Manipur News Articles compilation
by ICSF
Manipur: Declining rainfall turns paddy fields into fish farms


On account of the declining annual rainfall in the State, a number of paddy fields where double cropping was done have been converted into fish farms. The average rainfall rate was 1473.9 mm in a year but the rainfall rate has been declining since a few years back. As a result, a number of paddy fields where paddy was cultivated twice a year are being converted to fish farms. Compelled by the pervasive impact of climate change, large tracts of paddy fields located on the eastern side of Loktak Lake along Mayai Lambi are being converted into fish farms. One Sarangthem Inaoba (44) of Yumnam Huidrom said that a number of paddy fields have been converted to fish farms as the seasonal rainfall was quite unpredictable and inadequate during the past five years or so. Like many other farmers, Sarangthem Inaoba was seen making a fish farm out of his Mayang Imphal paddy field.

Even though paddy is still cultivated in paddy fields located close to Loktak Lake as water is available from the lake, large tracts of paddy fields located further off the lake at Paobitek, Yumnam Khunou, Chirai, Chabung Company, Konchak and Mayang Imphal are being converted into fish farms. While fish ponds have been dug in a considerable number of paddy fields, there are many paddy fields which remain dry and uncultivated. Fish ponds which are dug anew must wait for seasonal rainfall before they can be used for rearing fish. One Sitara Begum (40) of Wangoi Paobitek said that paddy is no longer cultivated in a large number of paddy fields since the last 10 years. Some farmers did cultivate paddy but the paddy plants were flooded and completely destroyed for three consecutive seasons. Sitara said that large cracks have surfaced on her paddy field but there is no source of water to irrigate the dry paddy field. She said that the nearby river and canals have all dried up. Unique Wildlife Protection Committee, Sekmaijin member Budha Elangbam said that many farmers have been able to earn more after converting their paddy fields into fish farms.

Cultivation of paddy over one Sangam could earn Rs 20,000 to Rs 30,000 in a year but if one Sangam of paddy field is converted into a fish farm, a farmer can earn over Rs three lakh in a year, he said. ICAR Imphal’s Agrometrology Advisory Services Nodal Officer Dr Irengbam Meghachandra said that the impacts of global climate change have already reached the State. The thunderstorms which swept across the State recently in which three people were killed was one phenomenon of the global climate change, he said. Felling of trees has been adding more destructive power to cyclones and windstorms as they face little obstruction on their way in the absence of trees, Meghachandra. Even though the average rainfall rate has been declining in the State, many parts of the State faced floods as there was excessive rainfall during certain months of the year.
In January this year, the State received 3.4 mm of rainfall against the expected or normal rate of 13.5 mm. The corresponding figures for the months of February March and April are 20.3 mm against 40.9 mm, 36 mm against 75.9 mm and 70.1 mm against 123.4 mm. As the rainfall rate is quite inadequate, paddy seeds on jhum fields are unable to germinate. Likewise, many paddy fields in the first phase are not yet fit for first phase of paddy cultivation, he said. Farmers need to understand the climatic changes before the situation grows worse and there is an urgent need to expedite afforestation activities, said the Nodal Officer.

To avoid drought or drought like situation, small dams must be constructed at different places across rivers flowing down from hills. It would be more beneficial if fishes are reared in the water held up by these small dams, he added. Directorate of Environment’s Climate Change Nodal Officer T Brajakumar said that conversion of dry paddy fields into fish farms is a traditional practice aimed at adapting to climate change and the same was done by farmers in the past too. Nonetheless, the departments concerned need to support the farmers’ initiative to rear fish in place of cultivating paddy by providing technical inputs so that their initiative is more productive, Brajakumar said. He also underscored the growing importance of harvesting rain water.

**Manipur: Climate change hits hard fishing community of Loktak Lake island**


The fishing community of Karang which is India’s first cashless island located in the middle of Loktak lake in Manipur is still facing various forms of hardship due to climate change and factors relating to the commissioning of the Loktak Project in the eighties, according to the villager elders. The villagers who buy everything except water in their daily life, also claimed to have spotted a new kind of unknown aquatic insects around the island in the recent past besides experiencing rise of mosquito population. This was shared by some of the elders and local club functionaries of Karang, a picturesque lake island located in the middle of the Loktak which is the largest freshwater lake in north east India when a team of journalists working in different districts of Manipur visited the island last week.

The journalists’ team visited the Island which was named as the first cashless island in India by the Union Ministry of Electronic and Information technology under its Digital India Programme in January 2017, as part of two day media workshop on climate change reporting organized by the Khelen Thokchom Trust in association with the Directorate of Environment and Centre for Media Studies, Delhi. “The environment around Karang has been changed and it directly and indirectly affects livelihood of the villagers after the commissioning of the Loktak Project,” says a village elder. Sharing a similar sentiment, president S Kheda of Karang Island Development Organisation (KIDO) said that the normal income of the fishing community of the island has also
been declined and affects the school education and subsequently the school drop out rate is on the rise in the last few years. “So now the government needs to take up some development schemes for the fishing community of the island and others around the lake,” he said.

Citing degradation of the lake environment and various forms of fishing activities in the lake, he said, adding, “Unlike the past, the villagers cannot earn much.” Earlier a fisherman usually earns around Rs 500 by selling fish and aquatic plants available in the lake on a daily basis. In view of the development, the villagers particularly the younger generation of this picturesque lake island located about a two-hour drive from Imphal including boat ride expressed their desire to have certain development programmes including the skill development for the improvement of their livelihood through eco-tourism activities and others to overcome the challenges which are being faced by the villagers. Karang is inhabited by about 3,000 villagers, according to KIDO.

**Manipur: State needs average fish production of 3,000 kg/ha to be self sufficient: Expert**

http://e-pao.net/GP.asp?src=19..160319.mar19

A three day training programme on skill development and capacity building in fisheries sector for fish farmers, entrepreneurs from Imphal West district started yesterday at the Training hall of Directorate of Fisheries, Lamphel. The programme on the topic "Advance Fish Culture Practices for enhancing fish production" organised by Department of Fisheries, Manipur under the sponsorship of National Fisheries Development Board (NFDB), Hyderabad was attended by Bidyarani Ayekpam, Director Fisheries, Manipur as chief guest and Dr RK Saha, Director (Extension) CAU, Lamphel and Dr Ch Basudha Devi, Senior Scientist (Fishery), ICAR for NEH Region, Lamphel as guests of honour respectively. Speaking at the event, Dr RK Saha said that even though the potential is very high, the State is yet to meet the per capita consumption requirement.

The Directorate of Extension Education, Central Agricultural University (CAU), lamphel has received fund from the NFDB for setting up Aquatic Animal Health Laboratory, which will help the State farmers to identify fish disease, test soil and water quality etc, he said. He appreciated the Director of Fisheries for installing a fish feed mill in Imphal, which he said will help increase fish production. Senior Scientist, Dr Ch Basudha said that skill development and training programme for the farmers are very important for exchange of scientific technology. The average fish production of State is less than 1,000 kg/ha whereas in Andhra Pradesh it is more than 7,000 kg/ha, she said. The State needs to produce an average of 3,000 kg/ha to be self sufficient, she added. Director of Fisheries, Bidyarani Ayekpam said that the State has high fish production potential.

The department is giving due importance to augment the gap between production and requirement of the State. Even if the State Government and Centre give financial assistance in the form of subsidy or grants to the fish farmers, it will not be materialized unless the farmers
take the initiative to utilize the resources, she said and encouraged the farmers to culture high priced and high yielding species of fishes to generate more income. Fishery specialists from ICAR, KVKs and experts from other institutes attended the programme. 55 fish farmers from Imphal West district are attending the training programme.

**Manipur: Banks are providing loans to 239 fish farmers**


Out of Rs 7,97,80,608 sanctioned for the State under Ayushman Bharat scheme for 2018-19, Rs 2,58,80,329 has been spent. Against, 56,728 people who applied for the scheme, medical assistance has been given to 1,109 beneficiaries, Jayantakumar said in response to a query raised by O Henry. Replying to another question raised by Surjakumar, Fishery Minister N Kayisii said that the total annual fish requirement of the State is 52,000 metric tonnes and the State’s total annual fish production is 32,000 metric tonnes. As such, the gap of 20,000 metric tonnes are imported from outside the State and its total cost may be around Rs 400 crore, Kayisii said. With a view to make the State self-reliant in fish production by 2020, the State Government has constituted the Manipur State Fisheries Development Technical Committee. At the recommendation of the State Government, banks have given loans to 239 fish farmers against 2871 fish farmers who applied for similar loans. Machinery required for setting up a fish feed mill in Imphal West will arrive in the State within the next couple of days, Kayisii added.

**Manipur: Steps on to achieve self sufficiency in fish production by 2020**


Manipur government has taken up various steps to achieve self sufficiency in fish production by 2020, the state fisheries minister N Kayisii said. A committee under the banner Manipur state fisheries development technical committee initiated by the state chief minister N Biren Singh has been constituted in this regard. All banks operating in the State were invited to extend financial help in terms of loans to fish farmers in the State, minister Kayisii said while responding to a question by opposition Congress MLA Surjakumar Okram of Khangabok Assembly constituency in Thoubal district during Assembly session on Saturday. So far, a total of 239 loans out of 2871 applicants were sanctioned as the first phase as on February 8 this year, he said. A fish feed mill plant is being established at government fish farm Imphal west district for producing quality fish feed at affordable price.

He also informed that 18 fish farms will be opened in 10 districts of the State following the guidelines of the Central scheme. He assured the House that a Cabinet memo will be prepared for regularisation of the 87 contract employees of the Fisheries Department and it will be put up
for Cabinet decision. Opposition members K Meghachandra of Wangkhem and P Brojen Singh of Wangjing Tentha constituency moved policy cut on fishery department in the day’s session. Participating in the demand discussion, leader of the House and chief minister N Biren Singh informed the House that as a measure to increase the fish production in the State, the Government has identified suitable areas for fish farming at Moirang, Oinam, Bishnupur, Wangoi, Konthoujam and Lamshang.

He said that the officials of Fisheries Department have met the fish farmers of the concerned areas and has tied up with banks to provide timely loans to the beneficiaries. Stating that 2,871 fish farmers applied for the fish loan, he informed that 239 beneficiaries were provided fish loan. Informing the House that the Government will prohibit fishing during breeding season of the fishes, he said that various types of fish culture will be adopted to increase the fish production in the State. He said the department has procured fish feed machine which will help to manufacture fish feeds within the State. Noting the importance of high consumption of Ngari (fermented fish) in the State, he said that the State needs to focus on large scale production of phabou-nga (Puntius chola) which is used in making fermented fish and noted that the import of the particular fish from outside the State poses threat on health.

**Manipur: ICAR and Fisheries Department push for improving fish production**


ICAR-Central Inland Fisheries Research Institute, Barrackpore, Kolkata, organized an interactive workshop on 'Openwater Fisheries Management of Manipur' in collaboration with Directorate of Fisheries, Department of Fisheries, Manipur today at the conference hall of the Directorate of Fisheries, Lamphelpat. The objective of the workshop was to share vast works and achievements of ICAR-CIFRI in managing and enhancing fisheries in large waterbodies, especially in reservoirs and wetlands of the country and how to plan and implement similar activities in the State of Manipur. The major focus was on simple and low-cost technologies (such as pen and cage aquaculture) and guidelines (fish stock enhancement) that are to be popularized in reservoirs, large lakes, swampy areas and rivers of the State for improving fish production.

Fish forms an important food item for the people of Manipur with more than 95 percent of the State's population being fish eaters. The present level of fish production in the State is 32,000 tonnes (2016-17) as against the total requirement of about 52,000 tonnes of fish, showing a shortfall of about 20,000 tonnes. This shortage is partly met by importing fish from other States. Manipur has got a production potential of about 65,000 tonnes of fish per annum. For harnessing this, sustainable utilization of available inland fisheries resources and application of modern scientific fisheries management protocol, including enclosure aquaculture techniques developed by ICAR-CIFRI, needs to be implemented. Manipur has unique, vast and varied inland fisheries resources comprising of 30,171 hectares of natural lakes/flood plain wetlands, 13,888 hectares of
Inland openwater fisheries resources such as lakes, rivers and reservoirs are largely un-exploited and have high potential for increasing fish production from them. The major theme of the workshop is dissemination the knowledge generated by ICAR-CIFRI for development of inland fisheries in the State of Manipur without compromising ecosystem and environmental sustainability. During the inaugural session, Dr Sona Yengkokpam, Scientist, ICAR-CIFRI Regional Centre, Guwahati, welcomed the invitees, guests and 50 participants from the Department of Fisheries, Manipur. Dr BK Das, Director, ICAR-CIFRI, Barrackpore and convener of the workshop, emphasized that the Department of Fisheries, Manipur, should look into diversification of fish species having local preferences.

He assured all support in terms of technology back stopping for management of open water fisheries in the State. Khamsing Ahum, Additional Director of Fisheries, Manipur urged his Departmental officials to take full advantage of the knowledge generated by ICAR-CIFRI on management of Inland open waters. Dr AK Das, Principal Scientist, ICAR-CIFRI, Barrackpore, expressed his optimism that food fish demand and supply gap of Manipur can be minimized if inland openwaters of the State are optimally utilized. In the Technical session of the workshop, Dr BK Das discussed management of openwaters of India by ICAR-CIFRI and encouraged the Departmental officials to take interest in developing openwaters of the State. He also shared his vast experience in cage aquaculture across different reservoirs and wetlands of India.

Khamsing Ahum presented the status of openwater fisheries resources of Manipur, Dr Sona Yengkokpam discussed pen aquaculture demonstrations and experiments done in different NE States, which proved to be successful in terms of economic viability and Dr Dipesh Debnath, Scientist, ICAR-CIFRI, RC. Guwahati, discussed cage aquaculture demonstrations and experiments done in different NE States, that can be replicated in Manipur. In the valedictory session, Bidyarani Ayekpam, Director of Fisheries, Manipur thanked Dr BK Das, Director, ICAR-CIFRI and all the scientists of the ICAR-CIFRI for organizing the workshop at Imphal and sought active collaboration and support in future endeavours of the Directorate of Fisheries, Manipur.

**Manipur: Wetlands Day: Tapping methane gas from Loktak Lake under study**


State Wetland Authority, Manipur, convener Dr T Brajakumar has conveyed that the State Wetland Authority is planning to conduct a scientific study for tapping methane gas from Loktak Lake. Speaking at the World Wetlands Day Observation under the theme "Loktak Lake for Our Future Generations" which was organized by All Loktak Lake Areas Fisherian Union Manipur (ALLAFUM) at Langolsabi Champu Khangpok Floating Village, Loktak today, Brajakumar
(who is also the Deputy Director of Department of Environment, Manipur) went on to inform that sophisticated tools for conducting the scientific study have already been ordered from outside the State and it (the scientific study) will be initiated once the tools reach the State. If the scientific study is a success, the tapped/extracted methane gas from Loktak Lake can be used for many useful purposes, he added.

Stating that the Central Government had approved the State Government's proposed project for cleaning solid waste from Nambul River and that the said work will begin this year, the convener exuded confidence that pollution level at Loktak Lake will be minimized to a great extent if the said project is completed. Reminding that World Wetlands Day is celebrated on February 2 every year under different themes to mark the date of adoption of the Convention on Wetlands on February 2, 1971, in the Iranian city of Ramsar, Brajakumar also highlighted that this year's theme for the observation of World Wetlands Day is "Wetlands and Climate Change". INTACH, Manipur Chapter Convener Dr RK Ranjan opined that the condition of Loktak Lake has changed immensely compared to the past. He further pointed out that the number of migratory birds coming to Loktak Lake has drastically declined in the last few years while informing that British environmentalist Humes had given an account of finding more than 30,000 birds and a large number of species in the same lake, during the 1930s.

The commissioning of the Loktak Hydro Electricity Power Project and Ithai Barrage project have led to immense and adverse impacts to Loktak Lake as well as to its surrounding villages causing the disappearance of many indigenous fish species/varieties apart from submerging large areas of cultivable lands/paddy fields in the surrounding villages, he said. While maintaining that Manipur no longer has food security due to extinction of cultivable lands, he also contended that demanding right to food security will be quite beneficial towards the conservation of Loktak Lake. He then observed that the proposal for construction of ring roads nearby Loktak Lake will amount to destruction of the lake's ecosystem. ALLAFUM advisor Kh Ibochou said that the Government has not attended to the issue of ever increasing siltation in Loktak Lake due to draining of solid waste materials from major rivers like Nambul River.

He continued that the Government has been putting efforts on cleaning useful phumdis but the unwanted phumdis have not been cleared. Saying that the Government is introducing mechanized boats in the name of developing Inland Waterways Transport System at Loktak Lake, the advisor noted that mechanized boats emit lots of oily residues which will increase the pollution level. Noting that Loktak Lake is providing a source of livelihood for many fishermen apart from being a prestigious natural gift to all Manipuris, Ibochou asserted that the World Wetlands Day observation was organized with the main objective of preserving Loktak Lake. Imphal Free Press Editor Pradeep Phanjoubam, MU Professor W Vishwanath and Green Foundation member Thiyam Rinita, among others, also attended the function as presidium members.
Manipur: Protest against proposed bird sanctuary in Manipur


The Manipur government’s plan to set up a bird sanctuary at the Loktak lake in Bishnupur district has met with stiff opposition from the villagers in nearby areas. A large number of residents of Thingnunnggei village took out a massive procession against the government’s proposal on Sunday. “The villagers of Thingnunnggei are poor and they have no other means of earning a livelihood except for catching fish and plucking vegetables from the lake. If fishing is banned in the lake, the villagers would starve. We are all for protection of birds, most of whom are migratory, but the new scheme should not be implemented at the cost of the poor villagers,” said one of the protesters. Declining number Thousands of migratory birds flock to the Loktak lake, the largest freshwater lake in north-eastern India, every year. However, in the past few years there has been a sharp decline in the number of migratory birds coming to the lake. Reports indicate that bird poachers are active in the area, targeting the winged guests. Officials of the forest department's wildlife wing say in view of the widespread bird poaching at the lake, setting up of the sanctuary is a must. Birdwatchers on the other hand blame human intrusion, bird poaching and hydroelectric power project near the lake for the decline in the number of migratory birds and brow-antlered deer in the Keibul Lamjao national park in the vicinity. Brow-antlered deer Some decades ago, the villagers of the lake islets had agitated against setting up of the Keibul Lamjao National Park, the natural habitat of the endangered brow-antlered deer. They wanted the land demarcated for the park to be made available to them for cultivating paddy. Now, several years later, the latest census suggests that there are only 260 brow-antlered deer in the Keibul Lamjao national park.

Manipur: Fishing for a life and livelihood in Loktak


Fisherfolk dwelling on this unique Manipur lake face many challenges, including a dwindling catch Neighbours Ibohal and Babu, who live on Manipur’s Loktak lake, are pulling their phum-shang (meaning dwelling in the local language) towards a new area. Their wives are helping them in the task. They are being forced to do this as the fish around their habitat has started to dwindle, so it is better to move towards an area where they feel they will find more fish and other edible water plants. Phum means floating biomass and shang means hut. These phum-shangs are small huts of fishermen families built upon the floating biomass of Loktak lake. Moirang, where the lake is situated, is about 40 km on the southern side of Imphal, the capital of Manipur. The lake stretches to about 287 sq km in surface area and for centuries, families have lived on the biomass area that roughly covers 30 sq ft of the lake.
Families here are primarily fisherfolk, whose sole livelihood is catching fish — the harvest of the lake. But things seem to be deteriorating for the lake dwellers. “These days, we really need to make an extra effort to catch fish,” says Ibohal, as he explains the reason for shifting his shang towards a greener pasture. The shifting of the hut includes shifting of the entire biomass on which the hut stands, and this indeed is physically a very challenging job. The phumdi, on which the hut stands, is encircled with a strong rope. The rope is tied and rolled to a pole and pulled on the other end of the rope towards whichever direction it has to be moved. Thus, the phum slowly sways and moves. The movement from one place to another is usually not far, approximately 200 ft. Once this is achieved, the lake dwellers fix their fishing nets in and around the huts and in various places across the lake. In the night, the fisherfolk paddle in their wooden boats through the lake, waiting for the fish.

With lanterns and, in recent times, re-chargeable torches, they remove the catch from the nets and take it early morning to the market to be sold. It is transported across the State and, most importantly, to markets in the Capital city of Imphal. “These days the catch is small” laments Ibohal. “Earlier we used to get good income from selling fish. Nowadays we earn only between Rs. 50 and Rs. 100 a day”. The 63-year-old has been fishing and living on the lake ever since he learnt to catch fish as a child while assisting elders in the family. Hit by eco degradation, evictions But life has become even more hard than before. That could, perhaps, be one reason why a fisherman like Biren has turned his shang-hut into a cosy, one-room homestay on the lake. “I used to take students or tourists to study or view the lake in my boat, that’s how I realised that a homestay on the lake would be ideal,” he says.

He and his wife are managing the home and going that extra mile to ensure they follow all the green norms regarding waste and plastic. Of late, Loktak lake dwellers face tremendous hardship and challenges. Besides the environmental degradation that is impacting the biodiversity of the lake, and decreasing fish species, the major challenge for them are evictions. Several families have fled the lake due to their dwellings being demolished. Until 2010, there were more than a thousand such dwelling huts on the Loktak. Today, only around 200 shangs remain. “Fortunately, we have not faced any untoward incident so we continue to stay put here,” says Ibohal. Post enactment of the Loktak Protection Act, 2006, by the State government and subsequent court order, eviction of Loktak phum dwellers began in 2011. According to media reports, over 700 huts were dismantled by 2013. Several of those who resisted the move found their huts burned down.

The Act prohibits dwellings on the phumdis on the lake and the dwellers were termed “occupiers”. The Act was purportedly for providing the administration control for the protection, improvement, conservation and development of the natural environment of the lake. Babu, Ibohal and Biren say that the huge Ithai dam construction has caused tremendous rise in the level of water in the lake and this has also impacted the fish population. If you try to speak to the dwellers on the evictions, you are met with a studied silence. They have escaped it and want to
be left alone. And that is not surprising, as the unique and picturesque Loktak is the only freshwater waterbody in the entire North-East of the country. The traditional fishing community has lived for centuries on the floating biomass with the lake’s natural resources as its main source of sustenance. Considering its ecological status and biodiversity value, the lake was designated as a wetland of international importance under the Ramsar Convention in 1990.

**Manipur: Government Mulls Road Map to Boost Fish Production**


In a bid to boost fish production in the State, the Manipur Fisheries department is planning a road map. The road map is aimed at increasing fish production by utilising available natural resources, besides encouraging beels. Speaking at a daylong meet on ‘Innovative approaches for development of freshwater aquaculture in Manipur’ at the ICAR Manipur Centre here on Tuesday, Manipur Chief Minister N Biren Singh said that the State Government has taken a slew of initiatives to promote aquaculture in the State by involving the youths. “We will introduce new schemes for unemployed youths so that they can become self-reliant through fish production,” the Chief Minister said. Participating in the programme, Director Bidyarani said, “We are trying to focus on skill development programmes for fish farmers in order to boost production.”

The meet was organised jointly by the ICAR-Central Institute of Freshwater Aquaculture, Bhubaneshwar, ICAR-Manipur centre, Fisheries department, Manipur, and the Central Agricultural University, Imphal. Additional Chief Secretary MH Khan appealed to scientists of different government institutes to share their inputs for the successful running of fisheries in the State. In his speech, Prof W Vishwanath of the Life Science department of Manipur University highlighted the importance of conservation activities while taking measures to increase fish production in the State. He also underscored the need for integrated farming for better results. Director N Prakash of the ICAR, Northeastern Hill region, Joint Director Dr I Meghachandra of the ICAR, Manipur centre, and Director of Extension Education of the Central Agricultural University, Dr Ratankumar Saha, also attended the programme.

**Manipur: Will become self-sufficient in fish production by 2020: Fisheries Minister**


Manipur Fisheries Minister N. Kayisii said Manipur will strive towards achieving self-sufficiency in fish farming and would discontinue import of fishes from outside the state by 2022. Kayisii was speaking as the chief guest at the Fish Fair-cum- Fish Crop Competition 2018 held at DM College of Arts, Thangmeiband, Imphal Thursday. Of the 52,000 metric tonnes of fish required for consumption in the state only 32,000 metric tons are being produced by the fish
farmers of the state annually while the remaining gap is filled by importing it from other states. Minister Kayisii said that fish farming activities are mainly concentrated in the valley when hill areas have the potential for fish farming. Observing that fish farming can be a great tool to solve unemployment and poverty, he encourages people to take up fish farming.

This year’s fish fair saw a wide participation of fish farmers from all over the state where approximately 90,000 kgs of fishes were put up on sale. Altogether 90 fish stalls from different districts and fish farms including stalls of Fisheries Department, ICAR, CAU and College of Fisheries, were opened. Fish fair cum fish crop competition is being held to facilitate buyers and also to encourage fish farmers by giving marketing facilities. Amom Tiken, general secretary of All Manipur Fish Farming Society Association said that proper growth of fish takes time and aquaculture farmers will have to suffer three years due to the flood that occurred this year.

Noting that 30,000 hectares of land in the state is suitable for the fishery, he said fish from Manipur can be exported rather than import if the fishery department helps the farmers in using the suitable lands for fishery which will, in turn, generate employment in the state too. Tiken further said though water is the most important raw material for fishery, land and a proper market is also very essential for developing it. In June last during a meeting with the fishermen of the state, Chief Minister N. Biren Singh also assured to enhance fish production in the state. He said there is vast scope for fish farming as there are abundant water bodies in the state. He also mooted to set up fish feed factory at an estimated cost of Rs. 1.5 crores in the state soon under the PPP model.

**Manipur: CM launches 'Loktak Livelihood Mission' around 1000 hectares area identified for pisciculture**

[http://e-pao.net/GP.asp?src=1..241018.oct18](http://e-pao.net/GP.asp?src=1..241018.oct18)

To protect the largest Freshwater Lake of the NorthEast India and to provide employment opportunities to fish farmers and youths of the State, Chief Minister Shri N. Biren Singh today launched the Loktak Livelihood Mission. The launching function was held at Ningthoukhong, Bishnupur District today. Speaking as Chief Guest of the function, Chief Minister said that our State is spending of about Rs 400 crores annually for the procurement of fish from outside the State, Chief Minister assured that State would have self sufficient fish production by 2020. Farmers would be encouraged to take up pisciculture, he added. Altogether around 1000 hectares of land have been identified in areas like Mayang Imphal, Bishnupur, Wangoi and Thanga for fish farming, he added. With such cage culture farming, fishes would be matured and can be produced in three months, he added.

Chief Minister spoke elaborately on the harmful effects of fertilizers and other chemicals on human health. He mentioned that prolonged usage of such chemicals and fertilizers are the main cause of various deadly diseases among the people of the State. Mentioning the advantages of
organic fertilizers and vermicompost during farming, Chief Minister said that it will benefit in two ways i.e. cost effective and healthy living. He said that Self Help groups would be formed in villages to prepare vermicompost and other organic fertilizers. Chief Minister said that people of the State want a government that is result oriented and the present government is committed to fulfil the aspirations of the people and wouldn't give any false promises. The government is committed to work at grassroots and uplift the lives of the poor people.

The government has introduced various welfare programmes such as CHMT, CMST, and Start-up Policy etc. Encouraging the farmers and unemployed people of the State to apply Manipur Start-up Policy, Chief Minister said that subsidized loans have been given to hundreds of unemployed youths, entrepreneurs recently. He mentioned that he had sacrificed the rest of his life for the welfare of the people of the State. While delivering his Presidential address, Minister for CAF&PD Shri Karam Shyam said that it is the bounden duty of the people of the State to protect and preserve Loktak Lake. Stressing on the Loktak Livelihood Mission, Minister said that the farmers and unemployed youths should seize the opportunity.

Mentioning various initiatives of the government, Minister said that the Cabinet decision to institute Lok Ayukta in the State is a clear stand of the present government to bring transparency in governance and root out corruption. Minister for Agriculture Shri V.Hangkhanlian, Minister for PHED Shri Losii Dikho, Chairman Manipur Pollution Control Board Shri L.Radakishore, Chairman PDA Shri T.Robindro, Deputy Speaker Shri K.Robindro, Chip Whip, Government of Manipur Shri P.Sharatchandra, MLA Sekmai AC Shri H.Dingo, MLA Yaiskul AC Shri Th.Satyabrata, Former Union Minister Shri Th.Chaoba, Addl. Chief Secretary Dr.Suhel Akhtar, DC and SP Bishnupur and others attended the function.

**Manipur: Impact of the Ithai Barrage on the Environment of Manipur: An Overview**


Ithai barrage was constructed in the downstream of Manipur River (Imphal River) as a part of the National Loktak Multipurpose Hydro-Electric Project, to maintain sufficient water volume in the Loktak Lake by making it a reservoir for maintenance of the project. The construction of the national multipurpose project was taken up by the Ministry of Irrigation and Power in 1971. The project was executed by National Hydro-Electric Power Corporation and commissioned in 1983 at an estimated cost of Rs. 115 crores. It was installed to generate 105 MW of power by 3 units (each producing 35 MW.) and to provide Life Irrigation facilities for 24,000 hectares of land. In fact, the Imphal River is the only outlet of draining water from the central valley of Manipur, since all the rivers, streams and major water bodies in the valley are connected directly or
indirectly through the Loktak Lake, and subsequently drained outside the state joining the Chindwin-Irrawaddy system of Burma.

Hence, 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 and fauna etc. of Manipur central valley in particular and Manipur state in general. It appears that the barrage which was constructed as a part of the Loktak Hydro-Electric Project has now become a major problem for the socio-economic life and environment of Manipur. With the construction of the Ithai barrage and initiation of Loktak Hydro-Electric Project, there have been certain changes in the climatic condition and socio-economic life of the people and environment of Manipur in general. Environmental Impact of Ithai Barrage: A preliminary survey on the environmental impact of the Ithai barrage has revealed certain points of merits and demerits of the project in the socio-economic and cultural life of the people of Manipur along with the changes in the environment of Manipur.

The Merits: With the completion of Ithai barrage and commissioning of the multipurpose project there have been certain environmental changes, benefiting the people of Manipur which are really considered to be the merit points of the project as described below. 1. Preservation of the Lake and Conservation of Water: The retention of constant water level of Loktak to 768.5 above mean sea level, with the help of the Ithai barrage, could be considered as a means for the preservation of the lake. It has stopped the usual practice of land encroachment in the peripheral areas of the lake. It helped in the accumulation of sufficient water volume to supplement water storage and water supply problem of the state, which are related to various environmental problems of the states e.g. flood, drought and buffering the climatic condition of the state. There could be altogether a different scenario of Loktak Lake by now, if we leave the lake to continue the natural process with the increasing siltation and land encroachment in the past 2/3 decades.

The existing areas of Loktak Lake (276 sq. km.) could have been reduced to a great extent by about 50 sq. km. only with an average depth of less than 1 metre if we did not take up the project. 2. Generation of Power: The generation of 105 MW of electrical energy (in 3 phases of 35 MW each) has been a significant contribution of Loktak Lake. Out of the total production of 105 MW only 35 have been used for Manipur state and the rest 70 MW have been sold to other neighbouring states. Thus the state could earn in income of nearly 21-22 crores of Rupees per year (nearly 6 lakh rupees per day) from the power generation of Loktak project. In the year 1991-1992 the project could generate excess amount of energy increasing the income to about Rs. 30 crores in one year thereby increasing the power production by 17.3% over that of the previous year 1990-1991. 3. Irrigation Facilities: In addition to the power generation Loktak Multipurpose Project has been able to provide water for lift irrigation of nearly 25,000 hectares of cultivated land area thereby
giving the facilities for double-cropping in these areas. 4. Employment Opportunities: The initiation of Loktak Hydro-Project has given employment to about 500 people directly as staff of the project itself. Besides, the project has given the opportunity for starting various small scale industries in the rural areas using the power generation to giving employment for at least 2,000 people. 5. Supply of Water for Loktak Down Stream: Besides, the power generation from the Loktak project itself the project will be giving the water supply for the proposed Loktak down Stream Project also which is proposed to produce 96 MW of power supply for the state.

The Demerits: Despite the various merit points of Loktak Project there are several points of demerit for the project affecting the socio-economic and cultural life of the people of Manipur and environment of the state as a whole as described below: 1. Flooding of the Agricultural and Land Surrounding the Lake: One major impact of the Ithai barrage on the environment of Manipur is the flooding of several thousand hectares of agricultural land and around the Loktak Lake. The maintenance of constant water level of Loktak Lake due to the Ithai barrage of the project has flooded the agricultural land around the lake, which were previously utilized for cultivation. It is also reported that certain agricultural areas beyond the Ithai barrage on the other side of Loktak lake is also flooded with the water from Chakpi River since there is no counter current from Imphal river due to the blocks with Ithai barrage (Ibomcha Singh, ‘92).

It is estimated that nearly 20 hec. of agricultural areas have been submerged under the water spread of Loktak Lake due to Ithai barrage. In fact, Ibomcha Singh, (1992) reported an estimate of about 83,450 hac. of agricultural land affected by the Loktak project, and a 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. 2. Damage to the Naturally Fishery of Manipur: A recent survey on the disappearance of several indigenous fishes of Manipur e.g. Ngaton, Khabak, Pengba, Tharak, Ngara, Ngatin, etc. indicated the Ithai barrage as one of the major cause for the disappearance of the fishes and loss of our natural fishery. It has been observed that these fishes migrated from the Chindwin-Irrawady system of Burma to the course of Imphal/Manipur River for breeding in the adjoining lakes and streams of Manipur valley.

In the past, these natural fisheries constituted about 60% of the fish products in the state since the culture fishery was not common in Manipur till 1960. With the construction of Ithai barrage the migratory route of these fishes were blocked and they could not reach the valley and disappeared from our waters. This caused a great loss in our state fishery and economy. 3. Damage to Aquatic Plants of Flood and Commercial Importance: The increase in the water level of Loktak Lake due to Ithai barrage has caused a great damage to the production of aquatic plants of food and commercial importance. As for instance the production of about 23 aquatic food plants e.g. Heikak, Thangjing, Tharo, Thambal, Loklei and Pulei etc. has been significantly reduced due to the failure in the germination and extension of their roots to the bottom soil of the lake.
On the other hand, the water level in the southern part of Manipur river beyond Ithai barrage has been greatly reduced due to the blockade of water flow by Ithai barrage, caused the failure in the growth of ‘Nungsam’ which normally grew on the pebbles under the water current. These also caused a great loss in the economy of our state. Besides the food plants a number of plants of commercial importance like, Tou, Singnut, Imom, Charot etc. of commercial importance have also been disappeared or greatly reduced due to the increase in the water level of Loktak lake. These caused a heavy loss in the state’s economy. 4. Affecting the Ecology of the National Park: The maintenance of constant water level of Loktak Lake due to the Ithai barrage has a serious effect on the ecology and existence of the seriously endangered Brow-Antlered Deer of the floating Wild Life National Park of Keibul Lamjao.

The seasonal floating and sinking of the Phumdies in the National Park which play an important role in the nutritional cycle of the vegetations in the National park has not been possible due to the constant water level of the lake. The vegetations which serve as the food and shelter of the seasonal sinking of the Phumdies to get the nutrients from the bottom soil of the lake. Further, the Phumdies become thinner in the peripheral areas of the park and small factions got detached from the main body of the phumdies thereby decreasing the area of phumdies for existence of the deer. Many deer are also killed when they are carried away along with the Phumdies which get detached from the main mass of phumdi. 5. Increasing Siltation Rate of the Loktak Lake: The blockade of water current in the outlet of Loktak Lake through Imphal River due to Ithai barrage has affected the usual removal of the silt with the current of water from Loktak Lake.

Then it helped in depositing the silts to Loktak Lake itself from different inlets of the catchment areas of the lake. This led to the increase rate of siltation in the lake thereby raising the lake bottom. 6. Increasing Accumulation of Phumdies Inside the Lake: The blockade of water current in the outlet of the Loktak Lake through Imphal River due to Ithai barrage also blocked the floating away and removal of the phumdies from Loktak Lake to Imphal River. This caused the increased mass of phumdies inside the lake itself which covered nearly 75% of the surface of the lake. This is another problem for increasing the water level of the lake due to the floating mass of phumdies of nearly 1-2 metres in thickness. The increasing phumdies have spoiled the normal ecosystem and beauty of the lake.

The removal of these phumdies at least 50% will be very necessary in the management of the lake. 7. Grazing Ground of the Cattle: The peripheral areas of Loktak Lake and several elevated areas inside the lake which was used as the grazing areas inside the lake which was used as the grazing ground of cattle in the past have become inundated due to the maintenance of constant water level of Loktak Lake by Ithai barrage. This caused a great destruction in the grazing grounds of the cattle that cattle rearing and buffalo rearing in the villages in and around Loktak Lake has become difficult. Subsequently, the number of cattle and buffaloes has been reduced to a great extent in the past 5/6 years. 8. Unemployment Problems of the People: With the inundation of peripheral areas of Loktak Lake several thousands of hectares of land could not be
used for agriculture and it caused the loss of the employment opportunities for more than one lakh people.

Apart from the failure in agriculture, cattle’s rearing was also not possible since there is no grazing ground of the people. The indigenous technique of Phoom fishing in Loktak Lake also becomes difficult due to the constant rise of water level in the lake. Hence, the Ithai barrage caused unemployment to more than one lakh people in and around the lake. Conclusion From the observations of our preliminary study on the impact of Ithai barrage on the environment of Manipur it appears that there has been several points of demerits, of Ithai barrage causing serious environmental problems in general especially with regards to agriculture, fishery and socio-economic aspects of the people in the state. These could have been avoided to some extent if we could have taken up an environmental impact assessment of the project before its initiation.

Now, it is expected that the Loktak Development Authority would take up certain management plans as remedial measures with due consideration of the maintenance of the natural ecosystem of the lake as much as practicable. The primary objective of the management plan could be (1) control of flood in the agricultural areas around the lake; (2) to improve the natural fishery and fish production of the lake; (3) to retain the power generation and irrigation facilities from the lake; (4) to improve the ecology of Keibul Lamjao Wild Life National Park as far as practicable; (5) to take up special measures to stop any further process of siltation, eutrophication and encroachment of the lake; (6) to improve the natural fishery and fish production of the lake; and (7) to retain the natural ecosystem of the lake as far as possible. These could be possible through a dialogue between the local administrators, expert members and representative of the inhabitants in and around the lake, with advice and suggestions from external experts.

**Manipur: Native fishes in troubled waters**


Hailing from a fishing village in Manipur’s Loktak Lake, which has seen indigenous fish varieties flounder in recent decades, Tongbram Amarjit Singh’s dream project since his school days was to document and showcase the slowly fading traditional fishing practices of his community. Mapping the decline in indigenous fish species, fish catch and the concurrent waning of traditional techniques of fishing through his grandparents’ and parents’ experiences, Singh was stirred to act to preserve and conserve a culture integral to the identity of his community. Now a 35-year-old, Singh, an English translator at the state Legislative Assembly, has given shape to his dreams, with the help of his family and community, in the form of the Loktak Folklore Museum, in the island village of Thanga in Loktak Lake.

Presenting an array of fishing gear – basketry items, traps (“lu thamba”), impalers, hooks, fishing rods, cotton and fabric twine and more, this private collection is dedicated exclusively to Loktak and its environment, said Singh, who belongs to the Thanga Tongbram Leikai locality. “While
growing up we used to see our parents and their parents bring in steady amounts of fish both for consumption and for sale. Now due to growing population and environmental changes, the consumption and production is imbalanced. Indigenous species that form the mainstay of our diet are disappearing from the lake and so are the fishing tools,” Singh said. To say fish (“nga” in Manipuri) is an important source of protein for the Manipuris is an understatement. About 90 percent of people in the state are fish eaters. Anything from 1 cm to 100 cm has value. Swimming in stews to smoke-dried to fermented (“ngari”), fish is ubiquitous.

Social functions and ceremonies also involve fish. In the “nga-thaba” wedding ritual, for example, a pair of “ngamu” or Ceylon snakehead (Channa orientalis), is let go in water, symbolising the newlyweds’ journey. They relish fish and consequently fishing gears are customised to suit this dietary staple. “But in some decades, these tools may go out of fashion and documenting them is important for our cultural memory,” Singh told this visiting Mongabay-India staff writer. Loktak is northeast India’s largest freshwater body, a sub-basin of the Chindwin-Irrawaddy river of Myanmar and a Ramsar Wetlands of International Importance site.

Of at least 200 species of indigenous fish in Manipur, Loktak, at present harbours 38 of them, researchers said. Scientists at Manipur University and Zoological Survey of India (ZSI) blame changes in the hydrology due to construction of dams, blockage of migratory routes, drying up of wetlands due to siltation, eutrophication, water quality deterioration and overexploitation (open access nature of resource) for declining indigenous fish diversity in the lake.

As many 16 species of indigenous fish are believed to be extinct due to blocking of water by the Ithai barrage according to Manipur Governor Najma Heptullah. Capture of indigenous fish from the wild for trafficking for their ornamental value and absence of ban periods also add to the mix of conservation challenges. “There was nothing you could not get from the lake. What little you get now is in a poor quality and quantity. There isn’t any pengba (Osteobrama belangeri) in the water,” said Mashinga, a former member of the women’s social movement “Meira Paibi” (“women torch bearer”), who sells waterchestnuts and fermented fish for a living. Off the menu Pengba, a minor carp, is the state fish of Manipur and is reported to be “regionally extinct in the wild” due to obstruction of its migratory route from Myanmar on account of the Ithai barrage constructed three decades ago, said ZSI scientist Laishram Kosygin.

It is now mainly sourced from fish farms and is a prized delicacy both for its protein as well as for the price it fetches. In festive seasons, it can sell for as much as Rs. 800 per kg. “During our grandparents’ and our parents’ time they did fishing in more traditional ways. Now it takes a lot more effort to catch a about a kilogram of fish through traditional gears in contrast to the period before the barrage. The effort does not translate in economic gains,” said Singh in the presence of his parents and siblings who have branched out to different professions. They still fish but the condition of the Loktak Lake has rendered traditional fishery techniques economically infeasible, said Singh and members of his community. Kosygin observed that before 1950s the lake, a breeding ground of indigenous fish, contributed 60 percent of the total fish production of the
state of which migratory fish from Chindwin-Irrawaddy system formed 40 percent of the capture fisheries.

In 2004, the lake was reported to fetch the state only about 11 percent of fish. Fish diversity and yield plummeted in the last two to three decades, Kosygin said, following construction of the Ithai barrage across the Manipur River. According to Amarjit Singh, the constant high water level maintained in the lake for the functioning of the dam destroyed the breeding habitats. “They (fish) prefer shallow areas for breeding. In addition, the run-off from chemical fertilisers used in agriculture also directly affects the biodiversity of the lake,” Singh said. Before construction of the barrage, minor carps such as Labeo angara, L. bata, L. dero besides Pengba used to migrate from Chindwin-Irrawaddy river system of Myanmar to Manipur River and Loktak Lake upstream for breeding and spawning, said Kosygin. “Their fingerlings migrated downstream with the onset of monsoon. Construction of hydraulic structures, particularly, the Ithai barrage blocked the migratory pathways of these riverine fish species. These fishes have already disappeared from the lake ecosystem,” Kosygin told Mongabay India.

In addition, as pollution poisoned the lake, it became tough for the native species to survive. However, hardy Indian Major Carps (such as rohu, catla) and exotic species (grass carp), which were introduced into the lake, were able to brave and thrive. “The fishery department of Manipur introduced Indian Major Carps along with common carps in the Loktak Lake in the 1960s. Although, there is no report on the formal introduction of exotic fish like Ctenopharyngodon idella, Hypophthalmicthys molitrix, Oreochromis mossambica in the Loktak Lake, they entered the lake through peripheral fish culture farms,” Kosygin added. Veteran researcher Waikhom Vishwanath of Manipur University noted that the introduced fish varieties are also prolific breeders, expanding their population significantly while the population of native fish was not able to compete with the new arrivals.

“Such is the condition that native species are fighting a losing battle in their own habitat, and now the lake is dominated by the exotic carps,” Kosygin lamented. Hopes float in hills Manipur consumes around 52,000 metric tonnes of fish a year and produces 32,000 metric tonnes. To bridge the supply demand gap, Manipur depends on fish brought in from other states of India. “As the native fish declined in numbers, traditional traps became obsolete. To ensure adequate catch, fisherfolk resorted to unscientific methods such chemical poisoning and LED illumination,” said Amarjit Singh. LED illumination messes up the lifecycle of fish. The time required for their resting and feeding, changes, said Waikhom. “It really disturbs their day-night cycle, they mature early in more light and the eggs they bear will be less in numbers,” he said.

“So if you want to revive those old techniques then there should be proper water level and it should be replenished by the freshwater from rivers during the rainy season, then water quality will improve and population of native fish will also go up but that is not happening,” said Waikhom. In 2011 International Union for Conservation of Nature (IUCN) listed 15 fish species
from eastern Himalayas, including seven from Manipur as “endangered freshwater fish species”. However, there is hope, believe Waikhom and fellow Manipur University researcher Rameshwori Devi. “There are more than 200 indigenous varieties and we are updating the list with discovery of new species. We are also looking at hill streams. More of them (indigenous species) are adapted to hill streams so even if Loktak Lake is deteriorating due to pollution and water flow changes, in hill streams they are present,” Waikhom said.

The researchers have urged the state government for the exploration of indigenous varieties, their conservation and if possible, exploitation in a sustainable manner using laboratory breeding techniques. “There is legislation on paper (Manipur Fisheries Act 1988) but to implement them in hill areas is difficult. Some villages are much aware of the problem of loss of diversity and they have started certain restrictions in fishing in collaboration with NGOs,” Waikhom said. On the agenda is conservation of habitats. “There are few species that will survive and breed only in pebbles and sands. But sands are being mined out for construction and their feeding and breeding habitats are being destroyed. So there needs to be restriction to preserve these breeding grounds,” he said. Since most of the food fish are also ornamental in nature, Rameshori stressed on the necessity to clamp down on trafficking. “Most of the food fish in their juvenile stages have ornamental value.

The Chocolate Mahseer (Neolissochilus hexagonolepis) and our state fish, for example, are quite popular aquarium fish. The problem begins when people capture them from wild. Captive breeding can be sustainably used. DNA barcoding can help in identification and control of trafficking,” she said. However, Mashinga has different concerns. “Youth is no longer interested in traditional vocations, they have aspirations and environmental changes have driven them to pursue different fields. Who will look after our water bodies,” lamented Mashinga as she laid out batches of fermented fish for potential customers. - The Loktak Folklore Museum documents fading indigenous practices and is dedicated to Loktak lake and its environment. - With the construction of Ithai barrage and water pollution, indigenous fish species in the Loktak Lake have declined. - The lake was the breeding ground of indigenous fish species, including the Pengba – also the state fish – which is now regionally extinct in the wild, owing to blockage of its migratory route by the Ithai barrage.

**Manipur: Taste of fresh and supple fish can be relished only if Government undertakes needful action**

http://e-pao.net/GP.asp?src=15..260918.sep18

The people of Manipur would be able to relish varieties of fresh and supple fish caught from Inle Lake (in Shan State of Myanmar), Irrawaddy river and Chindwin river of Myanmar if the State Government initiates necessary steps to bring in the fishes within a short period of time to the State. After the official opening of International Border of Myanmar-India on August 8,
Directorate of Information and Public Relations (DIPR) Manipur organised a nine days media tour to Myanmar on September 9, during which the media persons visited different tourists destinations of the country. During the tour, The Sangai Express witnessed several travel destinations, visited many locations and places of interest including Taunggyi city of Shan State, Inpawkhon village, Inle Lake (which is 22 km long and 10 km wide).

The Myanmar check post located 4 kms away from the beautiful Inle Lake verifies the tourists and gives entry tickets at the rate of Rs 650 (1350 Kyatt). Apart from promoting the Lake to the tourists, the ticket system is a means of livelihood for most of the locals in the area. Later, the media persons reach Hotel Paradise near the freshwater Inle Lake. People can experience the beautifully set up hotels, shops near the Lake as the locals set up different hotels which present beautiful views of the Lake to attract the tourists. The people of Shan State can also be seen promoting local made products and vintage items to the tourists as a means of generating income. The team of media persons enjoyed a boat ride (nine people for a boat) witnessing beauty of Inle Lake. The Sangai, Express also observed the people of Myanmar setting fish traps, gathering plants/vegetables which grow under the Lake and plantation of various plants on the islet (Phum) which are important sources for income generation.

Many pagodas were also seen along the Inle Lake as well. Myanmar provides large opportunities for the people to earn their livelihood by selling souvenirs and through the attraction of tourists by the beautifully built monasteries, hotels, markets etc. After the boat ride, the team reached a restaurant built on the Lake and relished a variety of foods offered by the restaurant and continued their journey by visiting Khit Sunn Yin Lotus, Silk and Cotton Hand Weaving Centre at Inpawkhon village. The Sangai Express also came across the womenfolk weaving threads from lotus stems and making them into clothes and garments. While speaking to The Sangai Express, a local person conveyed that at least 20 varieties of fish are found in the Lake including Shareng, Tunghanbi, Ngaprum (eel). Claiming that the number of eels are slowly decreasing in the Lake, the person stated that necessary steps are being undertaken to save and protect the fish.

The person proudly claimed that Myanmar Scientists have declared that maximum varieties of fish are available in Inle Lake. The Sangai Express found that the freshly fried and cooked fish caught from the Lake had a unique and different taste which differs from the ice-packed fish, brought into Manipur after long period of shipping. On the other hand, Act East Policy convenor RK Shivachandra conveyed that fishermen of the country are generating their income by selling Pengba fish, which they catch in large numbers from Irrawaddy and Chindwin river (which runs in Mynamar). He claimed that building of Ithai river probably blocked the said fish from swimming up the rivers into Manipur which decreased its availability in Manipur as well. The people of Manipur would be able to taste these fresh and supple fish within two nights time from the neighbouring country of Myanmar if the State Government takes up appropriate steps.
These fishes, which are only two nights away, will contain more health benefits as compared to the ice packed fish imported to Manipur, which usually takes a long time to reach the State. It is believed that around 52 metric tonnes of fish are consumed in a year while the Fishery Department has often claimed that only 32 metric tonnes of fish are produced every year in Manipur. The majority of the people are consuming spoilt ice packed Shareng. However, the freshly caught Shareng from Irrawaddy and Chindwin river will definitely taste better and have better health benefits as well. During the tour, DIPR Director H Balkrishna stated that Inle Lake is quite similar to Loktak Lake and both the freshwater Lake are famous worldwide. He claimed that the Myanmar Government, through Public Private Partnership (PPP), is undertaking steps to protect and promote the Lake and around 1000 hotels are being set up on the Lake.

One difference between Loktak Lake and Inle Lake is that there are less infrastructure and minimum number of tourists visiting the Loktak Lake. He conveyed that a total of Rs 20,000 was paid as entry fee for 28 member team, while entering Inle Lake and added that only the fee alone would help in boosting the country's income. Balkrishna claimed that such kind of revenue does not come from Loktak Lake. Stating that varieties of vegetables including tomatoes, brinjal, pulses and dais are planted on the islet (Phum) of Inle Lake, the Director conveyed that Shan State is successfully trading their produces with China, Laos and Thailand (which are its neighbouring countries). It would not be an exaggeration to say that the State's revenue will improve if such kind of initiatives are taken up in Manipur as well. If plantation, farming is carried out extensively at Loktak Lake similar to Inle Lake, the problem of unemployment will be solved to an extent and the State will be able to generate some income, he added.

**Manipur: Save northeast wetlands for human well being**


Maintaining healthy ecosystems is cost effective whereas restoration of contaminated ecosystems is cost prohibitive. To what extent do concerned authorities in India have high values and regards for the environment, especially wetlands considering its value in human life? Are they doing it right? The wetlands are the most productive ecosystem in the world that provides food, agricultural production, fisheries, water quality maintenance and recreation and also one of the key life support systems on Earth, acting to purify water, control floods, replenish groundwater and recycle nutrients. All these benefits or services that wetland ecosystems provide are essential for people's livelihoods – particularly in developing countries like India. Despite these benefits, wetlands are consistently being destroyed, devastated, contaminated and converted to other land uses at a rate more rapid than any other ecosystem.
In this context, it is pertinent to mention that ecosystem services provided by the wetlands are not being fully captured in commercial markets and as a result not adequately valued during development decisions in India. India has about 757.06 thousand wetlands with a total wetland area of 15.3 m ha, accounting for nearly 4.7% of the total geographical area of the country. Out of this, area under inland wetlands accounts for 69%, coastal wetlands 27%, and other wetlands (smaller than 2.25 ha) 4%. Among them, 26 sites have been designated as Wetlands of International Importance (Ramsar Sites), with a surface area of 689,131 hectares covering the many states in India. The Northeast covering seven states has a vast network (7731 medium to large and 11736 small) of wetlands constituted by ponds, marshes, rivers, lake, water-logged area, ox-bow lakes and reservoirs covering an area of 1.66 million hectares that is around 4.17% of total geographical area of NE.

All these wetlands are distributed among the seven states ( Assam- 3513 including Deepar beel, Island Majuli and others; Arunachal Pradesh -43; Nagaland-267 including Doyang lake, chte reservoir; Manipur-167 including Loktak lake, Mizoram -88, Tripura-432 including Kuda sagar, Gomti reservoir, Sipahijala reservoir and others, Meghalaya- 135 including Barapani lake, Sikkim-160 wetlands greater than 2.25 ha including Gurudokmar Tso and Lashar Marsh Land ). The NE forms a complex geomorphology with vast flood plains, valleys, hills and ridges of varying elevations and shares a common migration route for many of the avifauna that flies over Bhutan, Tibet, China, Myanmar and Bangladesh. The rural landscape of the state is endowed with wetlands of various types identifiable on the basis of their micro-geomorphic characteristics and associated human response and perception.

The pattern of their utility also varies according to the social background, tradition and economic condition of the people around the rural lives in NE are intrinsically linked mainly with the subsistence mode of farming, livestock rearing and traditional fishing closely connected with the wetlands. However, with the modernization of society, particularly during the last few decades, the traditional use of wetlands has experienced remarkable changes. The overexploitation of wetland resources, irrational mode of fishing, invasion by weeds, siltation, proliferation of invasive species, change of land use patterns and developmental activities and pollution caused have posed serious threats to the wetland ecosystems leading to partial or complete loss of the wetland habitats.

Many birds and other species are reported to be absented themselves from these areas due to loss, fragmentation and degradation of their habitat. Our study clearly reveled that increment of pollutant load in wetlands far exceed their capacity to retain pollutants and remove them through nitrification, sedimentation, adsorption, and uptake by aquatic plants. This adversely affects the wetland water quality; contamination of vegetables and crops; the cradles of biodiversity and key constituents of our environment. In addition, the continued poverty among the villagers, their ignorance and indifferent attitude towards the wetlands and unsustainable ownership pattern have also adversely affected the wetland ecosystems. Moreover, lack of proper attention to the
rural situations; defective development policy instruments particularly those based on macro-regional considerations; social inequalities and poor planning amplifying the environmental pressures of economic expansion and profit-maximization approaches by the exponential growth of real-estate markets have significantly impaired the wetlands.

The concerned authorities do not realize the importance of holistically analysing the complex eco-social systems of these wetland as per the guidelines of Ramsar convention and role of the local community who gained it as Ramsar site to explore the different strands of urban ecology ecosystem. The continued spree of loss and degradation of these wetlands in different parts of the NE has over a period of time brought the ever-deepeening ecological crisis to the fore. The status of three wetlands in the northeast – Deepor Beel in Assam, Loktak Lake in Manipur and Rudrasagar Lake in Tripura- recognized as Ramsar sites is the clear evident of poor environment governance as discussed below. Deepor Beel The Deepor Beel wetland area of 4000 ha housing 219 species of birds including more than 70 migratory species; and wild asian elephants, leopard, jungle cat and the protected barking deer, Chinese porcupine and sambar and providing natural resources for the livelihood of 14 indigenous villages has reduced to 405 ha due to continuous encroachment and waste dumping.

In January 2006, nine storks were found dead due to severe environmental pollution originating from domestic and industrial sources. Construction of a broad gauge railway line has badly blocked the centuries-old elephant corridor. Loktak Lake Loktak Lake in Manipur is well known for the phumdis (heterogeneous mass of vegetation) floating over it and the Keibul Lamjao National Park located on this phumdi is the only floating national park in the world, and home to the endangered Sangai and Manipur brown-antlered deer. The lake's rich biological diversity comprises 233 species of aquatic macrophytes of emergent, sub-emergent, free-floating and rooted floating leaf types and 57 species of water bird. Development activities such as hydropower generation, irrigation and drinking water supply for economic expansion are the major stress factors and cause rapid conversion to other uses and their function in a wider economic sense.

Rudrasagar Lake Rudrasagar Lake, a unique natural sedimentation reservoir, receives water from three perennial streams and removes the sediment from the water and discharges into the river Gumati through a connective channel — Kachigang. Among the rarer species recorded are the endangered Baer's Pochard and near-threatened Ferruginous Duck. Uncontrolled Growth of invasive aquatic weeds like water hyacinth has created anoxic conditions in the lake, thus raising toxicity and disease levels leading to loss of aquatic biodiversity mainly due to dumping of garbage, deposition of solid waste and storage of construction materials along the shoreline. In addition to these, large-scale use of pesticides and fertilizers in the area adjacent to the lake is posing threat to the unique lake ecosystem.
In view of the existing status of these three important wetland, it is pertinent to mention that wetland authority responsible for boundary demarcation, wetland character detection, pollution measures, awareness programs, and biodiversity conservation in accordance with Ramsar convention has miserably failed to protect continuously shrinking of the wetland. Based on Wetland (Conservation and Management) Rules, 2010 issued by the Government of India (under the Environment protection Act, 1986), the concerned authorities have identified several major threats to the wetland but they have failed to strengthen urban wetland governance to prevent ecological transformation and loss of wetland. In developing countries, wetlands are still considered as wasteland due to the unconsciousness of the people about wetland potentials and deficiency of the techniques of wetland uses.

Technically in addition to Wetland Authority for conservation and management, the wetland comes under several legal institutions including the Municipal Corporation, Public health authority, Forest department, the Housing and Infrastructure Development Corporation that is concerned with urban development, the State Pollution Control Board (SPCB) that is concerned with cleanliness of environment, and Department of Fisheries of respective states. Strategically Wetland Authority framed cross-sectoral policy integration, conservation, community participation etc but another authority- Municipal Corporation in all the states with the political support of the Ministry of Urban Development and financial support of state, central and corporate can supersede the decision taken by Wetlands Authority. Thereby Wetland Authority is not in position in policy advocacy in other sectors.

In meetings, top level officers strongly advocate the necessity of these developmental activities for public interest and also assure to create eco-park, water park, tourist hut, attractive commercial shopping mall for the tourist etc without addressing optimization of ecosystem service delivery, development of sustainable urban and wetland management, "wise use" of wetland, community participation to guarantee social equity in environmental governance. Then what "public interest" and for whom! Practically this "public interest" is meant for the corporate who are interested only to develop infrastructure by reducing the wetland thereby depriving the local community in expectation of their livelihood and threatening the ecosystem services delivery.

If shrinkage and contamination is going on due to poor environment governance, ecosystem services will be severely hampered due to declining crop and fish yield and high land price. Declining the profitability will open the door to capture the wetlands for real-estate market and urban development in name of public interest. Recently the Ramsar Convention has undergone significant conceptual transformations to adopt the principles of 'wise use' for wetland conservation; wetland restoration and creation; understanding the value of wetlands; community participation and integrated planning. The "wise use" based on these practical guidelines have a crucial and positive impact on wetland management theory and practice. In this view it is pertinent to mention that in NE, wetland degradation and loss of wetlands through rapid
conversion is one of the emerging challenges against sustaining such worthy environmental capital having plenty of goods and services.

Many researchers all over the world strongly advocate the uniqueness and opportunities of the wetland ecosystem by calculating its economic value adding to the economy of the local community and demonstrating its potential of biodiversity particularly avifauna and other animals and ecosystem services. The wastewater if discharged in a controlled way can be used as nutrient source for pisciculture and agriculture by the local communities. These wetlands can play, if protected by the concerned authorities, a strategic role in the process of economic development of a country particularly in NE. It has already made a significant contribution to the economic prosperity of advanced countries and its role in the economic development of less developed countries is of vital importance.

The central government, in place of giving thought to the economic expansion without addressing the environment and society, must encourage the state governments to tackle it where these valuable ecosystems are in the verge of disappearing. Then these wetlands will be a unique example of sustainable socio-economic development pertaining to resource recovery wetlands in the present scenario of economic recession and pollution problems. Now the protection of cultural values and community use of wetlands as well as conservation and restoration of wetlands are the emergent needs. According to Ramsar Convention, the policy integration and integrated planning by institutional arrangement must be encouraged. In addition to these arrangements, local community and NGO who are trying their best to protect the degradation of ecological features in an urbanized landscape, must be included with formal institutions for technical support that would be a key strategy in urban wetlands governance.

**Manipur, Madhya Pradesh, Jharkhand, Bihar and Odisha: Training on fish feed underway at CIFA**


A NFDB-sponsored five-day national training on “Recent Trend on Feed and Feeding Strategy for Various Life Stages of Commercially Important Freshwater Fish” from August 21 to 25 at the ICAR-CIFA here is underway. Inaugurating the programme, ICAR-CIFA Director Dr BR Pillai emphasised the production of cost-effective diet for different life stages of fish by using locally available feed ingredients. She also expressed that in order to increase the present fish production of 3.0 tons/ha to 6.0 tons/ha, supplementary feed is essentially required. She had advocated for the sustainable and eco-friendly aquaculture.
Course Director Dr KN Mohanta opined that for doubling the income of fish farmer, the input
optimisation is the need of hour. He also spoke about the different feeding strategies to be
followed to reduce production cost and increase the profit margin. Programme Coordinator Dr
KC Das gave the outline of the training program and ICAR-CIFA Principal Scientist Dr SC Rath
offered a vote of thanks. Fisheries Department officials from the Government of Manipur,
Madhya Pradesh, Jharkhand, Bihar and Odisha and Officers from the other Central
Governments, entrepreneurs, progressive fish farmers and the trainers from the Aqua Field
School (AFS) participated.

Manipur: Saving the world’s only floating national park and its dancing deer


Manipur’s iconic Loktak Lake and its floating islands (phumdis), the last natural refuge of the
critically endangered Sangai deer or the Indian Eld’s deer (Rucervus eldii eldii), are losing
ground to mushrooming agricultural practices and human settlements, reports a study. These
changes in land use patterns may be linked to the construction of the Ithai barrage in 1979 at
Ithai (downstream of Manipur river) for the Loktak Hydroelectric Project, the study notes. The
246.72 square km lake, slightly smaller than the Caribbean islands of St. Kitts and Nevis, is a
Ramsar Wetland of International Importance cradled in the floodplain of the Manipur river.
About an hour and a half from Manipur’s capital Imphal, the lake and the resident Sangais are
the principal attractions for travellers.

It is also northeast India’s largest freshwater lake and like a jewel in a crown, it is positioned
almost centrally in the state of Manipur that shares borders with Myanmar (earlier known as
Burma). Teeming with a diverse range of flora and fauna, the lake ecosystem lies in the Indo-
Burma Biodiversity Hotspot. A source of water for hydropower generation, irrigation and
drinking water supply, the lake has become a hotbed of tourism and related developmental
activities. And since time immemorial, the ancient water body has nurtured fishing and
agriculture shaping, the region’s socio-economy. According to the folklore of the Meitei,
Manipur’s culturally dominant indigenous group, the lake was home to India’s very own Loch
Ness monster, a mythical horned python called Poubi Lai. Now, the wetland system is in the
crosshairs of development and tradition with environmental conflicts underpinned by changes
largely ascribed to the 40-year old barrage.

Using satellite data from 1977 to 2015 (from the pre-barrage to post-barrage period), scientists
have mapped the decline of the phumdis that are critical in supporting the weight of these
animals (also called dancing deer for their dainty gait) as they negotiate their way through the
floating islands. “We have observed a loss in phumdi area that is equivalent to more than double
the increase in agricultural areas in a span of 38 years from 1977 to 2015 (from the pre-barrage
to post-barrage period),” Rajiv Kangabam, from Assam Agricultural University and lead author of the study, told Mongabay-India. Deer that dance across the phumdis Protecting the wetlands ecosystem with the phumdis is crucial to conserve the Sangais, because the beautiful animals are concentrated in the 40 square km Keibul Lamjao National Park (KLN), that is actually a floating meadow or island (phumdi) in the southern rim of the lake.

It is considered as the only floating reserve in the world. Only 260 dancing deer remain, as per the forest department while wildlife biologists from Wildlife Institute of India stack the figure at less than 100 adult breeding individuals. The endemic Sangai was believed to have gone extinct until a remnant population was discovered in the early 1950s. Ubiquitous in folk art and lore, the Sangai is also the state animal of Manipur. The emblematic species also lends its name to the annual festivities (the Sangai festival) organised by the state government each year in November. The KLN was created in 1977 to conserve the last of the Sangais and the lake biodiversity within the phumdi ecosystem. Tourists who opt for boat rides in the waterways within the phumdis can step on them and feel them pulsate. This is because phumdis are floating mats of soil, plants and organic matter at various stages of decomposition all naturally bundled together.

Part submerged, part floating they are the elements that impart uniqueness to the Loktak ecosystem. Two-thirds of the saucer-shaped lake is dotted by these floating meadows. The study highlights the loss of floating islands from the southern and northern part of Loktak as a “major concern” that will lead to the “destruction of the only floating national park in the world.” It indicates an increase in open water area, human population and agricultural area. In the study, in terms of land use changes, the highest loss is reported in phumdis with thin vegetation (49.38 square km) followed by phumdis with thick vegetation (around nine square km), while there was an overall increase in open water bodies (27 square km), agricultural areas (25.33 square km) and settlement (5.75 square km).

Kangabam said the rapid growth in human settlements is associated with the submergence of vast swathes of agricultural lands, a fallout of the construction of the Ithai barrage. “It was estimated that 20,000 ha (83,000 ha unofficial) of arable land was submerged resulting in the loss of employment of the local people. This led to increase in human pressure on the lake resources leading to increase in human settlement and a high demand for fish,” he said. The authors also identified the need for the proper implementation of the Manipur Loktak Lake (Protection) Act, 2006 in order to guide the increasing anthropogenic activities in the lake area, to protect the Loktak through sustainable management and conservation of the rich biodiversity.

The analysis also underscored the need for regular monitoring and implementing proper land use practices in and around the lake in order to restore the degraded ecosystem plagued by pollution and an altered aquatic regime. “There is a need to balance ecological protection and human needs. Without provision of alternative livelihood options, the human pressure on the lake will go up and this will be disastrous for the lake,” Kangabam said. Oinam Rajen of All Loktak Lake
Areas Fishermen’s Union Manipur (ALLAFUM) agreed with the inference. “At least two lakh people are directly dependent on the lake for fishing. The demand for fish has increased. However, adequate fish is not available in the lake. This is mainly because the migratory fish from Chindwin-Irrawaddy river system to Manipur river system have declined steadily after the barrage came up.

Human settlements have gone up and so has paddy cultivation,” said Oinam Rajen. However, Rajen demanded scrapping of the 2006 Act. “This is compounded by the fact that we are prevented from carrying traditional fishing equipment inside the lake as per provisions of the Act. Rights of fisherfolk are being curtailed in the name of conservation. We are importing fish from other states to make up for the deficiency,” rued Rajen. Fading phumdis Around nine percent of the total population of Manipur (0.2 million/2.2 lakh) dwell in 12 towns and 52 settlements placed in and around the lake, earlier dubbed a “lifeline” of the people of Manipur. By absorbing the annual monsoon flood, the lake plays an important role in flood control and conserves water through the dry months.

The cultivation of paddy is the traditional practice in the phumdis, explained Kangabam, adding that it also the source of livelihood for the rural fisherman who inhabit the surrounding villages and also on the phumdis in traditional huts called “khangpoks.” Some paddy varieties can also grow in the submerged conditions of the phumdis. Resembling green rings, man-made aquaculture ponds called “athaphums”, created by segregating portions of phumdis, are used for fishing. Fresh and fermented fish hold sway in the Manipuri diet. The operationalisation of the Ithai barrage in 1983 for hydroelectric power generation and irrigation purposes, without proper planning, has been linked to a multitude of problems shrouding the once pristine lake. In 1986, the Manipur government constituted Loktak Development Authority (LDA) to check the deteriorating condition of the lake and to bring about improvement of the lake ecosystem along with development in the field of fisheries, agriculture and tourism while conserving the catchment area.

Decline in fish resources affecting the livelihoods of the fisher communities, enhanced soil erosion leading to wetland sedimentation due to shifting cultivation and loss of vegetal cover in the catchment area, reduction in water holding capacity of wetlands as a consequence of siltation, encroachments and prolific growth of aquatic vegetation are some of the problems listed by the LDA on its website. Gradual degradation of the lake and associated swamplands sparked international concern with the water body being included in the Montreux Record in 1993 as a result of problems such as “deforestation in the catchment area, infestation of water hyacinth, and pollution.” Serving as the receptacle for about 30 rivers and streams, the lake has turned into a dumping ground for the untreated waste that is drained into it from these water bodies, including the highly polluted Nambul and Nambol rivers. The barrage is the only outlet for the rivers.
“In addition, the establishment of the Ithai barrage has disrupted the normal flushing pattern of the lake and also interfered with the natural process of synthesis and breakdown of the phumdis,” Kangabam said, referring to the unique sink and swim cycle of the floating islands critical to its growth and function. Earlier, during the monsoons when the water level would go up, the phumdis would float on the lake surface and in the dry season they would sink to the lake bed and sponge off the nutrients there which were essential for the growth of vegetation. When the rain came, the islands with nutrient-laced plant roots would float again. However, the Ithai barrage (10.7 metres high and 58.8 metres long) for the Loktak hydroelectric project has resulted in “permanent flooding” of the lake. “Now, there is continuous storage of water in the park area as a result of the barrage and islands float throughout the year even during the winter season.

This has prevented nutrient uptake by the islands, thereby reducing their thickness,” said Kangabam. Kangabam and co-authors of the study have flagged this reduction in thickness as a “major concern” for the Sangai. Oinam also pointed out that water pollution and resulting enrichment of nutrients, fuelled the growth of the aquatic weeds and led to the proliferation of the phumdis at a certain point in time after the barrage came up. “Before the construction of the Ithai barrage, the phumdis would proliferate and during the rainy season, they would be discharged from the lake to the Manipur river thereby maintaining the population. But the construction of Ithai barrage blocked the passage and changed the flushing mechanism,” Kangabam said. Oinam claims it was due to the efforts of the fishing communities that the phumdis were prevented from pervading the entire lake. “We took it upon ourselves to clear off the excess phumdis.

Since time immemorial, the fishing communities have maintained the lake,” Rajen said. The subsequent decrease of phumdis from the central part of the lake is due to the removal of the biomass (by authorities) to maintain the water quality, said Kangabam. “The proliferation of phumdis has decreased from the central part. In the northern and southern part the phumdis remain as it is. But human activities have increased in those parts so overall phumdi area has gone down,” Kangabam said. Bioprospecting for bacteria in the phumdis Saving the lake is also advantageous for bioprospecting of potential bacteria for their use in agriculture as plant growth promoters (biofertilisers). Recently, a team of scientists isolated 26 bacterial strains from the phumdi sediment and lake water, which they say, can be used in sustainable agriculture.

These isolates from Loktak Lake have the potential to be used for the production of industrially important enzymes and in agriculture as plant growth promoters (such as siderophores, indole acetic acid or IAA), said Milind Mohan Naik of Goa University’s department of microbiology in a study. For example, among the 26 Loktak bacterial isolates, Enterobacter tabaci strain KSA9 is found to produce siderophore, IAA, involved in nitrogen fixation, phosphate solubilisation and ammonia production. The presence of plant growth promoting microorganisms was expected from phumdi sediment, due to the fact that the local people use phumdi sediment as a biofertiliser in agriculture. It exhibits good plant growth promotion that may be attributed to the
presence of bacteria. The bacterial diversity is facing threats due to the overall disturbance of ecosystem.

Trading barbs Beset with dwindling water quality and ecosystem, the lake has been battleground between the LDA and a section of fishermen with both parties trading charges on who is responsible for destroying the wetlands. The fishermen’s union claims that in the name of cleaning the lake, the LDA is damaging lake while the authority alleges the fishermen and their floating huts are the ones harming the lake. “Enforcing the Manipur Loktak Lake (Protection) Act, the government (under the then Chief Minister Okram Ibobi Singh) began to clear the lake of human settlements in 2011. There were 1100 huts built on the phumdis. 777 huts were burnt and hundreds of families and more were evicted since then. The fisherfolk were dubbed ‘occupiers’,” Rajen said.

According to activist and researcher Ram Wangkheirakpam of Indigenous Perspectives, the Loktak Protection Act requires a “proper review” for the fact that it does not conform to the requirement of the Ramsar Convention nor to the more recent National Wetland Convention Rules 2017. “The Act does not cover the whole of the lake. It excludes the water sports area at Takmu that they have carved out as also the Keibul Lamjao National Park. There are two resorts, and two hotels coming up, they are also trying to evict some 450 families for the resort in the name of tourism promotion in the state,” the activist said, adding that Loktak Development Authority is a failed institution and requires a comprehensive revamping of its constitution and composition. “It is clear that this Act has been twisted to fit in certain kind of activities while putting traditional users as victims.

Traditional livelihood options have somehow been sidelined while non-traditional activities are being promoted. The local community must be included in conserving this wetland,” Wangkheirakpam said. - Manipur’s iconic Loktak Lake and its floating islands (phumdis), the last natural refuge of the critically endangered Sangai deer are losing ground to mushrooming agricultural practices and human settlements, reports a study. - Changes in land use patterns may be linked to the construction of the Ithai barrage in 1979 at Ithai (downstream of Manipur river) for the Loktak Hydroelectric Project. - There is a need for regular monitoring and implementing proper land use practices in and around the lake in order to restore the degraded ecosystem plagued by pollution and an altered aquatic regime.

**Manipur: Food safety awareness drive conducted**


Food Safety and Standards Enforcement officials of Bishnupur district conducted an awareness drive aimed at fermented fish producers, fish and poultry sellers, at Ningthoukhong bazaar, Bishnupur bazaar, Nambol bazaar and Moirang bazaar. A press release issued by the Designated Officer of FSA Bishnupur stated that the team, led by Heisnam Premkumar Singh (FSO) and Dr
Moirangthem Dinesh Singh (FSO) under the supervision of Y Surendro Singh (DO), gave instructions to the fermented fish producers on how to prepare he fermented fish in a proper and hygienic way.

The food safety officials also instructed food business operators selling fish and poultry to maintain hygienic condition like cleaning of wooden blocks, covering of meat, cleaning of walls, floors etc. The team also instructed those concerned to store any leftover meat or fish in deep freezers and they were also advised to obtain FSSAI licence or registration from the authority concerned. It explained that fish and poultry are protein rich food which are consumed daily by the people of Manipur and the awareness drive was carried out today as many food business operators manufacturing or selling fish and poultry lack awareness about good manufacturing practice and good hygienic practices.

**Manipur: People, govt opt for organic fish**


The Manipur valley is associated with lakes, rivers, wetland including one of the biggest fresh water lake the Loktak. People of the state had been depending on the water bodies to get fish. With the rise in population the demand for fish has grown up drastically. Fish remains the favourite dish. Manipur Fisheries Minister N. Kayisii said the government is trying to increase fish production. He said the state produces 32,000 metric tonnes of fish against the annual estimated requirement of 52,000 metric tonnes. Kayisii said his ministry is working for "Better Management Practices for Fish Culture" and a booklet was also prepared for dissemination to the farmers, Fish is imported mostly from southern states and as the journey is long and arduous it was suspected that formalin was used to preserve the fish.

The fear led to the ban of import of fish by the state Food Safety department in June last. It was also suspected that the imported fish was not properly maintained and hormone used to increase weight. As formalin and hormone used in the process were harmful to the human bodies the ban was imposed. The ban has led to serious debate between fish traders and the state government officials and test was done on the imported fish. Formalin was found in many cases and after the government clamp down, use of formalin was stopped and import partially allowed. The people of the state however were reluctant to use the imported fish and health conscious people stopped using the imported fish. It led to drastic increase in rise in prices of local fishes and on special occasion shortage of fish was experienced.

People continued to buy imported fish for two reasons, low price and easy availability. Preserved and processed fish are also imported in huge quantity from Myanmar through the border town of Moreh but Myanmar is not able to provide fresh fish to Manipur. Fish traders said as people were conscious about health and test kits were available to detect formalin, use of formalin has been stopped and ice was used to preserve the fish. Loktak lake remains the biggest source of fish in
the state but the construction of Ithai barrage has led to non-availability of large numbers of fishes in the lake. The barrage stopped the upward flow to the lake from the rivers and fishes which flowed towards the lake from the downstream area have stopped coming the lake. Fishers at Loktak lake said the fish from downstream areas were in high demand and the sudden stopping of upward water flow led to serious changes in the availability of fish and environment of the lake.

Experts and the Manipur government have demanded demolition of the barrage as serious environmental hazards were caused. It also led to decrease in size of the lake. Water bodies were gradually decreasing as people have filled up water bodies to construct houses. Only few water bodies remain and of the biggest water body area like Lamphelpat has no trace of water now. Government offices, quarters have been constructed resulting in serious floods in the city areas. The other sources of fish that is the river were mostly polluted hence it was not possible to seriously take fish farming in the rivers, officials said. The only solution was digging ponds in the low lying areas and taking up fish farming.

Fish farming can't be done in hill areas in large scale hence it was concentrated in the valley areas. The farmers said frequent flood caused serious problems. In the flood that occurred last month the fishes were washed away hence the farmers lost all their investments, they said. It is problematic as it has to be done in low lying areas prone to flood. Flood management should be given special attention to help the farmers. With people demanding good quality tasty fishes, land availability decreasing day by day supply of the favourite food of the state remains the greatest challenge today.

**Manipur: Prepares for mass production of fish as import banned**


Manipur Chief Minister N. Biren Singh on Friday said the present government is keen to enhance the fish production in the state so that the state would have a self-sufficient fish production by 2020. Manipur government has banned import of fish as formalin and other harmful chemicals were used to preserve the fish. Addressing the gathering at the first ever ‘Fish Farmers’ Meet’ held at Durbar Hall, Chief Minister’s Secretariat today, Mr Biren said there is vast scope for fish farming as there are abundant water bodies in the State. He maintained that a Fish Feed Factory would be set up at an estimated cost of Rs. 1.5 crores in the state soon. Fish feeds would be easily available in the market, he added. Mr Biren stated that a bigger factory would also be constructed under the PPP model.

Chief Minister further said a state level Committee has been formed to increase the fish production in the State soon. He highlighted that such kind of meeting is especially convened to chalk out the plans with the officials of Banks, NABARD, Fisheries Department and Fish
Farmers to improve the fish production in the State. Around 200 fish farmers attended the meeting. During the three hour long meeting, farmers gave their opinions and suggestions to increase the fish production in the state. Many farmers appreciated the government for organising such meeting. During the meeting, the farmers were made aware of the existing Central and state sponsored schemes for fish farming in the State. It may be mentioned out of the 50,000 Metric Tones fish required for consumption in the state, only 30,000 Metric Tones are being produced by the fish farmers in the state annually.

**Manipur: Formalin treated fishes: Fishery Dept on high alert**

http://e-pao.net/GP.asp?src=16..300618.jun18

Following the recent seizure of imported fishes laced with formalin, a preservative with harmful side effects, at Nagaland and various other States, the Secretary (Fisheries) of the State has instructed the State Fishery Department to investigate the possible presence of formalin in the fishes imported into the State as well as to submit a detailed report regarding the issue at the earliest. On the other hand, the State Government has directed the Nodal Officer (Food Safety) Manipur to ban the sale of ice packed fishes containing traces of formalin in the State. Speaking to The Sangai Express, Secretary (Fisheries) Maranchan Luikham said that it is estimated that Manipur consumes around 52000 metric tonne of fish products in a year. Out of this, the State produces around 32000 metric tonne while the remaining 20,000 metric tonne are imported from outside. Most of the fish products imported from outside the State have the potential to be laced with preservatives.

But till date, there has been no report about the presence of formalin treated fish products in the State, he said. Pointing out that news have been heard about the presence of formalin in fish products in Nagaland and Kerala, Luikham said that in the interest of the people, the State Government has directed the Director of Fisheries to investigate and see if the fishes in the market are treated with formalin and to submit a detailed report regarding the same at the earliest. It may be mentioned that there was a recent case of seizure of fish products laced with formalin in Nagaland, Kerala and some other places. Such fishes were disposed by the authorities. Formalin is a poisonous/toxic chemical. It is mainly used in hospital mortuary to preserve dead bodies and to prevent them from decomposing. The chemical is colourless and as such it cannot be identified at a glance and needs to be tested in a lab for its presence. In huge doses, formalin has the ability to cause cancer in humans. On the other hand, Luikham said that the State Government, under the supervision of the Chief Minister, is working tirelessly to make the State self reliant when it comes to fish products by 2020.

The Government is working towards increasing the quantity of fish products under schemes like Rashtriya Krishi Vikas Yojana (RKVY) and Neel Kranti, Luikham said. Under RKVY, which is taken up under the Ministry of Agriculture, steps like digging of ponds, rearing of fishes at wet
lands, funding fish farmers and fish farmer societies and imparting necessary training to the fish farmers for increasing fish produce are carried out. Under Neel Kranti, fish farmers and societies are also funded to increase the fish produce. Technical support, cage culture, rearing of fishes in water bodies, development of hatcheries, insurance for fishermen and fish farmers are also provided and the State Government is working tirelessly to improve the fish production of the State under the said schemes, he added.

Pointing out that the State Government is trying to implement fish rearing at hill areas by building dams under funding of the North Eastern Council, the Secretary added that steps are also being taken up to ensure the presence of good quality fish fingerlings. He claimed that most of the fish fingerlings from private hatcheries are not of good quality and often fail to grow to the desired size. Luikham informed that the State Government and a firm based in Chennai are working to establish a hatchery at Leimakhong Mapal under Public Private Partnership (PPP) model. The State Cabinet has also approved the signing of an MoU and the launch of the project, the Secretary added. The State Government will dig and manage the ponds for the project while the firm will produce the machinery required. This will facilitate the production of around 5 to 7 million fish fingerlings per year, he added.

The State currently has 7 hatchery units and this project will help boost the productions of fishes in the State. Speaking about fish feed, the Secretary informed that the State Government is planning to establish a fish feed production unit at Lamphel at the cost of around Rs 1.5 crore. The necessary funds have been sanctioned and process of finalising the building blueprint and the machinery required is underway. The unit will be able to produce 5 to 7 tonne of fish feed per day. Pointing out that the ever increasing population and industrialisation has led to vanishing of water bodies, Luikham said that even in the face of such odds, the State Government will try to create more fish ponds and water bodies. A special committee called Manipur State Fish Development Technical Committee was formed and it recently submitted its recommendation regarding the steps to increase the fish produce of the State. As per its recommendation, the State Government is trying to organise a meeting of all the Departments concerned at the earliest, he added.

**Manipur: Loktak lake facing serious ecological threats**


Home to rare flora and fauna and locally revered as a “mother” — provider of life to all — Loktak Lake in Manipur is facing serious ecological threats due to intensive human activities, siltation and pollution, environmentalists have cautioned. In a study published in the latest journal of the Current Science, they said North-East’s largest lake, spread over 287 square km area needs urgent conservation, being one of the most productive ecosystems that support
livelihood of locals as well as diverse and unique habitats, including that for Sangai, endemic and endangered deer found only in Manipur.

The most unique feature of the Loktak Lake is the presence of a series of floating islands locally known as phumdis — the massive heterogenous masses of soil, vegetation and organic matter in different stages of decay and present in various sizes. Locals use these structures for agriculture purpose and even build houses on them. On one of the largest phumdis lies world’s largest floating park, Keibul Lamjao National Park. However, the researchers have noted that the construction of the Ithai barrage without proper planning has led to uncontrolled proliferation of Phumdis, thus reducing the open lake area. “This has blocked the migratory pathways of a number of fish species and degradation of catchment areas. Thus, owing to versatility of this natural habitat of diverse groups of micro and macroflora, there is an urgent need for conservation of this fragile ecosystem.

“The life of thousands of people living in this area is dependent of the lake itself. The destruction of this lake will ultimately result in the loss of natural habitat for birds, fishes, wild animals, livelihood and also industrially and agriculturally important microbes,” said the team of researchers including Komal Salkar, Milind Mohan Naik and Vishwanath Gadgil from Goa University, Santosh Kumar Dubey from BHU and Radha Raman Pandey from Manipur University. The lake is home to a rich ecosystem harbouring 81 species of birds, 25 species of reptiles, six species of amphibians and 22 species of mammals, migratory fish from Chindwin-Irrawaddy basin of Myanmar, migratory waterfowl and an endangered species of Eld’s deer, the Sangai.

People of Manipur are dependent on Loktak Lake and phumdis for different economic activities like fishing, agriculture, fish farming, trading of lake products, traditional handicraft made of lake products such as mats, baskets and other woven goods, etc. The ethnic group of Manipur, Meitei see the lake as a mother-provider of life to all. The lake has been included under the Ramsar Convention, an international treaty for the conservation and sustainable use of wetlands. The study has been supported by SERB-DST Fast track Young Scientist Project, Science and Engineering Research Board - Department of Science and Technology.

**Manipur: Union finger at LDA for Loktak pollution**


The All Loktak Lake Areas Fishermen's Union, Manipur (Allafum), strongly condemned the statement made by the Loktak Development Authority (LDA) on May 4 regarding the conservation of cultural heritage, ecosystem management, control of catchment area and water pollution, including removal of phumdis (floating islands). A press statement released by the fishermen's union said the LDA has been institutionalised for 10 years but it fails to mention
NHPC and its Ithai barrage, which are the main agents causing irreparable damage to Loktak's ecosystem and its people. "The LDA has been blaming the people of Loktak for polluting Loktak, however, the main problem is the solid and liquid wastes that comes from the streams and rivers, particularly Nambul river.

All kinds of biomedical waste, domestic waste, agricultural residues such as pesticides, fertilisers flow directly into Loktak. The LDA has been turning a blind eye and has done nothing about this issue," the statement added. "The LDA is polluting Loktak by their use of machineries like motorboats, dredging machines, and water master which leaks oil directly into the wetland," it said. The LDA had claimed it has finalised three long-term projects after it had completed the short-term action plan (Stap) for conservation of Loktak. It also claimed to have preserved the natural and cultural heritage, but they have illegally burnt down 777 phums out of 1,147 phumsang inside Loktak thereby directly threatening the unique cultural heritage, which is also a Ramsar site, countered the fishermen's union.

"The construction of the road through Loktak from Toubul to Mayang Imphal is another glaring example that directly threatens the lake. The proposed surface ring road of 80km will directly threaten the ecosystem of Loktak and affects food sovereignty. The people who depend on Loktak wetland have been surviving by locally conserving, managing and promoting the wetlands. The LDA must learn lessons from Loktak wetlands dependents," the statement said. The union urged the government to repeal the Loktak Protection Act, 2006, "as a contravention to the existing laws of the land and its equivalent to AFSPA" to save Loktak.

**Manipur: Reclamation of eutrophicated water bodies through EM Technology**


Manipur is dependent mostly on the rain water collected in the water reservoirs. The largest water reservoir in Loktak Lake of Manipur, which is highly eutrophicated (polluted) water body of the North East India. Besides in Manipur numerous small and mid sized ponds are also maintained by almost every farm. These water bodies serve fuel purpose of catching water during the dry season and fish farming. Most of the water bodies in valley of Manipur are getting water from the rains and this water contains a lot of organic matter, most of the times domestic effluents also mixed in this water. A study revealed that 90% of the water bodies in Manipur is having eutrophication. This is not only a threat to the aquatic life but also a potent health hazard for the humans due to the toxins released by the algae.

There was an article in the The Sangai Express, 4th May, 2018, titled “Large number of fishes perish in Nungleng Pukhri at Kangla”, which states the probable reasons for this fish death is lack of oxygen, high content of carbon monoxide, etc. Eutrophication is the enrichment of an
ecosystem with chemical nutrients, typically compounds containing nitrogen, phosphorus, or both. Runoff from agricultural fields, pollution from septic systems and sewers, and other human-related activities increase the flux of both inorganic nutrients and organic substances into terrestrial, aquatic, and coastal marine ecosystems. Consequences of eutrophication include excessive plant production, blooms of harmful algae, increased frequency of anoxic events, and mortality in fishes.

Economic losses attributed to eutrophication include costs of water purification for human use, losses of fish and wildlife production, and losses of recreational amenities. Eutrophication has become a global problem that is likely to intensify in coming decades because of increases in human population, excessive phosphorous from sewage, demand for food, land conversion, fertilizer use, and nitrogen deposition. When these algae die, they start decomposing and the nutrients contained in the organic matter are converted into inorganic form by microorganisms. This decomposition process consumes oxygen, which reduces the concentration of dissolved oxygen. The depleted oxygen levels in turn may lead to fish kills and a range of other effects reducing biodiversity.

Enhanced growth of aquatic vegetation or phytoplankton and algal blooms disrupts normal functioning of the ecosystem, causing a variety of problems such as a lack of oxygen needed for fish and shellfish to survive. The water becomes cloudy, typically coloured a shade of green, yellow, brown, or red. Eutrophication also decreases the value of rivers, lakes and aesthetic enjoyment. Health problems can occur where eutrophic conditions interfere with drinking water treatment. To address this problem of eutrophication and its related adverse effects like decrease in oxygen, formation of toxic gases like methane, ammonia, hydrogen sulphide, etc. EM Technology (Effective Microorganisms) from Japan is an innovative biological solution. EM Technology is been used worldwide in more than 140 countries for the last 30 years.

Maple Orgtech (India) Limited, having their Head office in Kolkata, is the authorized manufacturer of EM Technology in India. Their product MAPLE EM.1 AQUAMAGIC is the only answer to all these problems without the use of any chemicals. It is a complete microbial product and safe for the aquatic environment. Maple Orgtech (India) Limited has worked with many state governments, NGOs and Municipalities with their EM Technology and successfully restored many lakes and ponds. One such example is the restoration of Ulsoor Lake in Karnataka. Before Treatment After Treatment Maple EM.1 Aquamagic can be used in the Nungleng Pukhri at Kangla to reclaim the water body and maintain a healthy aquatic life through the use of EM Technology from Japan. This technology will help to increase the dissolved oxygen level which is cited as one of the key reasons for the fish deaths.

**Manipur: NERCOMP launches fish cage-culture in CCpur**

http://e-pao.net/GP.asp?src=18..240418.apr18
The North Eastern Region Community Resource Management Project (NERCOMP) today inaugurated a pilot project for boosting fish-cage culture in the State with the launching of a floating fish cage for aquaculture project at the man-made Khuga lake in Churachandpur. The project titled "Stiner initiative" is financed by the Ministry of DoNER, Gol. The cage culture, according to K Hrishikesh Singh, Director (admn) NERCOMP, is taken up with the sole intention to populate water bodies with fishes to increase production as the fish fry or fishlings have very little chances of survival without culturing. The cage-culture will raise the survival chances from a mere 40 percent to 70 percent. However, the real test of the project lies on the locals who will have to ensure that ethical methods of fishing are strictly adhered to and help sustain the plan; otherwise the very purpose of the project will be defeated, he said.

The visiting team headed by SN Pradhan, Jt Secretary Ministry of DoNER were accorded a warm reception on their way by NERCOMP and its NGO partners prior to the project launching event at Mata Mualtam, Churachandpur district. Dr Sailendra Chaudhari, Managing Director NERCOMP who also addressed the event maintained that the cage-culture project launched today and another one to be launched tomorrow at Ukhrul are an experimental one whose success and failure will determine the future policies of the ministry. They were the first such initiative DoNER has taken up in the entire North-Eastern region. SN Pradhan, meanwhile, explained the concept behind the introduction of cage-culture saying some good things can happen in a short period of time with the right technology, and the cage culturing is one such experiment.

Dr Ketaki Babat, Scientist and Principal Scientific Advisor to Government of India also spoke on the occasion. The Deputy Commissioner Churachandpur Shyam Lai Poonia while hailing the project reiterated the massive role to be assumed by the locals. The livelihood project will have enough for everybody's need, but not enough for everybody's greed. A massive crowd graced the event that was hosted by NERCOMP Churachandpur and its partner NGOs. The Project Directors of NERCOMP Ukhrul and Chandel also graced the event along with the SP Churachandpur and several other DLOs, reports our correspondent.

**Manipur: Make agriculture a fully viable occupation: VP :: 'Focus on pisciculture, aquaculture'**

http://e-pao.net/GP.asp?src=8..190418.apr18

Vice President M Venkaiah Naidu has asserted that agriculture should be made a fully viable occupation in all parts of India to boost the country's economy. He was speaking as the chief guest at the valedictory function of the "One-day State Level Workshop on Biodiversity and Sustainable Agriculture for Doubling of Farmers' Income", jointly organised by the Government of Manipur and Central Agricultural University at City Convention Centre, Palace Compound, Imphal East today. M Venkaiah Naidu also stressed on the need to practise agriculture in a
manner which may help in restraining global warming. Stating that the North East is gifted with good rainfall and vast water bodies, the Vice President said that the region should focus on pisciculture and aquaculture for economic development.

He also mentioned about boosting farmers' economy through large scale production of indigenous items like scented black rice (Chakhao), king chilli, ginger, turmeric, orange, pineapple etc., which are suitable to the soil of the State. In order to work towards this end, the State Government needs to put in effort with assistance from Central institutes like ICAR, IBSD, CAU and KVK etc, he added. Development bears no meaning if it does not reach each and every citizen of the State and the country, Venkaiah Naidu said while adding that enhancement of connectivity is a must to ensure development even at interior areas. Instead of discussing about issues, reasons and problems, one should focus on finding solutions, he said while adding that researchers should come up with ideas on training farmers and stakeholders, develop marketing and export strategies, establishment of value addition facilities and packaging etc.

The State Government needs to focus more on implementation and development to increase farmers' income, he added. He further said that Manipur is not a poor State but rich in different fields. People should learn to tap dividends from its potentials, the Vice President added. Stating that the Government of India has not undermined talents but recognised it, Venkaiah Naidu said that Mary Kom, Sanjita Chanu and Mirabai Chanu had done the whole country proud in the recently concluded Commonwealth Games at Gold Coast in Australia. And it is because of these talents that the Government of India had decided to set up the only National Sports University of the country in the State, he said while adding that size of any State does not matter but talent matters. He said that every citizen of the country should think India as a one Nation forgetting all differences of community, religion, region and language.

Chief Minister N Biren Singh attended the function as president while Governor Najma Heptulla, Deputy Chief Minister Yumnam Joykumar, Forest and Environment Minister Th Shyamkumar and Central Agricultural University Vice-Chancellor M Premjit attended as guests of honour. Governor Dr Najma Heptulla said that agriculture and allied activities are the mainstay of Manipur's economy as about 70 per cent of the people depend on it. Industrial growth in the State is very insignificant and the growth of agriculture in the State also has been quite uneven and unsatisfactory as it still depends on seasonal rainfall, she added. Stating that lack of connectivity and short working season are constraints on the economic development of the State, Heptulla said that the State is still lagging far behind other States of India in terms of availability of infrastructure for social and economic development.

Chief Minister N Biren said that doubling farmers' income would be possible only if the State can best utilize the vast untapped potentials of reservoir of resources present in major farming systems. He said, "We have large untapped area in the hilly regions. What we need is introduction of appropriate technology for these areas to increase productivity and make the
fanning system competitive and sustainable. We need to promote farming systems based on high value agriculture like horticulture and animal husbandry. Not only this, we need to adopt successful three-dimensional cropping as well as sustainable farming system involving crop - livestock-pisciculture integration." Ministers, MLAs, high ranking officials of the State and Central Government and scientists from different parts of the country were also present at the occasion. The workshop had two technical sessions.