IOSR Journal Of Humanities And Social Science (IOSR-JHSS)
Volume 27, Issue 3, Series 8 (March. 2022) 34-38
e-ISSN: 2279-0837, p-ISSN: 2279-0845.
www.iosrjournals.org

Responsibility to Conserve Natural Resources of Loktak Lake: A Sustainable Development to the Lake Catchment Areas in Manipur

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Abstract:
The largest freshwater lake in India is Loktak Lake, which is located in the north-eastern state of Manipur. Because of its stunning appearance with greenery flora of floating grass, the lake is one of Manipur's most famous tourist attractions. It is a large lake with a land of 250 to 500 square kilometres during the wet season, with a mean area of 287 square kilometres. Then, for Loktak and Manipur, everything changed abruptly. A single decision triggered a cascade of terrible events that no one could have predicted. In the 1970s, the Manipur government was sold an ambitious project by the National Hydroelectric Power Corporation Limited (NHPC): a power station to utilise the hydropower potential of Loktak Lake. Manipur and its neighbouring states would benefit from the 105 MW power plant's low-cost electricity. It would also offer lift irrigation for the valley's 23,000 hectares of land. The project was approved by the state administration without any consideration of the project's impact on the lake's ecosystem or lives. The objective of the present study is to find out solution to preserve the natural resources and retain for Sustainable Development to the Surrounding Lake Catchment Areas in Manipur. The present paper based on primary and secondary data available from field survey, Government publications, journals and e-sources. Manipur River is the most important as it passes through thickly populated areas and covers the whole of Manipur valley consisting of the five valley districts. Over time, the Barrage has affected the hydrology of the lake and severely affected the ecology and economy of the state. Construction of the Ithai Barrage over the Manipur River is impounding water and great inundation to the low-lying areas of the Loktak Lake. To Protect Ecosystems to the Surrounding Lake Catchment Areas in Manipur decommission of Ithai Barrage and Loktak Hydro Electricity Project.

Keyword: Catchment Area, Floating Grass, Natural Recourses, Hydrology, Decommission

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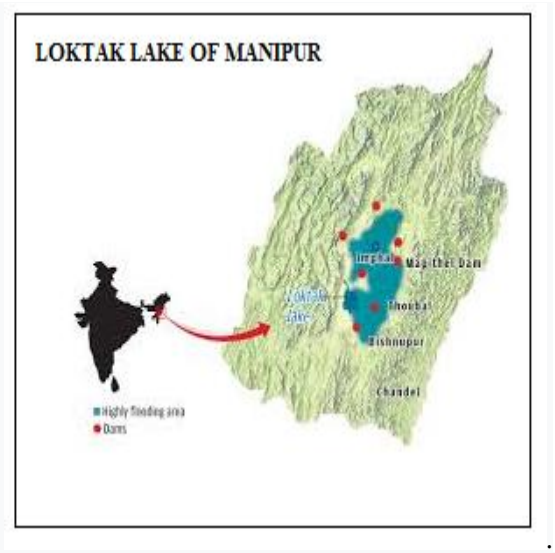
Date of Submission: 12-03-2022 Date of Acceptance: 28-03-2022

I. Introduction

Loktak Lake is a fascinating ecology in Manipur's northeast, which is yet mostly untouched. This beautiful lake, located 53 kilometres from Imphal, is one of the few spots in Manipur where foreigners are permitted to visit. The most intriguing aspect is that the lake is known for its floating islands. Loktak Lake appears to be littered with islands from above, but these are not islands. The Loktak Lake's phumdis (local name) or floating wetlands in the shape of a circle provide a wonderful perspective of the lake. These marshes resemble islands, with varied quantities of vegetation, soil, and organic matter, as well as decomposing humus. During dry weather, the mass of lush green phumdis rests below the surface of the lake, like icebergs, allowing the living roots to reach the lakebed. When the monsoon comes, the living roots absorb nutrients from the lakebed and rise to new heights. Phumdis can grow to be up to 2 metres thick.

The floating phumdis brought Loktak Lake into the limelight, but their out-of-control expansion is causing more of a problem. The environment rapidly changed after the construction of the Ithai Hydropower Dam in the 1980s, south of Loktak Lake, to provide power to Northeast states, and the water level began to remain high all year. Phumdis, which are breaking apart owing to nutrient insufficiency, are unable to sink due to this state. In addition, tangled plant debris lurks beneath the water's surface, multiple rivers flow into the lake, and a rising amount of dirty silt is wreaking havoc. The minimum water level of the Lake during pre monsoon (May) is 765.55 metres above sea level and increased to 768.98 metres (September) above sea level in the post monsoon. Because of high water level during rainy season blocked at the Dam, low-lying places around the Loktak Lake are submerged under water and so the fate of the catchment area is sweaty in the moonlight.



The Keibul Lamjao National Park, located on the Loktak Lake,is the world's first floating Park and the only natural habitate of the "Sangai" (Rucervus eldii eldii), Manipur's dancing deer. Any wildlife enthusiast who visits this unique wetland ecosystem must be seen the dancing deer. The Ithai Barrage was constructed to impound water in the Loktak Lake and harness its potential for hydropower generation (to generate 105 MW of power by three units; each producing 35 MW) and agricultural purposes, including providing irrigation for 24,000 hectares of land in the Loktak surrounding areas. The Barrage has had a long-term impact on the lake's hydrology, as well as the state's ecosystem and economy.

II. Methodology:

The present paper is the outcome of primary data collected fromfield visit and sample survey by questioner from the Loktak catchment areas, secondary data collected from Census of Manipur, Government publications, journals, e-sources, and Statistical Handbook of Manipur. Charts, graph and photo are showing for more details the paper.

The objectives:

-To find out the alternative solution to conserve the natural resources of Loktak Lake causes by devastating due to unstable water level, which damages in both flora and fauna

-To examine the geographical factors that have influenced to restore the degraded environmental phenomenon and sustain the ecology of the catchment area.

III. Discussion

Manipur, one of India's north-eastern states, is located in the "Indo-Burma" biodiversity "hotspot" of global importance. The rate of wetlands decline is alarming due to rapid population growth, other developmental activities, and improper exploitation. According to a survey, India has lost nearly 38 percent of its wetlands in the previous ten years, with many more under jeopardy (Anonymous, 2004b). Because worldwide wetlands are rapidly dwindling, the economic biological resources provided by wetlands are likewise dwindling at the same rate, rendering them unproductive. Wetland plants not only supply food, but they also help to generate revenue and provide a livelihood for a big portion of the local community. Manipur is a veritable garden of wild edible plants (Jain and Singh, 2005). The purpose of this research is to document the economic plants found in Manipur's wetlands, as well as their availability in local marketplaces. Because worldwide wetlands are rapidly dwindling, the economic biological resources provided by wetlands are likewise dwindling at the same rate, rendering them unproductive. The state is rich in both cultural and biological diversity and the people have a close association with the surrounding natural resources.

In the earlier, before the commission of Ithai Barrage, the Khordak channel functioned as both the inlet and outlet water to and from Loktak Lake. During the monsoon season, the Sugnu Hump has controlled the flow of Manipur river water since time immemorial, and the torrential obsiquent stream of the Chakpi River has receded upwards to the point of the Manipur River's Khordak river mouth, where the Khordak channel allowed its inflow into the Loktak. During the dry season, the extra Loktak water is returned to the Manipur River's main stem. It is true that the Manipur River is the only outlet for water from Manipur's central valley, as all of the valley's rivers, streams, and significant water bodies discharge into the Loktak Lake, which is then drained into Myanmar's Chindwin-Irrawaddy system. However, due to the Ithai Barrage, all of these natural streams have

been defunct for more than three decades, posing a serious ecological hazard to the lake and neighbouring surroundings. Furthermore, the construction of the Ithai Barrage (35ft) at a height of 768 m contour (2519.69 foot AMSL) across the Manipur River has had a significant impact on the socio-economic conditions in the Loktak Catchment Area (LCA) in the state.

During the post-monsoon (September), the elevation of Loktak Lake water is 768.98 m (2,522 ft) AMSL, while the level of water is normally low in the pre-monsoon (May) at 765.55 m; the elevation of the Ithai Barrage site is 777.84 m (2,552 ft) AMSL. According to the fluctuation, the difference between the water level of Loktak Lake and the height of the Barrage is 9.75 m (31ft.11inches), which is higher than the water level of Loktak Lake (Fig-1). The Lake's lowest water level is 765.55 metres above sea level in the pre-monsoon (May) and 768.98 metres above sea level in the post-monsoon (September). The lake surrounding low-lying areas had been getting buried 30,000 hectares of land with every shower as the water level rose due to damming at Ithai Barrage at a height of 3.1 m (10ft.2inches) (R. K. Ranjan, 2014). The fate of the Loktak Catchment area has been altered by the Barrage's opening, which has disrupted the normal hydrological cycle and blocked fish migration pathways through the Manipur River. As a result, precious natural resources of fauna and flora of the Loktak Lake are submerged under water. Indigenous riverine native fishes such as Pengba, Khabak, and Shareng have seen a significant reduction in population (Singh, 2018). The increase in the water level of Loktak Lake because of the Ithai Dam has caused a great damage to the production of aquatic plants of food, which are daily food items, and commercial importance to the catchment areas. As for instance, the production of about 30 indigenous varieties of aquatic edible plants, e.g Heikak, Yelli, Thaangjing, Tharo, Thambaal, Loklei, Pulei etc had been significantly reduced due to the failure in the germination and extension of their feet to the bottom soil of the lake. Moreover, the obstruction of Manipur River at Ithai Barrage, important fish species which used to migrate to the lake from the Chindwin-Irrawaddy river system for breeding and spawning purposes has prevailed.

IV. Merits and Demerits of the Lotak Project and Ithai Barrage:

Water is life without water plants and living things cannot be seen. A large section of population settled in the catchment area of Lokta lake has been suffering from water crisis from mismanagement of water resources. Water; not only for drinking, irrigation but production of hydro-electric power supply, transportation etc are the essential for mankind. As a means to remedy these persistent problems, the Loktak hydro electricity power project and Ithai dam were commissioned in Manipur. To observe from all angles, Ithai barrage can be considered as the main gate, which control quantity of water of Manipur Central valley, playing an important role in the environment of the valley as regards to the water supply, water storage, flood, drought, agriculture, fishery, irrigation, power production, aquatic flora etc.

Merits:

-Unless the Ithai Dam was not constructed and leave the Loktak lake to continue the natural process as usual with the increasing siltation into the Lake and land encroachment in the past 30 years, the existing areas of Loktak Lake (276 sq. km.) could have been shrunken largely by about 50 sq. Km.

-The loktak hydro Power Project generates 105 MW of electrical energy has been a significant contribution of Loktak Lake. Out of 105 MW power generations(in 3 phases of 35 MW each), only 35 have been used for Manipur state and the rest 70 MW have been sold to other neighbouring states.

Demerits

Despite the various merit points of Loktak Project and Ithai dam, there are several points of demerit for the project affecting to socio-economic and cultural life of the people of Manipur and environment of the state as a whole. The following are some demerits:

-The maintenance of constant water level (767 m-769 m) which was between 765.51 m and 768.59 m before the presence of the Ithai barrage of has flooded the agricultural land around the lake, which were utilized for cultivation.

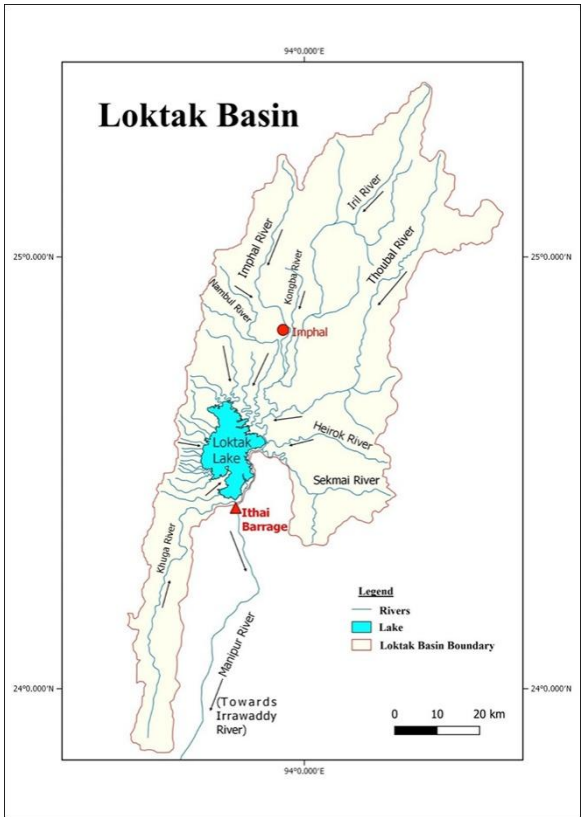
-About 83,450 hectare of arable fertile land has affected by the Loktak project, and loss of about 400 crores by the Loktak project, and a loss of about 400 crores of rupees from the products of the flooded areas.

-One of the major causes of damming at Ithai barrage, it has been disappeared of several indigenous fishes of Manipur e.g. Ngaton, Khabak, Pengba, Tharak, Ngara, Ngatin, etc.

-In the earlier when there were natural regular flow of Manipur River, these fishes migrated from the Chindwin-Irrawady system of Burma to the course of Imphal for breeding in the adjoining lakes and streams of Manipur valley.

-Damage to Aquatic Plants of Flood and Commercial Importance water level of Loktak Lake due to the Ithai barrage has a serious effect on the ecology and existence of endangered Brow-Antlered Deer.

-Increasing Siltation Rate of the Loktak Lake**:** Due to Ithai Barrage, it has affected the usual removal of the silt with the current of water from Loktak Lake. Damming at Ithai Barrage, regular flow of water is very slow and phumdies (floating humus) helped in depositing the silts to Loktak Lake itself from different inlets of the catchment areas of the lake and increase rate of siltation in the lake thereby raising the lake bottom.



Map-1

V. Suggestion

The phumdis used to settle down and be found in touch with the underlying soil, at least during the dry months, prior to the commissioning of the Loktak Hydro Project in 1983. Currently, the situation has changed. The construction of a 10.7-meter-high, 58.8-meter-long llhai barrage downstream of the Manipur River's confluence with the Khuga River impounds water, which then flows back into Loktak via the Khordak and Unga man cuts. This has resulted in the majority of the phumdi being wet throughout the year, and in some sections being completely immersed in water. This has resulted in some obvious alterations in the park's floral canopy. Some concrete suggestions for the Ithai Barrage, which has caused extensive damage to vast agricultural lands and settlers in the Loktak catchment area, which has been submerged under water, include either lowering the barrage by 3 m from its current level or opening the barrage gates during monsoon showers to allow excess water from Loktak to flow through. Afforestation programme across the catchment region of the Manipur River's major tributaries to control water channels, soil erosion, and quick run-off water into streams while maintaining biological balance. There must be coordination among the many project authorities to govern the reserve water among the dams, such as the Imphal Barrage, Thoubal Multipurpose Project, Irill Pilot Project, Khuga Dam, Sekmaijin, and others.

The last and most effective solution for resolving the current heated debates and critical issues surrounding the Ithai Dam is to open the dam during monsoon rains. Many complaints or proposals from the government, NGOs, stakeholders, and associations have been made to the state and federal governments about making alternate arrangements or decommissioning the Ithai Barrage.

VI. Conclusion

Loktak Lake is a fascinating ecology in Manipur's northeast, which is yet mostly untouched. This beautiful lake, located 53 kilometres from Imphal, is one of the few spots in Manipur where foreigners are permitted to visit. The most intriguing aspect is that the lake is known for its rich in flora and fauna in the midst of hotspot in the north east of India. The precious resources of the lake has been tremendously retarding because of properly untapped for uses as medicinal herbs as well as keep the lake ecological balance to the catchment

areas. Moreover, after commissioned the Ithai Dam across the Manipur river, the natural resources of the lake has been flooded during rainy season and floating grasses (*foomdi)* which is unfavoured the movement of Sangai, endangered animal in the world found only in Manipur. On the reverse, Thousands of hectares of cultivable lands and grazing fields are submerged into the water. The degradation of the catchment area has led to the problems of siltation of *phumdies* into the lake itself because of damming at the Ithai. The concrete primary solution to safe natural resources of flora and fauna from the Loktak Lake is to allow faster flow of water of Manipur River after Sekmaijin and draining water from Loktak through Khordak channel and it is advisable to keep the gates of the dam open most of the time during rainy season.

Acknowledgements

Present author express deep gratitude to the principal of the college for financial support, College Research Committee for sharing their full co-operation when ongoing the preparation of the present paper in the College and all local organising committee member of the lake catchment areas who support me during data collection.

References:

[1]. Authority, https://www.loktaklake.org/projects.html# and https://www.loktaklake.org/docs /management-concept.jpg
[2]. C. L. Trisal and Th. Manihar, *The Atlas of Loktak Lake* (Loktak Development Authority, Manipur, India and Wetlands International – South Asia, New Delhi, India. 2004)
[3]. Chabungbam Rajagopal Singh, "Hydrological and Hydraulic Modelling for The Restoration and Management of Loktak Lake, Northeast India" (PhD Thesis, University College of London,2010)
[4]. Hueiyen News Service, "Loktak Phumdi dwellers evicted; Threaten bandh and suicide", *E-Pao,* November 15, 2011
[5]. Iboyaima Laithangbam, "Can hope float Loktak's phumdis?", *The Hindu*, July 15, 2017.
[6]. **Jugindro** Singh (2018): The Ithai Barrage of Manipur: Its Emerging Impacts On Anthropogenic and Ecosystem to the Catchment Areas. IOSR Journal of Humanities and Social Science (IOSR-JHSS) Volume 23, Issue 5, Ver. 6 (May. 2018) PP 67-72.
[7]. Kangla, (2017). https://www.telegraphindia.com/1170921/jsp/northeast/story_174214.jsp (The Telegraph, 20 Sept. 2017)
[8]. R. K. Ranjan Singh (2014): Ithai Barrage: A Fatal Threat To Natural Drainage System Of Manipur Valley, April 21, 2014
[9]. State Remote Sensing Center, Imphal (1990): "Report on Landuse Survey Project of Manipur, Directorate of Science, Technology and Environment, Govt, of Manipur".
[10]. The Sangai Express,"Loktak, only notified water body in State:Over 200 water bodies vanish", *E-Pao,*November*18,* 2011.
[11]. The Imphal Free Press, "Consult indigenous peoples before commissioning mega projects: AHRC

Dr. Kh. Jugindro Singh. "Responsibility to Conserve Natural Resources of Loktak Lake: A Sustainable Development to the Lake Catchment Areas in Manipur." *IOSR Journal of Humanities and Social Science (IOSR-JHSS),* 27(03), 2022, pp. 34-38.