Loktak lake, Bishnupur

Background

Loktak lake is situated approximately 38 km south of Imphal (the capital of Manipur) in the Bishnupur district of Manipur. It acts as a natural reservoir for the rivers and streams of the valley and hills in the state. Loktak is the largest freshwater inland natural reservoir in the eastern region of the country and has been identified as a major Indian wetland by the World Conservation Union (IUCN). The rich wildlife/biodiversity of this area had earned it the status of a Ramsar site of international importance in 1990. Loktak Lake also finds a mention in the Montreux Record, which is a record of Ramsar sites 'where changes in ecological character have occurred, are occurring or are likely to occur'.

All villages in the lake periphery are connected by road to Imphal via Bishnupur Bazar and Moirang on the western side of the lake, and via Mayang Imphal and Sekmai on the eastern side of the lake. The rainfall varies between 600 mm and 1600 mm (with an average of 1400 mm).

The ecosystem can be described as a wetland with north-south elevation (Imphal 790 mams; Loktak lake surface at present level 768.5 mams). About 36 feeder streams from the western catchment area flow into Loktak. The lake is characterized by the presence of a thick floating biomass locally called phumdi. A variety of plants and grass grow on the phumdi.

The lake is dotted with several small islands, the prominent ones being the Thanga and Karang islands, both inhabited. The 28896 ha Loktak lake area is actually not a single body but a composite of several separate wetlands, locally known as 'pats', which could earlier be easily distinguished in the lean season before the Loktak Hydel Project (see section on socio-economic changes) was initiated.

Besides the massive occurrence of phumdi, there is also a large growth of aquatic plants like ishing charang, kabo-kang (water hyacinth) and kabo-napi. In addition, there is now an extensive growth of choura, which is an introduced grass species originally brought in from outside the state as fodder for cattle and now found colonizing the phumdi. Choura has practically dominated other species occurring on the phumdi.

The open waterbody provides a habitat to migratory water birds in winter months, starting from October up to March-April. An area of around 5200 ha in the southern part of Loktak lake, inclusive of the Keibul Lamjao portion, was declared a wildlife sanctuary in 1954, but the area was later reduced to around 4050 ha and was declared a national park, called Keibul Lamjao National Park (KLN), in 1977 under the Wild Life (Protection) Act, 1972, and the Manipur Wild Life (Protection) Rules, 1974.

In addition, the state forest department (wildlife wing) has proposed the adjoining area of Pumlen Pat (approx. 2200 ha, located on the south-eastern side of Loktak Lake and across the eastern bank of Manipur River) as a bird sanctuary.

Vegetation growth like tou, singnang and singmut in the park area provide shelter to various species of wildlife including the sangai or swamp deer, kharsa or hog deer, lamok (wild boar), sanamba (common otter), moirang sathibi achouba (large Indian civet), moirang sathibi macha (small Indian civet) and kak-thenggu (Malayan box turtle) among others.

There are approximately 55 suburban and rural settlements within and around Loktak Lake. The predominant community is meitei (both Vaishnavite Hindus and orthodox meiteis) with a sparse population of meitei Christians and meitei Pangal (Manipuri Muslims) living in separate pockets.
around the lake. There is also a small population of kabui (rongmei tribe) in Toubul village near Bishnupur district headquarters on the western side of the lake.

It is estimated that around 30,000 people depend on fishing for their livelihood in the lake area. The number of hutments constructed on the phumdis is estimated to be more than 1000, with a rough population of about 4000 individuals. The total human population in Bishnupur district according to the 1991 census is 1,80,773 with a density of 364 persons per sq km.

The primary sources of income of the local people have been traditional agriculture and traditional fishery phum-namba. Income is also derived from sale of locally produced vegetables such as cabbage, cauliflower, potato, brinjal, ladyfinger, parkia (tree bean), and dry and fermented fish, fermented bamboo shoots, edible plants and roots from Loktak lake, water-reed mats, etc. More recent forms of income are modern fishery practices, large-scale farming with modern equipment and technology, small-scale businesses, transport businesses with cycle-rickshaws, auto-rickshaws, jeep taxis, minibuses, shops, restaurants, and employment with the government at different levels.

After the commissioning of the Ithai barrage on the Manipur River in 1979, as a part of the National Loktak Multipurpose Project (officially commissioned in 1983), an artificial reservoir was created. This resulted in permanent rise in the water level of this wetland, coupled with a vast water spread throughout the year. The natural flow of water to and from the wetland was severely altered by the creation of the barrage, affecting the hydrologic cycle of this delicately balanced system.

The barrage constructed to create the artificial water reservoir for the Loktak Hydroelectric Project (LHEP) maintained a constant water level at 768.5 mamsl (in peak season during the monsoon, the water level is maintained at 769 mamsl). This level of water surface has resulted in huge tracts of settlement and agricultural lands getting either submerged under water permanently or inundated at regular intervals through the year whenever there is continuous heavy rainfall (3-5 days).

The effects of this on the local wildlife and people include:

1. Fish farms in the lake periphery owned by local farmers are constantly affected by flash floods or sudden rise of lake water level during periods of heavy rains, often resulting in heavy loss of fish.

2. The KLNP in the southern part of the lake has suffered extensively as a result of raised water level. The entire Park area is subjected to frequent and regular flash floods, especially in the monsoon months.

3. Back-flow effect of the Khuga River through the Ungamel channel towards the south of KLNP has had adverse impact on the national park. Sudden water rise in the river after continuous rainfall for up to 4-5 days hits the southern portion of KLNP with great force, and as a result the floating biomass is ripped apart and the loose vegetation drifts off. This not only reduces the vegetation cover in KLNP but also endangers the wildlife inhabiting in the Park. Occasionally, it has been reported that wildlife like wild boar, hog deer and sangai were found to have strayed out of the Park area on this drifting biomass and into human habitations, sometimes causing injury to humans. Poachers take advantage of such situations to capture the wildlife.

4. A sharp increase in the number of fish culture ponds that has led to a profusion of vegetation mass, depleting the areas which were earlier clear water zones. Clear water zones are essential for the local people to meet basic water needs such as drinking, washing, bathing, sanitation, etc.

5. On construction of the barrage, those people who earlier eked out a living through tilling the soil started fishing, thus putting pressure on the already depleting aquatic resources.

6. Decreased fish catch has forced the fishermen to employ different techniques of fishing, such as using closely knitted plastic nets of varying sizes and thickness bought from neighbouring Burma. There is also an apparent increasing competition and tension amongst the fishermen for the right to access particular areas of the lake. Fishermen are noticed to have put up bamboo poles to demarcate their 'land' (i.e., waterbody) inside the lake.
7. The increase in the proportion of floating vegetation mass, while causing undesirable impact such as the decrease in area of clear waterbody and affecting spill-over in lake shoreline areas, is also encouraging an increase in undesired human activity such as the increase in number of hutments, disturbances in the waterfowl habitat area (such as instances of poaching, poisoning of the birds, collection of eggs, etc.), and obstruction in the traditional waterways. Massive phumdi build-up is also causing blockage in the waterways used by the locals for traveling in their dugout canoes from place to place across the lake.

Towards community conservation

The conservation efforts by the local communities are spread over different localities of Loktak lake surface area. Legally most of the area under community conservation falls under the jurisdiction of the Revenue Department of Manipur, which includes settlements, agricultural lands and fish farms in the lake periphery.

The areas where community conservation is active are:

- The Birahari Pat Migratory waterfowl habitat (approximately 400 ha waterbody). This area is located around 2-3 km offshore from the Khoijuman village on the western side of lake. The single largest population of waterfowl seen here is the Uren porom (Common Coot);
- Keibul Lamjao National Park (KLNP) (4050 ha on the southern end of lake);
- Lake shoreline fish farms (Migratory waterfowl habitat, approx. 4-5 hectare area, covering around 4 to 6 km area in length) and adjacent waterbody in Nongmaikhong and Khordak village areas (on the south-eastern side of lake and also south-east of KLNP). This area is outside the KLNP but in its immediate proximity. Around 14 species of waterfowl and avifauna have been sighted in this area. Some of the species are nganu thanggong (Ruddy Shelduck), nganu khara (Northern Shoveller), thanggong mal (Eurasian wigeon), iruppi (ferruginous pochard), tharoichabi (Asian openbill), meitunga (northern pintail), nganu pirel (spotbill duck), thoindingam (gadwall), utsai saingou (grey heron), tingi (lesser whistling teal), etc.

The distance between the Nongmaikhong-Khordak community initiative area and the proposed bird sanctuary at Pumlen Pat is less than half a kilometre, separated by the Manipur River. Pumlen Pat is similar in its features to Loktak lake. The migratory waterfowl feeding in the Nongmaikhong-Khordak area rest at Pumlen Pat at night.

The Loktak lake is associated with folk legends and cultural beliefs of the Manipuri people. The religious temperament of the people finds expression in the different religious worships and folk art performances, such as the projection of the Loktak Lake as the ‘mirror of Manipuri civilization’.

The sangai is a legendary beast (as embodied in the form of Kangla Sha, which is the official emblem of the Manipur government) is best explained as the representative cultural and social identity of Manipur. The sangai is also the official state animal of Manipur. That is one of the reasons that the conservation of the sangai and its habitat has been stressed upon by the local people. Another reason is that it is today a precious asset of the state, found nowhere else in the world. The sangai population had reduced to about 14 in 1974 in the state. According to a survey in February 2003 there are now claimed to be 180 of them.1

The alarming results of the LHEP led to the initial stirrings of the need for conservation among some locals and environmental groups in the mid-1980s. They (mainly the meiteis) realized and decided to react to the undesired developments in the lake, which were detrimental to the health of humans, wildlife and the lake ecosystem.

In the years following the commissioning of the Ithai barrage of LHEP, the local people living in the lake area rose in agitation against the adverse impacts of the barrage, such as the artificial flooding of their settlement lands and loss of their paddy fields. This mass movement ultimately forced the Manipur government to set up the Loktak Development Authority (LDA) to address some of the problems. However, the government neither had a concrete plan for conservation of the lake ecosystem nor for the wildlife.

The vacuum created by the lack of a government policy on conservation of the wildlife was felt by the local people living in the immediate vicinity of the KLNP, where there were several cases of poaching and unnatural deaths of wildlife such as by drowning. This provided the impetus to the local people to do something positive for the deteriorating conditions of the lake and the wildlife.

Around 1991, some of the concerned individuals and non-governmental organisations met and decided to form a collective body for the cause of the lake and the wildlife dependent on the lake. They formed an association called Environmental Social Reformation and Sangai Protection
The issue of protection and conservation of the much-revered sangai and the other wildlife living in KLNP including the migratory waterfowl, and the health of the lake, which is the source of life and reverence for the people, were the thrust of the campaign. The initiative progressed slowly yet steadily. It gradually picked up from a few individuals’ concern to a mass movement all along the lake shoreline by the mid-1990s.

Grassroots-level public meetings, nature camps, workshops, etc. were organized by ESRSPF to spread the message of the need to conserve the Loktak lake biodiversity. The locals received help from Imphal-based environmental organisations, like the Manipur Association for Science and Society (MASS), and experts from the Manipur University, Dhanamanjuri College of Science and others. Efforts to highlight the plight of Loktak lake were made through various means like loud protests, writings in newspapers and magazines, projection in films and video, ballads, lectures, etc. at local, regional, national and international levels.

An annual ‘Loktak Day’ celebration is organised each year in October in places like Thanga, Komlakhong and Nongmaikhong to highlight the conditions of the lake and the need to conserve it. As a part of the celebration, meetings, seminars and cultural programmes are organised. Although organised at the people’s level, this celebration has a political overtone in the sense that potential politicians based in the Loktak lake area take the leading part in the celebrations.

Important conservation sites were identified by the locals themselves and with support from the ESRSPF; these were subsequently decreed as ‘protected areas’ by a consensus of the local communities. Local youth clubs and voluntary organisations together decided to monitor the areas for possible violations, such as poaching, unauthorised entry into the national park, setting fire to dry vegetation, etc. ESRSPF also set up units in critical spots like Keibul Lamjao, Nongmaikhong, Thanga and Bishnupur. Since then, the entire locality, including youth, men and women, involve themselves in the conservation of the specified areas.

In this way, several of the villages located around the southern parts of the lake joined in a common effort to protect and conserve the KLNP and other adjoining areas that are important wildlife habitats. Likewise, villages like Khoijuman located in the upper portion of the lake, and Nongmaikhong-Khordak in the south-eastern part of the lake took up efforts to conserve the migratory waterfowl habitat in the Birahari Pat. Most of the conservation occurs on privately owned lands or water body area, not necessarily controlled by government agencies.

Local voluntary organisations under the banner of ESRSPF feel responsible for protection, conservation and preservation of the Loktak Lake and its biodiversity. Government agencies like the forest department and the Loktak Development Authority are much indebted to the services of the ESRSPF volunteers in the protection and conservation of the wildlife and their habitats in KLNP and surrounding areas.

In fact, where the forest department had failed to mobilise the locals for effectively controlling poaching in KLNP, it has been due to the untiring efforts of the ESRSPF volunteers that poaching in KLNP and in other parts of Loktak Lake has been greatly reduced in recent years.

On 19 January 2003, ESRSPF volunteers nabbed two poachers who had hunted sangai deer inside KLNP. They were apprehended with around 4 kg of chopped deer meat, which the poachers obviously intended to sell clandestinely. Both the poachers are from the Keibul Lamjao village. Both of them were later handed over to the Moirang police station and a criminal case was registered against them. Such activities serve to discourage potential hunters.

The conservation effort finds some amount of opposition from some of the primary stakeholders, such as the local women who gather edible roots, plants and fodder grass from within the KLNP, and fishermen whose fishing activities are restricted in those areas where the initiative is quite active, like in the Birahari Pat area.

Although the status of a national park restricts locals from freely entering the core zone area of KLNP, due to absence of proper demarcation of core, manipulation and buffer zones, some sort of compromise has been made with the locals who traditionally collect plants for food and fodder from
the KLPNP, and certain concessions are granted to the local people to enter and collect dry vegetation and edible plants and roots from within the enclosure of the Park and in the surrounding areas.

When the national park came into force in 1977, there was strong opposition from the local people when they were not allowed to enter the Park area and continue with their traditional practice of collecting food and fodder plants. The tendency is still there in the sense that though there has been some amount of understanding between PA managers and local people, the people here, particularly the women, feel a certain resentment at the manner in which they are stopped from continuing with their traditional practice, even when the forest department does not have any management policy to regulate entry or allow people to enter up to a certain point in the Park. The author has seen forest guards challenging women who had entered right up to the core area to collect edible roots in March-April (this is the time when poaching inside the Park is most active). This sort of act also causes tension between PA managers and the local people. However, intervention by ESRSPF volunteers by way of organising meetings and talking to the people has helped to reduce such tensions as and when they arise.

In the Birahari Pat conservation site, there is a certain amount of opposition from local fishermen when they are asked not to disturb the migratory waterfowl, particularly during their winter resting months. The opposition, though minimal, has arisen from the local fishermen's need to cover a large part of the lake for their fishing activities. This has been because the fish catch seems to have gone down in the past few years. In fact, fishermen are resorting to the use of close-knitted nylon nets to catch small fish (even fingerlings) since they are unable to catch big/bigger fish in the lake.

There are also instances of conflict from adjacent communities who continue poaching/hunting avifauna and waterfowl. In some of the poaching cases, it was found that some of the poachers belonged to a different community from nearby Kwakta village, which is located about 4 km west of Moirang town. Poaching is carried out in connivance with a few local persons living in the KLPNP area (e.g., the two poachers recently caught are both from the KLPNP area). Poachers are known to hunt the birds (and animals) and sell them to vendors in places like Kwakta, Moirang Lamkhai and Imphal to supply restaurants, hotels, etc.

In the case of a poacher being caught red-handed by the locals in the KLPNP area, he is immediately handed over to the range officer of the Keibul Lamjao Forest Office. Then a meeting of the locals from the village (Keibul Lamjao, and sometimes attended by villagers from neighbouring Chingmei village), including the gram panchayat members, ESRSPF, forest officers and other important persons in the village is held to discuss the situation. Normally the meeting is organised at the Forest Range Office in Keibul Lamjao immediately an offence takes place. In most instances, the cases are settled at the grassroots level itself without the intervention of the police or the district magistrate. The collective meeting of these representatives decides on the nature of the penalty to be awarded to the poachers.

The nature of penalty differs according to the extent of offence committed. The poacher is either given a good thrashing and let off after a stern warning not to repeat his crime again, or the poacher is made to pay a fine of Rs 10,000 (this amount was announced by the ESRSPF as penalty to any person caught hunting sangai). In some cases, depending on the seriousness of the crime, the poachers are handed over to the police for legal proceedings (but the locals are wary of such legal proceedings because they feel nothing comes out of it).

Sometimes the penalty is harsh. If the matter is taken up by an underground group (it may be noted that a certain underground group had earlier announced that it would award capital punishment without trial to anyone found/caught hunting sangai), the poachers are liable to be shot. The two poachers caught by ESRSPF volunteers on January 19 were punished by being shot on their right thighs by the underground Revolutionary People's Front as a (last) warning to anyone daring to defy the group's decree. (This incident happened on February 5, 2003 after both the poachers were given bail by the Chief Judicial Magistrate of Bishnupur district). In 2003, another valley-based Meitei insurgent group announced prohibition on hunting migratory waterfowl. They also announced a punishment if the orders were violated.

In an incidence in 1999, a Kabui, also the headmaster of a local junior high school in Toubul village, was apprehended with a gun and birds in his possession by volunteers of the Global Science Club (GSC), Khoijuman. A meeting was held in Toubul village attended by the village authority, GSC and ESRSPF members. In the meeting, the headmaster confessed his crime. Later, he was pardoned on the condition that from that day onwards he would stop hunting birds and would become a member of the GSC. He thus became a converted wildlife activist. This was an achievement for the local conservationists.

The existing institution at the village level is the gram panchayat headed by a pradhan (village
head), assisted by the *upa-pradhan* (assistant to the village head) and members in the management and administration of the village affairs. It is an important instrument for garnering support of the local people and for dealing with matters concerning the activities of the local community as regards the conservation initiative.

As in Nongmaikhong area, the *panchayat* members (earlier headed by former *pradhan* Salam Budhi Singh) are quite active in the protection of the migratory waterfowl in the winter months and for securing the support of local farmers to conserve their habitat. In the process, the farmers are losing much of their source of income by letting the waterfowl feed in their fish farms while foregoing all activity of fishing themselves.

In fact, there is a perpetual question of who will compensate them for the loss they are suffering for the sake of the waterfowl. Farmers like Salam Budhi and a few others had voluntarily forsaken the use of around a hectare each of their fish farms so that the waterfowl are not disturbed. Currently they are losing fish yield from more than four hectares of fish farms in Nongmaikhong village area.

As so far observed, these farmers are sacrificing themselves purely for the sake of the birds, who, they say, are visitors from far-off places and who need their protection to feed and roost without fear and disturbance. So, for the best part of December, January, February and March, these farmers have to look for alternative sources of food and income while forgoing much of their fishing activities in this area.

The women usually make water-reed mats and smoke small fish for sale to earn a living, while the men engage themselves in farming activities or weaving bamboo baskets for sale, or go out deep into the lake to fish so that minimal disturbance is caused to the waterfowl habitat. However, during a visit in mid-January 2003, fishing activities were seen in the migratory waterfowl habitat. Although the activity was minimal, this is evidently a result of the pressure on the farmers for their livelihood needs.

For all the activities mentioned above, no formal rules have been laid down (barring the imposition of fine on killing sangai). The initiative is based on a mutual understanding of the different village communities and has been voluntarily taken up rather than through compulsion. Such a loose structure and informal understanding has its own drawbacks, as it creates confusion particularly when there is a conflict of interest and ideas among the different village communities regarding the handling of particular cases.

Disputes, offences and other matters are dealt with by the *panchayat*, and in the case of non-settlement of the issue at the village level the matter is recommended to the district magistrate for due settlement. In most cases, petty matters are settled at the village level itself and the villagers are ‘urged’ to comply with the *panchayat’s* decision(s). However, in most cases, it is the collective decision of the villagers rather than the decision of the *panchayat* which is the final say.

This mechanism of governance at the grassroots is quite effective in the sense that the decisions are made by the people themselves for their own good. In case of disregard of that collective decision, the offender is likely to face pressure from the entire community.

There are also some Government interventions in the area. For example the Loktak Development Authority (LDA) was set up in 1987. LDA’s effort has been to work on improving the water quality of the lake, controlling the ever-expanding vegetation matter, weeds, etc., and to establish rapport with the local communities in working out a common strategy for the overall conservation of the lake ecosystem. Earlier, LDA’s activities primarily were mainly engineering related, like dredging of silt and clearing of vegetation matter from the lake. These activities initially attracted stiff opposition from the local people because there was no consultation with the local people. Ever since LDA has changed its strategy, it has received support from the local communities in conducting public awareness campaigns, nature camps, workshops, seminars, etc. towards the purpose of conservation of the lake ecosystem.

Although the forest department (FD) also has jurisdiction in the area, they do not have any concrete comprehensive plans for the area.
**Impacts of community conservation**

Where the Government had failed to establish rapport and a meaningful control and management of the Park, the community was successful in bringing about a semblance of law and order in the protected area. There have been several occasions when the ESRSPF launched a local-level agitation against the forest department to protest against the inactiveness of the Department towards the conservation of the sangai habitat, or to protest Loktak Development Authority’s undesired engineering activity in the lake. However, Forest department officials do get support from ESRSPF and other organisations during sangai census, control of poaching, etc.

There have been no direct benefits to the local communities as a result of their initiatives, except for the small financial assistance from LDA for public motivation campaigns and community welfare programmes like raising fish hatcheries, social forestry, community toilets, welfare schemes for women, etc. The only benefit gained is the sense of pride in achieving some degree of success in conserving the wildlife habitat and population, even though it is in the initial stages.

The initiative has been successful in achieving a more concerted effort towards preventing poaching of sangai and other wildlife in the KLNP area. Over the last five years an increase has been noticed in the numbers of migratory waterfowl coming to the area, and the population of wild boar in the KLNP has also increased.

**Opportunities and constraints**

Some initiatives create certain problems, such as the waterfowl habitat conservation in Birahari Pat and Nongmaikhong-Khordak areas, where the local fishermen have to stop their fishing, as it puts pressure on the conserved area. They then have to seek other alternatives to earn their living. Especially after losing their agricultural land as a result of the Loktak Project, the farmers find it hard to forsake their fish farms. For them, it is just like becoming landless.

In a sense, it is the Manipuri sense of hospitality to visitors that seems to be at work here. Despite the hardship of forgoing their source of livelihood, the farmers in Nongmaikhong say that it would be thoughtless and heartless for them to drive away these winged visitors from faraway places who had come to feed and roost here for the best part of four months. Although, as Salam Budhi says, their families have to suffer on account of the waterfowl, they will continue to provide shelter to the migratory waterfowl.

In the late 1980s the government set up a State Environmental Council chaired by the governor and members consisting of representatives from the various government departments with a few representatives from the public to look into the matter of environmental issues in the state. But the council got defunct in 1991, and has not been revived till date. In the absence of such a mechanism, initiatives by local communities for the conservation of Loktak lake’s biodiversity has often clashed with interests of the government agencies like the forest department, LDA, Fisheries Department, Irrigation & Flood Control Department, etc.

Unauthorized pattas (land ownership deeds) have been given to some people by the Bishnupur District Revenue Office in areas which are part of the lake waterbody (i.e., the patta land is under deep water!). This has given rise to conflicts between local conservationists and local fishermen over the right of entry and activity in areas of waterfowl habitat (such as in the Birahari Pat area).

Another development has been the ‘intrusion’ of politicians to gain political mileage from the people’s campaigns. In fact, ESRSPF’s initiative recently took a political colouring with some activists harping on the people’s movement to gain support for their elections to the state assembly. There have since been efforts to restrict such overtures by aspiring politicians, and care is taken to keep them at a distance.

Frequent fighting between wild boar and sangai (and perhaps hog deer too) for food and shelter has been reported by the patrolling forest guards (this is caused by the decreasing vegetation cover and edible plants, etc.). Sometimes, wild boars have strayed out of the KLNP area and caused havoc in the nearby villages, damaging standing crops and injuring people. The responsible government agencies have no management plans to prevent such incidents. The local youth clubs and other voluntary organisations under the banner of the ESRSPF have taken it upon themselves to keep a watch-out for such mishaps.

ESRSPF had assisted the LDA in conducting a 3-month-long flora study and data compilation of the vegetation mass in KLNP. ESRSPF, in association with environmental groups, conducts periodic monitoring and study of the wildlife including annual migratory waterfowl and sangai census. Other than this, local organisations like Global Science Club (Khoijuman), Generation De New Image.
(Ningthoukhong), Loktak Lake Environmental Development Organisation (Thanga), etc. conduct periodic studies of the wildlife habitats, the lake’s ecological character, etc. and interact with the local communities on their findings.

**Conclusions and recommendations**

Suggested recommendations for effective conservation:

- Government agencies such as the forest department, the Loktak Development Authority, the Fisheries Department, the Rural Development & Panchayati Raj Department, the Social Welfare department, the Health & Family Welfare Department, etc. should coordinate with each other to initiate welfare programmes for the local communities with the objective of encouraging the locals towards Loktak lake biodiversity/wildlife conservation.

- Set up scientific study cells to monitor the Loktak lake ecosystem, periodic and regular water quality monitoring, study of hydrology of lake and feeder streams, change in vegetation character, wildlife behavior, etc.

- Set up a coordinating body of the local communities and government agencies to work on a mutually accepted module of policy strategy and conservation methodology, and so on.

This case study has been contributed by Salam Rajesh, an independent researcher, in 2004.

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iii) Laishram Shamungou, Khoijuman Mamang Leikai, P.O. Bishnupur Bazar, Bishnupur district, Manipur

iv) Oinam Birathoi (phum hut dweller), Birahari Pat off Khoijuman village, Bishnupur district.

**Relevant government office(s)**

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iv) Global Science Club, Khoijuman Mamang Leikai, P.O. Bishnupur, Bishnupur District, Manipur.

v) Generation De New Image, Ningthoukhong Bazar, P.O. Bishnupur, Bishnupur District, Manipur.

vi) Loktak Lake Environmental Protection Organisation, Thanga Khunjen Leikai, P.O. Moirang, Bishnupur District, Manipur.

vii) Phum Hut dwellers of Birahari Pat area, Bishnupur District.

**Endnotes**


2. The underground groups in Manipur are demanding political autonomy for the state and have gone underground to evade persecution.