

Socio-Economic Considerations and Stakeholders' Attitudes Towards Conservation and Management of Wetland Ecosystem: A Case Study

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ABSTRACT

The present study is a field report of a Ramsar site, viz., Loktak Lake of Manipur, India. The Loktak Lake is the largest natural fresh-water lake in the northeastern region of India, and it is distinct from others because of the presence of floating islands known as phumdi and brow-antlered deer, locally known as Sangai. The Lake is also a water source for hydroelectric power project and various benefits are derived, viz., fish, food, fodder, fuel, wild vegetables, materials for thatching, fencing, medicinal plants, religious and cultural matters, etc. The Lake is, however, continuously degrading and facing certain conservation issues. In this paper we had tried to assess the socio-economic characteristics, resource dependency, and attitude towards conservation. A questionnaire survey was inducted for the study and a total of 350 respondents were selected from 25 villages and 7 urban areas surrounding the Lake. The results reveal that majority of the respondents belong to low-income levels with low education levels and are engaged in traditional occupations of fishing and farming. The local community is highly dependent on the Lake resources for their livelihood. The study also revealed that the local communities have a positive attitude towards conservation, and they are willing to participate in the conservation process even by means of monetary contribution. Hence, it is imperative to create an appropriate policy environment to encourage more participatory or inclusive approaches in the conservation of the wetland to avoid any resource use conflicts, which may lead to 'tragedy of commons'.

Keywords: Loktak Lake, Socio-economic variables, attitude, local community, conservation, and management

Mathematics Subject Classification: 62P12, 62P20, 62P25, 91B76,

Journal of Economic Literature (JEL) classification: Q20, Q25, Q50, Q56, Q57

1. Introduction

Wetlands are one of the most productive and life-supporting ecosystems. They play a central role in human civilisation by providing diverse benefits, both tangible and intangible, such as rice, fish, recreation, and ecological functions like groundwater recharging, nutrient retention, etc. Brander and Schuyt (2010) had estimated the economic value of the world's wetlands at US \$ 3.4 billion per year.

However, wetlands are under heavy pressure due to unsustainable practices followed (Mitsch and Gosselink 1993). According to a study by Millennium Ecosystem Assessment (MEA 2005), 15 out of 24, i.e., approximately 60 per cent of the ecosystem services are being degraded or used unsustainably. With its varied topography and climatic conditions coupled with an average annual rainfall of over 130 cm, India supports and sustains unique and diverse wetland habitats (Prasad et al. 2002). According to Space Applications Centre (SAC), ISRO, Ahmedabad (2013), wetlands area in India is estimated at 1,52,60,572 ha which is about 4.63 per cent of the geographical area. There are 26 wetlands of India which are designated as Ramsar sites and their area is 6,89,131 ha, which is about 4.5 per cent of the total wetland area. 70 per cent of India's wetlands are under paddy cultivation (MoEF 1990), and inland fisheries contribute 66.81 per cent in total fish production of the country (MPEDA 2017). Though wetlands contribute significantly to nutrition and food security in the country, they are facing continuous degradation. Foote et al. (1996) had identified 12 kinds of causes for wetland loss, viz., i) agricultural conversion, ii) direct deforestation, iii) hydrologic alteration, iv) inundation, v) defoliation, vi) altered upper watersheds, vii) accumulative water demands, viii) water quality degradation, ix) wetland consolidation, x) global climate change, xi) ground water depletion, and xii) exotic species and biodiversity.

North Eastern Region (NER) of India is well endowed with forest and water resources. The region is identified as global hot spot of biodiversity (Chatterjee et al. 2006). As per North Eastern Space Applications Centre (NESAC), Umiam, Meghalaya, there are 7,731 wetlands in the region with additional 11,736 very small wetlands and altogether they account for 4.17 per cent of the total geographical area of the region. The wetlands of the region support globally threatened ecological communities, support a large number and variety of fish species, source of food for fishes, largest concentration of aquatic birds, migratory waterfowl, and even mammals (SAC 2013).

The major wetlands of NER designated as Ramsar sites are Deepor Beel (also spelt as Dipor Bil) in Assam, Loktak Lake in Manipur, and Rudrasagar Lake (also known as Rudijala) in Tripura. The present study is about Loktak Lake of Manipur. A brief description of Loktak Lake is presented in the next section.

2. Description of the Study area

Loktak Lake is a natural fresh-water lake. It has been designated as Ramsar site since 1990 and later included in the Montreux Record in 1993, thereby highlighting the importance as well as continuous degradation that is taking place in the Lake (www.ramsar.org). It is situated in the Bishnupur district of Manipur, a northeastern state of India. It is an oval shaped floodplain wetland with an area of 287 sq. km. and located between 93°46' and 93°55' E and from 24°25' to 24°42' N. The maximum length and width of the Lake is 32 km. and 13 km. respectively with the depth varying between 0.5 m and 4.6 m, whereas the average depth is 2.7 m. (Trisal and Manihar 2004). The Lake is considered as the lifeline of Manipur as local communities depend on it for food, feed, fibre, fuel, shelter, etc. The Lake is also important from the cultural point of view, and it is considered a sacred place. The epic love story of Khamba-Thoibi of Moirang was born in and around Loktak Lake.

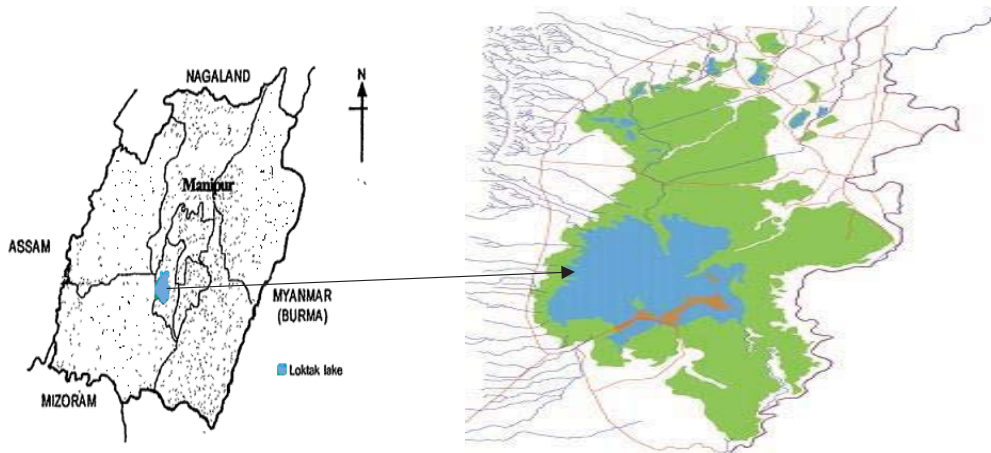


Figure 1. Map of Manipur, and Loktak Lake

The Loktak Lake is very distinct from other wetlands because of two main characteristics, namely, *Phumdi* and *Sangai* and its natural habitat Keibul Lamjao National Park. Phumdis are a large mass of soil, vegetation, and organic matter at various stages of decay and decomposition and they float over the Lake. They occur in various sizes and thickness and occupy around half of the surface area of the Lake. They harbour several plant species and support a rich biological diversity. They govern the water quality and nutrient dynamics of the Lake. They directly/indirectly maintain the ecological balance of the Lake (Trisal and Manihar 2004; Singh and Singh 1994).

Sangai, local name of the brow-antlered deer (*Cervus eldi eldi*) is the state animal of Manipur. The south-western part of the Loktak Lake is composed of a continuous mass of floating phumdis and it is the only floating wildlife reserve in the world. It is the natural habitat of *Sangai* and is known as Keibul Lamjao National Park since 1977 (bishnupur.nic.in).

MoEFCC (2020) has identified the values and benefits of the Lake as the following:

- i. Source of drinking water
- ii. Water for 105MW hydropower
- iii. Livelihood for 5000 fishers
- iv. Medicinal and ornamental plants
- v. Carbon sink
- vi. Protection from floods
- vii. Purifies wastewater
- viii. Groundwater recharge
- ix. Lifecycle maintenance
- x. Tourism and recreation
- xi. Scientific and educational importance
- xii. Revered as Loktak Ima

MoEFCC (2020) has also identified various threats of Loktak Lake, namely, water regime alteration by Ithai barrage, siltation, pollution, unsustainable water abstraction for hydropower, spread of *phumdi*,

and fragmentation by roads. The Lake is also very rich in species with the presence of 116 birds, 54 fishes, 22 mammals, 68 reptiles and amphibians, and 200 plus plants (MoEFCC 2020).

The Loktak Lake is facing serious conservation issues and is degrading continuously. The construction of Ithai barrage for electricity generation is one of the main reasons for the changing scenario of the Lake. It has led to serious disruption in the hydrological regime of the Lake, thereby leading to its degradation. The practice of jhum cultivation in the catchment areas, construction of houses, roads, deforestation, use of pesticides, insecticides, and other chemicals in adjacent agricultural fields, deposits of sewage, garbage, and other household wastes in the feeder streams significantly contribute to the deterioration of water quality, soil loss, pollution, siltation, and water holding and overall capacity of the Lake. This had resulted in the loss of lake resources like fish and plant species which are unique to the Lake (for more details on changing scenario of Loktak Lake please refer, Singh (H) 2014, Singh (L) 2014, Singh and Moirangleima 2012, Singh and Singh 1994, Trisal and Manihar 2004, WAPCOS 1988).

3. Rationale and Objective of the Study

Ramsar Convention on Wetlands (2018) has highlighted that wetland provide essential ecosystem services and contribute to people's livelihood. However, the policy and decision-makers largely unrecognize the value of wetlands. The Convention has clearly stated that conservation and management of wetlands require participation of all stakeholders. It further stated that effective management of wetlands requires collaboration from many sectors of society, particularly those who use the many benefits provided by wetlands or who can influence their management and conservation (Ramsar Convention on Wetlands 2018).

Several studies have also highlighted the importance of involving local communities in managing natural resources and the danger of excluding them. Some of the studies which are worth mentioning here are, Ambastha et al. 2007, Badola et al. 2012, Gibbs and Bromely 1990, Gibson and Marks 1995, Govan et al. 1998, Kothari et al. 1995, Leishangthem et al. 2012, Panwar 192, Pimbert and Pretty 1997, Pyrovetsi and Daoutopoulos 1997, Sah and Heinen 2001, Tomicevic et al. 2010, Wells and Brandon 1993, and Western et al. 1994. These studies have argued for a new conservation paradigm, 'community-based conservation', and stated that any conservation that alienates local communities is unjust and harmful to conservation. They have also stated that sustainable management of resources requires 'co-operation and support of local people', and conservation will succeed if 'local communities receive sufficient benefits, participate in management, and therefore, have a stake in conserving the resources. It is, therefore, necessary to understand the resource dependence and the attitude of local people towards conservation. With this background, we conducted the study on one of the Ramsar sites of NER, keeping the following objectives in mind.

The objective of this study is to report the findings of a household questionnaire survey conducted in and around Loktak Lake. The present study is an attempt to assess the socio-economic profile, dependency level, benefits derived, and attitude towards conservation of the Lake. The paper had also tried to assess the relationship among the socio-economic variables and its effect on conservation and management of Loktak Lake. As such the present study is an attempt to assess the socio-economic

profile of the people in and around the Lake, their resource use pattern, and their willingness to participate in conservation and management of the Lake.

4. Data collection for the Study

The study was conducted in the districts surrounding the Loktak Lake, viz., Bishnupur and Imphal West. There are 53 settlements (43 villages + 12 towns) located in and around the Lake (Trisal and Manihar 2004). Our survey design consisted of two stages. In the first stage, we selected 17 villages and 5 urban areas from Bishnupur district and 8 villages and 2 urban areas from Imphal West. The selection of the villages and urban areas for the study is based on: i) the dependency of the population on Loktak Lake, ii) to represent a continuum of distances from the Loktak Lake, and iii) rural and urban population. The names of the villages and urban areas are given below:

Table 1: Survey areas of Imphal West district

Sl. No.	Imphal West district	
	Urban areas	Villages
1.	Mayang Imphal	Shamusang Shantipur
2.	Wangoi	Salan Paobitek
3.		Paobakchao
4.		Uchiwa
5.		Sekmaijin
6.		Hayel
7.		Laphupat Tera
8.		Komlakhong

Table 2: Survey areas of Bishnupur district

Sl. No.	Bishnupur district	
	Urban areas	Villages
1.	Nambol	Ishok
2.	Oinam	Waheng Khuman
3.	Bishnupur	Naranseina
4.	Ningthoukhong	Khoijuman Khullen
5.	Moirang	Khoijuman Khunou
6.		Toubul
7.		Keinou
8.		Ngaikhong
9.		Thinungei
10.		Ithai
11.		Potsangbam
12.		Sunusiphai
13.		Upokpi
14.		Nachou
15.		Thanga
16.		Ithing
17.		Karang

In the second stage, a total of 350 sample households were randomly selected for the survey from the above selected areas for the study. A structured questionnaire was designed for in-depth interviews with the sample respondents to assess the stakeholders' social, economic, and attitudinal characteristics and gain insights on dependency level and perception on conservation and management of the Lake. The survey was conducted during June – December 2019. The data collected were analyzed using SPSS and MS-Excel. We present the findings of the study in the next section.

5. Results and Discussion

The socio-economic characteristics of the respondents are presented in table 3. In the total sample of 350, the male respondents are 191 (54.57 per cent) and female respondents are 159 (45.43 per cent). The mean age is found to be 44.19 with standard deviation of 15.11. The minimum age is 15 years, whereas the maximum age is 86 years. Around 48.90 per cent of the respondents' age range is 36-55 years with 29.10 per cent below the age of 35 years and 22 per cent above 55 years. We may safely conclude that the sample is representative in terms of both gender and age. Majority of the respondents are married (80.60 per cent) and belong to Hindu religion (70.90 per cent). Most of the respondents belong to general category (56 per cent) followed by Other Backward Class (OBC) with 29.40 per cent. The average family size of the sample households is found to be 5.55 with a standard deviation of 1.95. The family size varies between 2 and 13. Majority of the households, i.e., 45.10 per cent and 25.90 per cent lie in the family size range of 4-5 and 6-7 members respectively. As per Census 2011, the average family size in India is 4.8 and for the state of Manipur it is 5. Thus, we see that majority of the sample households' family size is in congruent with the average family size of the Census.

Table 3: Socio-economic characteristics of the Respondents

n = 350			
Characteristics	Category	No.	Percentage (%)
Sex	Male	191	54.57
	Female	159	45.43
Age	≤ 35	102	29.10
	36-55	171	48.90
	> 55	77	22.00
Religion	Hindu	248	70.90
	Muslim	18	5.10
	Christian	15	4.30
	Meitei	69	19.70
Caste	General	196	56
	OBC	103	29.40
	SC	43	12.30
	ST	8	2.30
Marital Status	Married	282	80.60
	Unmarried	68	19.40
Family Size	≤ 3	38	10.90
	4-5	158	45.10
	6-7	101	28.90

	8-9	38	10.90
	> 9	15	4.30
Education	Illiterate	65	18.57
	Primary	76	21.71
	Secondary	51	14.57
	Hr. Secondary	58	16.57
	Technical Diploma	2	0.57
	Bachelor's degree	59	16.86
	Postgraduate	32	9.14
	Others	7	2.00
Monthly Income	≤ 5000	39	11.14
	5001-10000	103	29.42
	10001-15000	65	18.58
	15001-20000	47	13.42
	20001-25000	16	4.58
	25001-30000	26	7.42
	30001-50000	29	8.28
	50001-1 Lakh	23	6.58
	> 1 Lakh	2	0.58

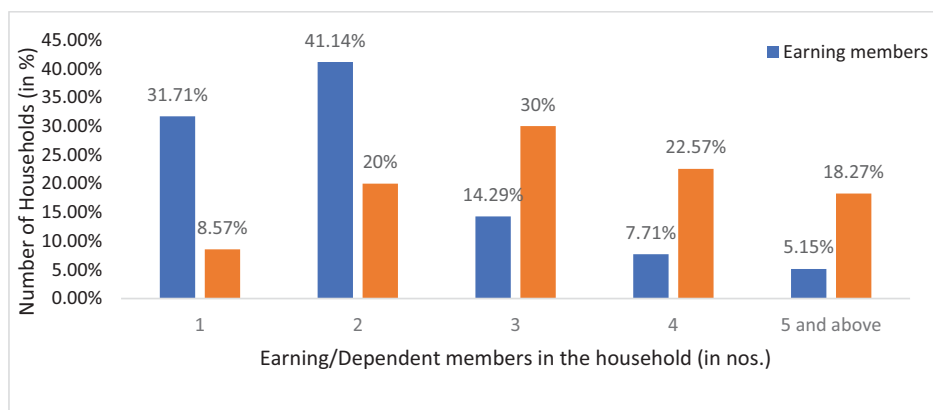
Source: Field survey

The level of education plays an important role in sustainable use of natural resources. In the survey, we have considered only the education level of the head of the household. It is found that 18.57 per cent are illiterate, 21.71 per cent have primary degree, 14.57 per cent have secondary degree, and 16.57 per cent have higher secondary degree. Out of the sample respondents, 16.86 per cent have bachelors' degree, whereas only 9.14 per cent have post graduate degree. The poor performance in the field of education may be attributed to the location. The survey was conducted mostly in rural areas and lying in periphery with the Loktak Lake. As such these places do not have proper educational facilities. The schools present in these areas offer degree up to primary and secondary level. For higher studies, people must go to nearby town or other places, as colleges and higher secondary schools are present only in urban areas.

The level of education has an impact on the earning capacity and job opportunities of the people. Similar to education level, we have taken into account the monthly income of the head of the household. It is seen from table 3 that only 2 respondents (0.58 per cent) out of 350 respondents earn a monthly income more than Rs. 1 lakh. Majority of the respondents (72.56 per cent) have monthly income of Rs. 20,000/- and below, whereas 26.86 per cent of the respondents have monthly income in the range of Rs. 20,001/- – Rs. 1 lakh. The monthly income level of the respondents is not only low but at the same time the dependency ratio is also high. The number earning member in sample households varies between 1 and 9, whereas the number of dependent members varies between 0 (zero) to 10. The distribution of earning and dependent members is shown in figure 2. It is observed that dependent member is higher than earning member among the sample households with 31.71 per cent having only 1 earning member

and 41.14 per cent have 2 earning members. It is also observed that 18.27 per cent have more than 5 dependent members in the household followed by 22.57 per cent with 4 dependent members and 30 per cent with 3 dependent members. This indicates that dependency ratio of unemployed to employed persons is rather high in these areas which points towards the fact that unemployment is a serious issue which is true for the state of Manipur as a whole.

Figure 2: Distribution of Earning and Dependent Members



Source: Field survey

5.1 Land holding

The land holding pattern of the sample households is shown in table 4. It is observed that about half the respondents (53.14 per cent) own agricultural land the rest half (46.86 per cent) do not own any agricultural land. The average land holding size is 1.35 acre with a standard deviation of 1.49. It is also observed from table 4 that majority of the respondents fall under the category of small and marginal land holdings.

Table 4: Land holding size of the sample households

n = 350			
Characteristics	Category	No.	Percentage (%)
Agricultural land	Agricultural land owned	186	53.14
	No Agricultural land	164	46.86
Land holding (wet)	0-1 acre	226	64.57
	1.1-2 acres	62	17.71
	2.1-3acres	41	11.71
	3.1-4acres	9	2.57
	4.1-5acres	6	1.71
	5.1 acre and above	6	1.71
Land holding dry	< 1 acre	345	98.57
	1acre and above	5	1.43
Land holding total	≤1 acre	201	57.42

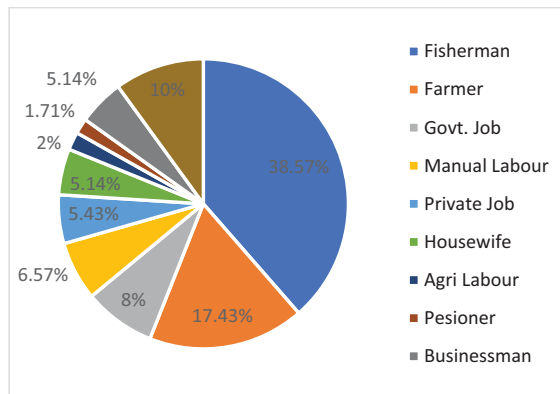
1.1-2 acres	67	19.14
2.1-3 acres	48	13.72
3.1-4 acres	19	5.42
4.1-5 acres	2	0.59
5 acres and above	13	3.71

Source: Field survey

5.2 Occupation Pattern

The occupation of the people is also another important factor in making decisions towards better conservation and management of natural resources. Here also we have considered only the occupation of the head of the households. The distribution of occupation pattern among the sample respondents is shown in figure 3. It is observed that majority of the respondents are fisherman (38.57 per cent) followed by farmer (17.43 per cent). About 10 per cent belong to others and they mostly consist of shopkeeper, carpenter, construction worker, etc. Another major observation is that only 8 per cent of the sample respondents are engaged in government sector jobs.

Figure 3: Occupation

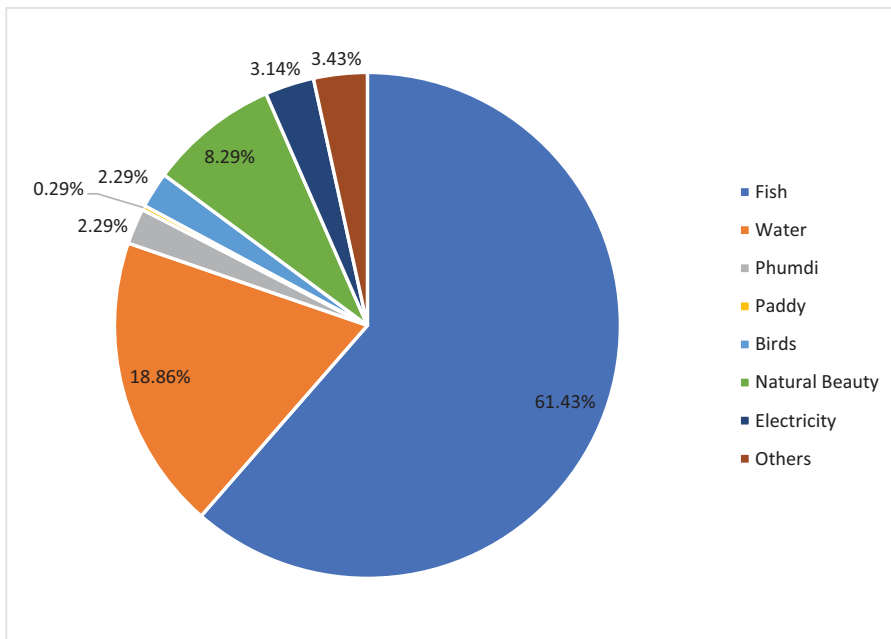


Source: Field survey

The pattern of occupation, education level, land holding pattern, dependency ratio, and monthly income scenario all bear testimony to the fact that the areas lying in periphery with Loktak Lake are lacking behind in many areas of development. As such these people depend heavily on the resources of the Lake for their livelihood. The perception of these people towards the Lake as source of livelihood and their attitude towards sustainable use and better conservation and management of the Lake is discussed in the next section.

5.3 Perceived Benefits of Loktak Lake

The sample respondents' assessment of the Loktak Lake can be understood from their response to the perceived benefits they derive from the Lake. It is found that fish is the most important benefit (61.43 per cent) followed by water (18.86 per cent). Other benefits derived from the Lake are natural beauty, electricity, birds, phumdi, others, etc. (Figure 4).

Figure 4: Benefits derived from Loktak Lake

Source: Field survey

Fish is a staple food of Manipur, and it is included in daily meals of a Manipuri household. Loktak Lake is an important source of fish. Sixty-four species have been identified among fish fauna of Loktak Lake (Singh and Singh 1994). The Lake has traditionally been open water capture fishery. Before the 1950s, the Lake accounted for about 60 per cent of the total fish production of the state, which declined to 11 per cent of the total fish production of the state. Open access to the fisheries resources of the Loktak Lake has led to indiscriminate fishing without considering the regenerative capacity of the fish stock (Trisal and Manihar 2004), leading to the tragedy of commons scenario. Some of the fish varieties found in the Loktak Lake have either disappeared or their population have decreased drastically. However, to meet the demand for fish and compensate the loss of fish varieties in the lake, several steps like the introduction of fingerlings of the variety of Indian major carps, aquaculture development, training to fish farmers, etc. have been taken up. This has helped in producing 80 per cent of the total fish seed requirement of the state.

Table 5: Some fish varieties whose population have decreased

Local name	Scientific name/ Zoological name
Ngaton	<i>Labeodero</i>
Khabak	<i>Labeoangra (Ham Buch)</i>
Pengba	<i>Good eating but bony fish/ Labeoalfridiana</i>
Tharak	<i>Osteobrama belangui</i>
Ngakra	<i>Clericas batrachus</i>
Ngatin	<i>L. panguisa</i>
Ngara	<i>Accrossocheilus Hexagonolepis</i>

Meitei ngamu	<i>Chana orientates</i>
Ngaprum	<i>Monopetrus albus</i>
Shareng	<i>A big and fairly good eating fish/ Wallago atta</i>
Ukabi	<i>Anabus testudinus</i>
Ngachik	<i>Sting cat fish/ Heteropneustes fossils</i>

Table 6: Some common fish varieties of Loktak Lake

Local name	Scientific name/ Zoological name
Rou	<i>Labeo rohita</i>
Porong	<i>Ophio cephalus striatus</i>
Puklaobi	<i>Common carp/ Scale carp/ Cyprinus earpio carpio</i>
Napi chabi	<i>Grass carp/ Ctenopha ryngodon idella</i>
Catla	<i>Catla catla</i>
Khajing	<i>Shrimp/ prawn/ Decapod crustaceans</i>
Mukanga	<i>A small kind of fish – mostly sold in smoked form</i>
Phabounga	

Figure 5: Fisherman in a boat at Loktak Lake (L); Aquaculture farm (R)


Source: Field survey

Among other benefits derived is the presence of a variety of aquatic, semi-aquatic, and terrestrial plants. These plant varieties are used as vegetables, food, fodder, fuel, thatching, fencing material, medicines, raw material for handicrafts, and for religious and cultural matters.

Table 8: Some vegetation of the lake used for commercial purposes

Local name	Scientific name
Tou	<i>Phragmites karka</i>
Singnut	<i>Erianthus arundinaceus</i>
Imom	<i>Saccharum spontaneum</i>
Charot (Haona)	<i>Cymbopogon nardus</i>

Table 7: Some vegetation of the lake used for food

Local name	Scientific name
Heikak (water chesnut)	<i>Trapa natans</i>
Thanjing (gorgan nut/ fox nut)	<i>Euryale ferox</i>
Tharo (water lily)	<i>Nymphaea pubescens</i>
Thambal (lotus)	<i>Nelumbo nucifera</i>
Loklei	<i>Hedychium coronarium</i>
Pulei	<i>Alpinia galangal</i>
Komprek	<i>Oenanthera javanica</i>
Yellang	<i>Polygonum barbatum</i>
Kolamni	<i>Ipomoea aquatica</i>
Peruk (Indian pennywort)	<i>Centella asiatica</i>
Kakthrum (water plantain)	<i>Alisma plantago-aquatica</i>
Koukha (arrowhead)	<i>Sagittaria guayanensis</i>

5.4 Development at the cost of natural resources

The dichotomy over development and conservation exists everywhere. It is the same in case of Loktak Lake too. In response to the question of development at the cost of natural resources we have mixed views as shown in table 9. About 37.43 per cent of the respondents are not in the opinion of taking up developmental works which have adverse impact on environment and 6 per cent of them have strongly rejected the view of development at the cost of natural resources. Surprisingly 24.57 per cent of the respondents agree to developmental work even if it degrades the environment, whereas 23.14 per cent have expressed indifference between development and environment degradation.

Table 9: Responses regarding Developmental works with Environmental degradation

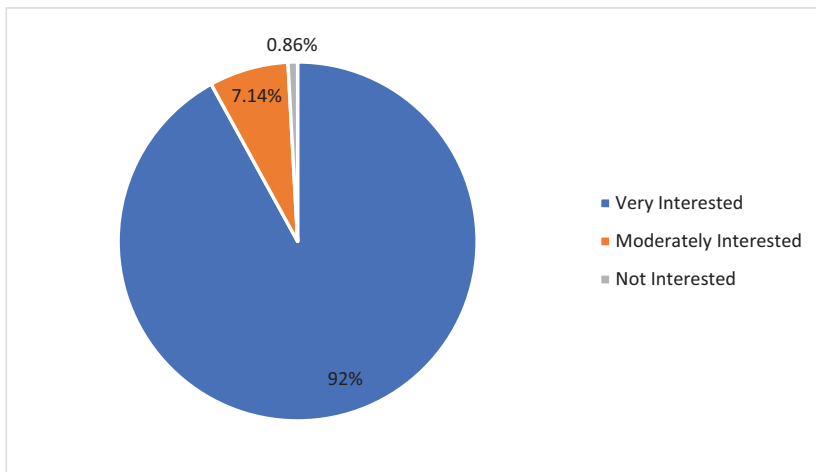
n = 350			
Question	Responses	Number	Percentage (%)
Whether developmental activities should be initiated that degrades the environment?	Strongly agree	31	8.86
	Agree	86	24.57
	Indifferent	81	23.14
	Disagree	131	37.43
	Strongly disagree	21	6.00

Source: Field survey

5.5 Conservation and Willingness to Pay

The attitude of the stakeholders towards conservation and management of the Lake is important for any policy intervention. With respect to interest for the conservation of the Loktak Lake, majority of the respondents (92 per cent) have expressed their interest. Only 7.14 per cent have expressed moderate interest with about 0.86 per cent of the respondents saying that they are not interested in conservation of the Lake (Figure 6).

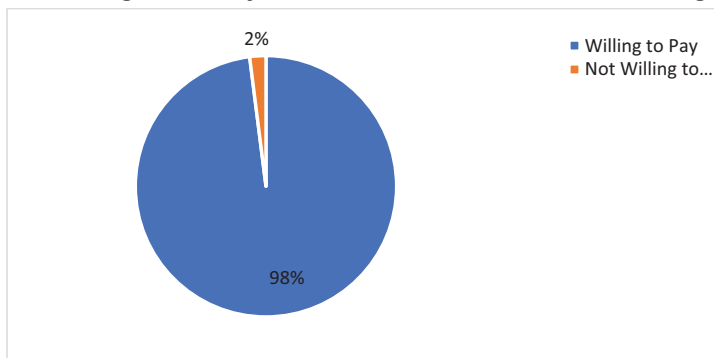
Figure 6: Interest in Loktak Lake Conservation and Management



Source: Field survey

Similarly, majority of the respondents (98 per cent) are willing to pay for better conservation and management of the Loktak Lake, while the rest 2 per cent are not willing to pay (Figure 7).

Figure 7: Willingness to Pay for Loktak Lake Conservation and Management

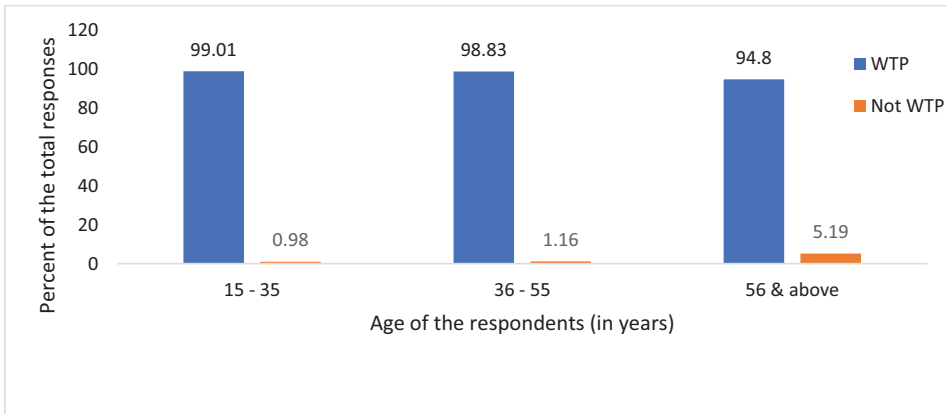


Source: Field survey

It is interesting to note that some elderly people have expressed against any form of payment towards conservation of the Loktak Lake. Their view is that since they are inhabitants of the Lake since time immemorial, they should not be excluded from deriving the benefits of the Lake. They are also of the opinion that they are the ones who take care of the Lake since they have been living in the Lake since time immemorial. Hence, the question of asking them to pay for any measures towards conservation and management of the Lake is irrelevant. The conservation and management are considered as the sole responsibility of the government. This is the fundamental problem of "free ridership" that all policy makers face in managing a public good. However, this is not the case with younger generations. The younger generations are more concerned about the environment, and they are willing to participate and

contribute including monetary contributions for conservation and management of the Lake. This can be observed from figure 8 where we have tried to associate willingness to pay with age.

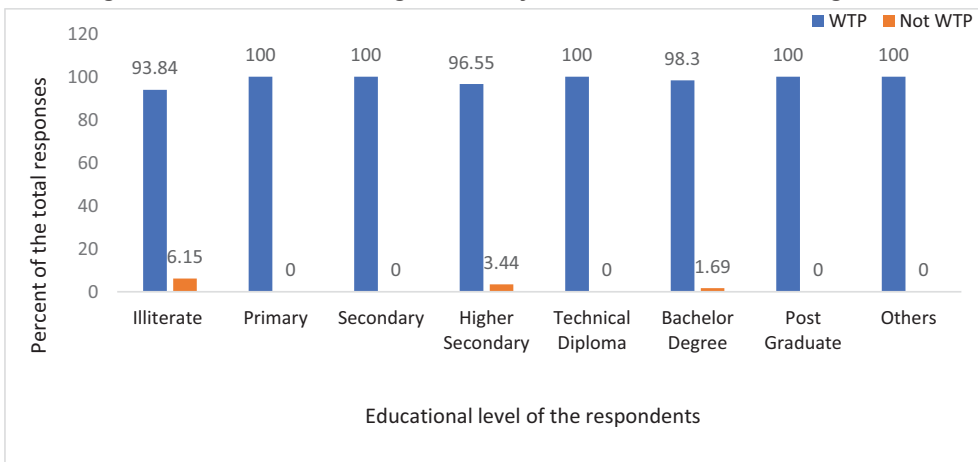
Figure 8: Age Vs Willingness to Pay for Conservation and Management



Source: Field survey

With respect to level of education and willingness to pay, it is observed from figure 9 that majority of the respondents are willing to pay across all education levels. It can, thus, be said there is no direct influence of education on willingness to pay for conservation and management. Since they are willing to pay irrespective of the level of education, we may safely conclude that the stakeholders are aware of the changing scenario of the Lake and their dependence on its resources, and hence willing to contribute towards its conservation.

Figure 9: Education Vs Willingness to Pay for Conservation and Management

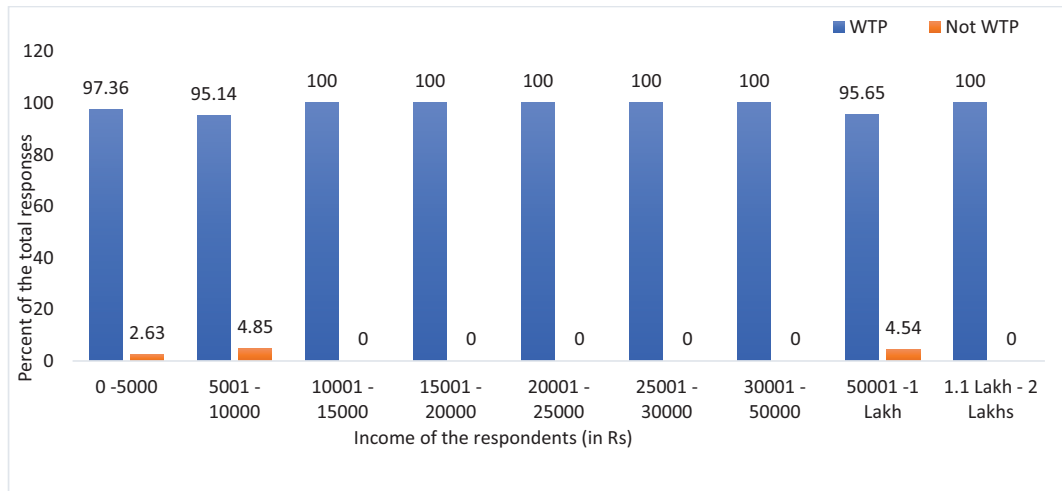


Source: Field survey

Similarly, with respect to level of income and willingness to pay, we also observe that the stakeholders are ready to pay across all income levels as shown in figure 10. This may because they feel that if the

Lake resources are conserved and better managed, more benefits will be derived from the Lake, thereby, contributing to their earnings. Hence, they are ready to part with their income for better management and conservation of the Lake.

Figure 10: Income Vs Willingness to Pay for Conservation and Management



Source: Field survey

6. Concluding Observations

The attitudes of the local communities and their continuous involvement in conservation activities are important for sustainable conservation of resources (Tomicevic et al. 2010). Conservation concepts and practices need to be relevant to the day-to-day life of the local people (Borrini-Feyerabend et al. 2004 a, b) and natural resource management practices should be organized around a 'social learning paradigm' (Korten 1990, Pimbert and Pretty 1997). Thus, understanding the socio-economic status, resource use patterns and attitudes towards conservation is critical (Sah and Heinen 2001).

The present paper, as stated above, is a field report to assess the socio-economic characteristics of the people living in and around a Ramsar site, viz., Loktak Lake and their perception on sustainable use and better conservation and management of the Lake.

We observe that the people living in and around the Lake are not very well-off. They are economically backward with low level of income, low education level, and most of them are engaged in traditional occupations of fishing and farming. This only shows that they heavily depend on the Lake for their sustenance livelihood. However, these people have positive attitude towards conservation and are willing to participate and contribute towards sustainable management of the Lake. Almost all the respondents have expressed their approval and willingness to participate in the wetland's better conservation. For the sake of better conservation, they are ready to contribute a part of their monthly income. This point, invariably, indicates that the stakeholders hold very high value for the wetland resource. Even with meagre income and small land holdings, they are willing to part a portion of their income to conserve and manage the Lake. The local people possess significant indigenous knowledge on traditional fishing and farming and are aware of the consequences of the development process on

environment, and thus willing to participate actively in better management of the Lake resources. As majority of the local people depend on the Lake resources for their livelihood, they are willing to conserve the Lake by bearing the cost in the form of monetary payments for conservation. The local stakeholders have positive attitude towards conservation cutting across age, education level, and income level, and these are the major strengths for any policy intervention indicative of homogeneity of their preference for the improved conservation of the wetland.

The study also observed that the respondents from higher age groups have expressed their reservation against any form of monetary payments for the conservation of the Lake, which they perceive to be their own. They consider themselves to be the custodian of the Lake, and part and parcel of their life and livelihood since their childhood. They have always taken care of the Lake and will always take care in the future as well. They consider the resource to be so precious that placing a value itself will undermine the importance of the same. They also feel that Government has got a responsibility to contribute and conservation the wetland. However, the younger generations have expressed their willingness to actively participate in the conservation and management even by means of monetary contributions. The reluctance to pay for the conservation of the Lake among the higher age groups may be attributed to the operation of lifecycle hypothesis.

The higher interest for the improved conservation of the Lake is indicative of the higher dependency of the primary stakeholders. Around 80 per cent of their main income earning occupation are found to be related to the wetland. This reiterates the theoretical and empirical evidence of the higher dependency level of rural households on the natural resources. As such, any policy initiatives for developing such resource-dependent communities should be integrated with the natural resources management programmes.

Local communities have expressed a strong desire to be involved in the conservation and management of the Loktak Lake. The active commitment and collaboration of the local communities are essential for the management of a wetland. But, unfortunately, the higher levels of interest among the primary stakeholders have not been appropriately accounted in the conservation activities currently undertaken by the State Government through Loktak Development Authority (LDA). It may not be out of place to mention here that the Government of Manipur had enacted the Manipur Loktak Lake (Protection) Act 2006 and established the Loktak Development Authority (LDA) to 'administer the affairs of the Loktak Lake and to protect and improve the natural environment of lake' (Manipur Gazette 2006). However, the LDA is headed by the Chief Minister, Manipur and other members are composed of government officials. There is no representation from the local stakeholders, and they are completely left out of the body responsible for managing the Lake. This has led to conflict among the users and managers of the resources. At times, the management policies come in conflict with the livelihood options of the local communities.

Thus, local communities should be considered an integral part of the Lake due to their historical right over the resource and their dependency on the Lake for livelihood. Any act of alienation of the local community and their livelihood options creates resource use conflict thereby leading to unsustainable resource use of the Lake. It will further degrade the Lake and may result in wetland loss in the future. Hence, supporting the livelihood of the dependent communities should be integrated as part of the

conservation and management policy of Loktak Lake. Hence, it is imperative to bring more participatory or inclusive approaches in the conservation of the wetland. Otherwise, the continuous resource use conflicts will lead to the 'tragedy of commons'.

7. References

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