

# **The Ithai Barrage of Manipur: Its Emerging Impacts On Anthropogenic and Ecosystem to the Catchment Areas.**

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**Abstract:** The Ithai Barrage is constructed at the confluence of the Imphal River and Khuga River near Ithai village under Bishnupur District. The purpose of the barrage was primarily to act as a barrier and create an artificial water reservoir to provide regulated storage for power generation to generate 105 MW of power supply and lift irrigation to the Loktak hydro Project (LHP). The Loktak Multipurpose Hydro Electric Project began under the supervision of the Ministry of Irrigation and Power, Government of India in the year 1971. NHPC has been operating the project ever since it was commissioned in 4<sup>th</sup> June 1983 along with Ithai Barrage. The paper aims to find out the Ithai Barrage and its great devastate victim to the Loktak catchment areas in socio-economic and physiographic condition. After the commissioned of the Ithai Dam (35ft high dam) which is constructed at a height of 768 metres contour line above MSL across the Manipur River, at the confluence of the Khuga River (Tuitha), about 700.00 mts. distance between the Ithai Dam and mouth of Khuga River has becoming devastating to the catchment areas. The study of the present paper based on primary, secondary sources of information/data available from e-sources, Government publications and journals. The study is all about to focus on the impact of Ithai Barrage. The barrage was constructed with the assurance to provide benefit for the people but it is happening in a reverse manner. The solution to save the natural habitat of the state is to decommission the Ithai barrage which has become the main cause of flood in the State and natural water course to keep the environment a sustainable catchment area and save productive agricultural fields.

**Keywords:** Confluence, Reservoir, Catchment Areas, Reverse, Devastated, Decommission

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## **I. INTRODUCTION:**

The construction of the Ithai Dam has brought a reverse picture in economic status of Manipur from a self-sufficient to borrower's position with a large number of agricultural lands submerged under water. Manipur continues to lose fluctuant around 300 crore rupees annually, if one calculates the annual loss of crop yield, fishing and other seasonal vegetable harvest from the land destroyed by Ithai Barrage in and around Loktak wetlands, over 80,000 acres of land. Manipur has incurred a loss of more than 10,500 crores of rupees since the project operation from 1983 onwards. A careful calculation of economic, social and environment impact of Loktak project and the Ithai Dam altogether is a serious and critical need of the hour. With the Ithai Barrage maintaining a constant water level at 768.5 metres above mean sea level, to maintain enough water storage for the hydro project, tremendous changes took place within and in the peripheral catchment of 'Loktak Lake'. The drastic changes in the hydrological regime of the Loktak and its associated river systems caused significant changes in its ecological profile, impacting the natural vegetation, migratory fish and water bird population that thrived upon its resources. With the natural cycle of water flow abruptly broken due to the passage blocked at the Ithai Dam; migratory fish population that used to come upstream from the Chindwin-Irrawaddy river system in western Myanmar became a thing of the past within Loktak and the adjoining water bodies. Fishing was the backbone of rural economy of the people settled within and around the Loktak Lake. The loss of this fish resource has been a big blow for the native fishermen and economy of the state.

## **II. SOCIO-ECONOMIC STATUS OF ITHAI BARRAGE:**

The Ithai Barrage, for power generation, has been constructed at an un-strategic and unscientific point of the Manipur River, i.e. after the confluence of the Manipur and the Khuga rivers so as to devastate the future of the generations of Manipur. The project aims to generate sufficient electricity and irrigate extensive agricultural land in the state, has adversely affected the eco-system of Loktak Lake and has also flooded land in the valley districts of Manipur. The Impact of Ithai Barrage is not limited to only submergence of agriculture land and destroying peoples' livelihood. The Ithai Barrage has been responsible for series of floods in Manipur

as the NHPC in several occasion, refuse to open the sluice gates of Ithai Barrage, leading to widespread submergence of agricultural areas and imbalance the Lake ecosystem. The proposed command area to irrigate 24,000 hectares through Loktak Lift Irrigation under the NHPC Loktak Project, drastically falling into 6000 hectares in reality was also acknowledged. Every monsoon season the state has been experiencing flood the Loktak periphery lands. The state already experienced more than five major flood havocs from April till July 2017 and lost lives and much affect to economy by damages crops in the agricultural fields and fish firms. Before construction of Ithai Barrage, indigenous air breathing fishes like *Anabas testudineus*, *Channa punctatus*, *C. striatus* and *Clarius batracus* were dominant fish species (Chaudhury and Banerjee, 1965). Annandale *et al.* (1921) found abundant fish in the Loktak Lake. While reporting on fishes of the Manipur, Hora (1921) and Menon (1954) included fish fauna of the lake. Recently, Romi Singh (2002) reported a total of 54 fish species representing 18 families and categorized under 3 groups viz., Endangered (6 species), Vulnerable (14 species) and Exotic (7 species). Trisal and Manihar (2004) pointed out that 12 fish species earlier reported by Tombi Singh and Shyamananda Singh (1994) were not observed and an exotic catfish *Clarias gariepinus* and a riverine species *Aplocheilus panchax* were recorded in the lake for the first time. At present many migratory fishes are disappearing from the lake due to the construction of Ithai barrage and deterioration of water quality. Some of the important fish species which used to migrate to the lake from the Chindwin-Irrawaddy river of Myanmar along the Manipur river for breeding and spawning purposes. Acknowledging the role of Ithai Barrage in the worsening flood situation in Manipur, the Chief Minister of Manipur, Mr. Biren has even requested Mr. Narendra Modi, Prime Minister of India in July 2017 to remove the Ithai Barrage that blocks the Manipur River. Unleashing environmental impacts, the Ithai Barrage also led to disappearance of several indigenous fishes from Loktak Lake such as the Ngaton, Khabak, Pengba, Tharaak, Ngaaraa, Ngaatin etc. The production of at least Twenty Three (23) indigenous varieties of aquatic edible plants, e.g Heikak, Thaangjing, Loklei, and Pulei etc has been reduced.



Photo-2: Floating grass (*Phumdis*) deposited in front of the Barrage  
Photo: (source: ANI/YouTube video capture)

#### **Physical Feature of the Ithai Barrage and Catchment area of Loktak Lake:**

Elevation of Loktak Lake is 768 mts. (2,520 ft) AMSL; Elevation of the Ithai Barrage site: 777.84 mts (2,552 ft) AMSL; Difference between Loktak Lake water level and height of the Barrage is 9.75 mts (31ft.11 inches); higher than Loktak Lake water level.

Water level of Ithai barrage and Loktak catchment areas:

Sl. No	Station (Location)	Altitude Elevation from AMSL)	Sl. No	Station(Location)	Altitude (Elevation from AMSL)
1	Athokpam	2,54 ft. (773 m)	18	Niyanglam	2,54 ft.(773 m)
2	Hiyangthang	2,54ft (773 m)	19	Nongmaikhong	2,524 ft. (769 m)
3	Hungoon	2,54 ft.(772.3m).	20	Phoubakchao	2,54ft. (773.9 m)
4	<b>Ithai</b>	<b>2,55 ft.(777. 84 m)</b>	21	Phubala	2,53ft. (772 m)
5	Keibul Lamjao	2,52 ft.(769,1m)	22	Samurou	2,53 ft. (770 m)
6	Keinou	2,54 ft. (773 m)	23	Sangaiyumpham	2,54 ft.(773 m)

7	Khangabok	2,54 ft.(773 m)	24	Sekmaijin	2,54 ft.(775.5 m)
8	Komlakhong	2,53 ft.(769.9m)	25	Tentha	253 ft.(772 m)
9	Laphupat Tera	2,54 ft.(772.8 m)	26	Thinungei	2,58 ft.(773 m)
10	Leishangthem	2,54 ft.(775.1 m)	27	Thongam	2,54ft. (773 m)
11	<b>Loktak</b>	<b>2,52 ft. (768 m)</b>	28	Thongjao	253 ft.(772 m)
12	Mayang Imphal	2,52 ft.(769 m)	29	Toubul	2,54 ft. (776.6m)
13	Moirang	2,53 ft.(779.1m).	30	Uchiwa	2,52 ft.(772.1m)
14	Mojjing	2,54 ft.(774.2 m)	31	Utlou	2,53 ft. (770 m)
15	Nambol	253 ft.(771 m)	32	Wabgai	2,53 ft. (770 m)
16	Ningthoukhong	2,54ft. (774.8 m)	33	Waikhong	2,53 ft. (772 m)
17	Ningombam (TBL)	2,539 ft.(774 m)	34	Yumnam Huidrom	2,53 ft. (771 m)

Source: Calculated from Google Map.

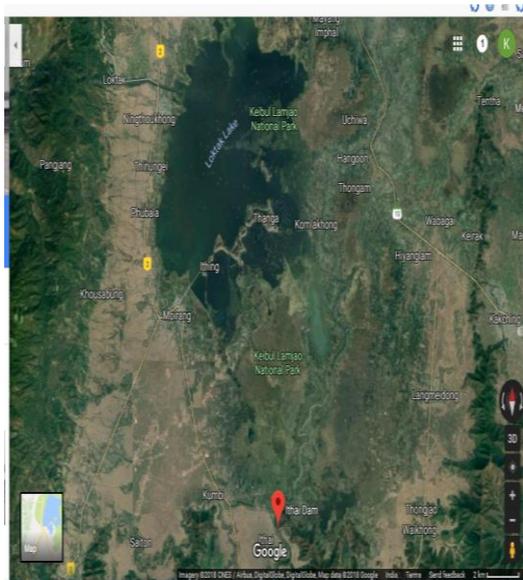
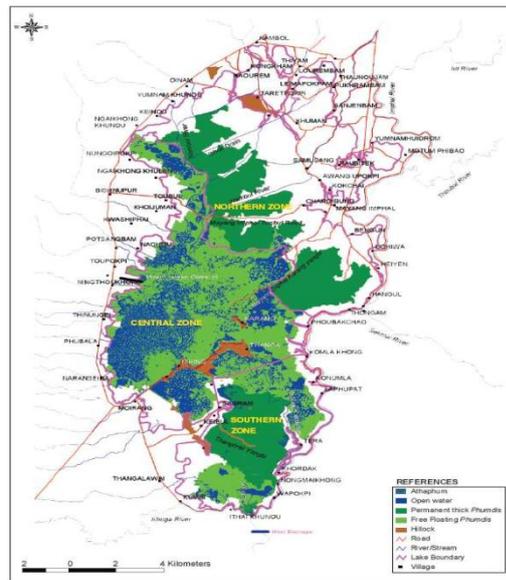


Photo-2: Sattelite picture of Loktak Lake



Area of Phumthi in Loktak Lake – 2002

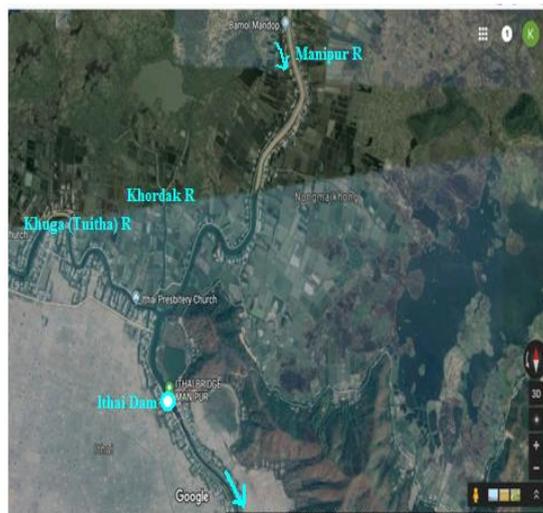


Photo-3: Manipur, Khordak and Tuitha River channels

### III. IMPACT ON THE SOCIO-ECONOMIC CONDITIONS:

#### 3.1 Submergence of productive fields and settlement areas:

The Ithai barrage constructed as part of the Loktak HEP has already become a major problem for the socio economic life and environment of Manipur, threatening the very survival of the valley as a viable and sustainable ecosystem (Kamei, 1993). It is estimated that about 83,450 hectares of agricultural lands of both sides of Ithai Dam have been affected. More problems affected to the Loktak and its surrounding low lying

paddy and fish farms is the installing of the Khordak Dam ahead of confluence to the Manipur River deciphers the symbolic significance of Khordak joining the Manipur river's course; the damming of which disrupt and block the natural inflow and outflow of water. The Ithai Barrage blocked not only *Khuga River* but it also manipulates the inlet and outlet natural water flows from Ungamen *Maril*, and Khordak *Maril* (river). The practice of keeping water level of the barrage at 769 meters above the mean sea level whereas the altitude of normal water level of the Loktak lake and surrounding catchment area is the prime causes of frequent floods at both the upstream and downstream areas and submerges vast productive paddy fields. The project which aims to generate 103 MW of electricity and irrigate 24,000 hectares of land has adversely affected the eco-system of Loktak Lake and has also led to a negative shift in the natural cycle of the phumdis which is the only home for Sangai, the rare indigenous animal in the world.

### **3.2 Connivance of NHPC:**

The NHPC, fully aware of the extent of the damages inflicted to the indigenous peoples has failed to take any action for preventing such damages or rehabilitating the affected indigenous peoples since the commissioning of the project in 1984. The NHPC earns huge profits while depriving affected indigenous peoples and in disregard of the traditional ownership, enjoyment and possession of their respective paddy fields and homesteads arising directly out of the operation of the Loktak Hydro Electric Project (High Court, 1994). NHPC undermines people's voice, that's their major mistake. They are too unresponsive, or should it be interpreted as high headedness.

### **3.3 Diminishing of Indigenous flora and fauna species:**

It is true that, after commissioning of the Ithai Barrage, Several indigenous fishes have disappeared from Loktak Lake such as the Ngaton, Khabak, Pengba, Tharaak, Ngaaraa, Ngaatin, etc due to Ithai Dam. It has been observed that these fishes migrated from the Chindwin-Irrawady river system of Myanmar to the course of Imphal/Manipur River for breeding in the adjoining lakes and streams of Manipur valley. The increase in the water level of Loktak due to Ithai Dam has caused a great damage to the production of aquatic plants of food which are 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.

### **3.4 Pollution:**

The Loktak Lake is receiving pollutants from both organ chlorine pesticides and insecticides from the surrounding agricultural fields. Due to block the natural water flow at Ithai barrage, such contaminated polluted water storage and moreover fishermen in the Lake frequently pouring pesticides and insecticides to catch fish. This also enhances the process of pollution in the lake. Nitrates can be converted in the human digestive tract by certain bacteria to nitrites. Nitrites when react with haemoglobin in the blood, the ability of the latter to take up oxygen is greatly reduced (Verma and Agarwal, 1987). The lake also receives huge amount of polythene and other waste plastic items from the human settlements other than siltation. The mouth of Nambul river in the lake is often piled-up with huge quantity of plastic wastes and broken glasses. These substances are non-biodegradable in nature and create numerous problems in the lake ecosystem.

### **3.5 Increasing Floods:**

Damming at Ithai has also slowed down the current of flow of water leading to greater deposit of debris into the river bed and the lake. The Ithai Barrage has been responsible for series of floods in Manipur as the NHPC in several occasions; refuse to open the sluice gates of Ithai Barrage, leading to widespread submergence of agricultural areas. Before the construction of Ithai Barrage, the Khordak channel functioned as both the inlet and outlet channel and hence there was no possibility of depositing much debris. From times immemorial, the flow of river water was controlled by the Sugnu Hump and also that the Chakpi River played the consequent role in a natural process. But all these natural courses have now become defunct because of the Ithai Barrage, posing a severe ecological threat to the lake and surrounding areas.

## **IV. PUBLIC AND GOVERNMENT OPINION ABOUT THE ITHAI BARRAGE:**

The project has invited severe criticism since the water level in the lake at the Ithai barrage is maintained throughout the year at Filter(shut off) Regulator (handle of the regulator) Lubricant (FRL)786.5 m (2,580 ft) from considerations of power generation from the well planned water conductor system. Over the years, NHPC's hydropower projects specially Ithai Barrage have led to severe impact on the lake eco-system and serious disturbance in local community. Despite this, NHPC has been pushing more hydro projects on the

lake streams. As a result, local people and concerned have univocally and repeatedly started protesting against proposed hydro projects and demanding removal of Ithai barrage. And the demand has only grown louder in 2017. In most important development, in August 2017 Chief Minister N. Biren Singh urged Prime Minister Narendra Modi to review the Loktak Project as a permanent solution for frequent floods in the State. The Ithai dam has become the main cause of flood in the State and in needs to be removed. The Governor of Manipur, Dr Najma Heptulla observed that the commissioning of the barrage has posed a serious threat to the ecological balance of the State, particularly to Loktak Lake and its surrounding areas and therefore pursue the Central Government to decommission the Ithai Barrage in order to maintain ecological balance in the State (Press, 2017). The Loktak project was taken up long before only to get some power but now the State is having sufficient power. The barrage was also held responsible for recurring floods and damage to biodiversity in upstream and downstream of it. The total damages inflicted by the recent floods in Manipur has been estimated at Rs 223.83 crore which has been further increased to Rs 358.23 crore while a total of 78,677 hectares of agricultural land including 77,900 hectares of paddy, 307 hectares of maize, 300 hectares of pulses, 150 hectares of oil seed and 20 hectares of sugarcane have been damaged and 25 persons also lost their lives (Mirror, 2017).

#### **V. DECOMMISSIONING A DAM:**

As far as concerned, Decommissioning of dams in India is indeed rare because of safety or environmental concerns. Internationally, though, decommissioning of dams is a fairly common practice. In the United States of America, more than 900 dams have been torn down since 1980. France, too, has seen quite a few dams being decommissioned recently. In the rest of Europe also, thousands of dams are being put through a review process. Among Asian nations, Japan is currently in the middle of bringing down its Arase Dam located upstream on the Kuma River. In India, the Central Water Commission (CWC) doesn't want the word decommissioning to enter the vocabulary of water resources management in the country.

#### **VI. RECOMMENDATION:**

Things have become from worse to worst because of the ill-conceived planning of projects in Manipur, in the pretext of so-called 'Development'. The Ithai Barrage, for power generation, has been constructed at an un-strategic and unscientific point of the Manipur River. In the earlier, when starting the project common people settled in and around the peripheral areas of Loktak, hoping that the completion of the Loktak Multipurpose Project (LMP) would boost their living standard and economic conditions. Unfortunately, now the facts are reverse and hopeless to innocent people.. Ithai barrage which has become the main cause of flood in the State should be removed and natural water course should be maintained.

#### **VII. CONCLUSION**

There is a larger question if the operation of Loktak Project with an annual loss of more than 300 Crore for Manipur is still feasible? Moreover, North East India is already power surplus and people of Manipur buy power irrespective of where it is generated. The Manipur Loktak Lake Protection Act, 2006 should also be repealed to recognize the rights and role of fishing communities in the sustainable management of Loktak wetlands. NHPC should be held accountable for the multiple violations unleashed in Manipur. A development process that inflicted suffering to the communities and that devastate their livelihood and that insisted on corporatization and perception of land and resources only as sources of profit amidst absence of any accountability mechanism for corporations and the State can never lead to sustainable development. In recent years, the diversity and population of migratory birds and fishes has declined during due to poaching, over-exploitation and changes in ecological characteristics of the wetland. LDA and WISA (2004) reported that several plant species which are preferred food plant of Sangai, has now become extremely rare. The habitat of Sangai deer in KLNPN is also threatened due to thinning of *phumdis*. Similarly, indiscriminate fishing practices without strict imposition on mesh size, especially during breeding season leads to further decline in the diversity and production of fishes in the lake. LDA and WISA (2008) reported 12 fish species earlier reported by the workers were not observed in their recent studies. The populations of migratory and resident waterfowl have declined during the last few decades. Today, the people of the villages directly affected by Ithai-Barrage have become volatile above the grave danger to their existence. The people of Manipur can live better without the Loktak Project. But we cannot develop without the Loktak. The Loktak Hydro Electric Project and Ithai dam have been disastrous projects and they must be decommissioned.

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