alan Lambert economic valuation methods are not perfect yet and some are even controversial but they are certainly good enough to be used to give valuable information that people often do not perceive. The production of goods and services is closely linked to the functioning of the ecosystems (hydrology, soil, water quality...) and the economic valuation has to take this reality into consideration at every stage. The value of Loktak lake to the people of Manipur in particular and the world as a whole is immeasurable and needs an all-round initiative to sustain its direct as well intrinsic benefits in the long run keeping in mind the above fact. This is also the mission objective of the Ramsar Convention on Wetlands. It clearly emphasized the conservation and wise use of all wetlands through local and national actions and international cooperation, as a contribution towards achieving sustainable development throughout the world (The Ramsar Convention, 2014). Further, the Convention also emphasized the need for the implementation of the concept of "wise use" of wetlands by strengthening the capacity of countries to manage their wetland resources in perpetuity and contributing to the integration of wetland conservation and management with the development process. This aspect need to be linked properly with maintenance and development of the Loktak lake too (Ramsar Convention Secretariat, 2016: 55) [5].

Valuing wetland like Loktak Lake is not limited to valuing the economic and monetary benefits wetland ecosystems can bring to humans. It is about attributing a value to all kinds of benefit to humans and/or to nature, including religious values, social values, environmental values, aesthetic values and any other. All values are good. The challenge is to set priorities according to local realities and for the benefit of both humans and nature. However in a struggling economy like ours it is not always easy for most people to keep in mind all these values. Rather in most cases the economic value tends to overstate the others. Proper synchronization of the needs of the people with that of the environmental benefits of the Loktak Lake taking into consideration the long term sustainability and value factor is a must. A multi-pronged approach involving the stakeholders in any valuation process thus making them more aware of the actual values of the lake, many of which are of irreparable nature, will go a long way. This will help in a more rational valuation

process as well as help in the conservation of this lake. Ultimately, the overall focus of the paper briefly indicating the economic valuation of Loktak lake is to bring out the significant economic and ecological importance of the lake to the region and to the country as a whole, so that its sustainability issue is taken with utmost care by all the stakeholders [6].

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