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## Himalayan Newt and Climate Change: A Case Study at Zaimeng Lake, Manipur

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#### ABSTRACT

Our study indicates the potential for conservation of nature and biological diversity at Zaimeng Lake. The lake is situated at an elevation of 2196 m above mean sea level. Himalayan newt, the only known amphibian species present at Zaimeng Lake is under threat due to changing rainfall patterns besides continuing pressure from developmental activity. At present, destruction of forest has resulted in the reduction of its capacity to absorb carbon dioxide. Himalayan newt is the only primitive species amongst living Salamanders.

Keywords: Himalayan newt, Zaimeng, climate and primitive.

#### **History of Zaimeng Lake**

Zaimeng means '*puzzle*' in Liangmai dialect. The Lake is situated at Khongtheng mountain ranges which is about 4km walk on the eastern side of Thonglang akutpa village. The village is located about 22 km from Kangpokpi Bazaar (NH2) and 44.5 km from the capital city Imphal. Historically, the name Zaimeng was given by their forefathers who lost the way in the vicinity of the lake and could not find their way out as they kept returning to the same spot around the lake. Different varieties of floral species like Kalakbang (*Michelia champacca*), Maga (*Phoebe hainensenia*), Zaimeng rapen (*Magnolia* spp), Karangbang (*Quercus* spp) etc. are growing in the surrounding environment. The forests have good undergrowth of shrubs and climbers including the bamboo species Chaki (*Arundinaria munro*) which add to the structural diversity. The forests do experience low to moderate biotic pressure in the form of fodder and firewood collection by the villagers and as a grazing ground for their cattle. Morphologically, Zaimeng lake has a resemblance to the Keibul Lamjao area of Loktak lake where a large part of the lake is filled up with *phumdi* (a heterogeneous mass of vegetation, soil and organic matters at various stages of decomposition). There is a belief that the lake is guarded by two unseen bird that cleanse the lake thereby no leaves or dirt are ever found in the lake. It may be noted that Zaimeng Lake is the catchment of two important rivers of the state namely, Irang river in the western part and Imphal river on the eastern part.

#### INTRODUCTION

*Tadui taku* is the Himalayan newt in Liangmei dialect. The species is dark brown, slow, tiny and gentle with calm behaviors. The scientific name of Himalayan newt is *Tylototriton verrucosus* belonging to family Salamandridae. The amphibian is listed under the endangered category of the India Wildlife (Protection) Act of 1972. Several species of newts and salamanders are philopatric and show limited locomotory capacities (Joly

and Miaud, 1989). Presently, the result of climate variability and change is disturbing the ecosystem services of Zaimeng Lake. Himalayan newt is showing sign of vulnerability as a result of climate change. Deforestation is causing forest fragmentation and loss of habitat which may lead to the decline of floral and faunal diversity in the vicinity of the lake. The disturbances of environmental factors imbalances the natural climate leading to global warming by increasing the carbon dioxide level and decreasing the oxygen percentage in the atmosphere. At the landscape level, environmental impacts generally occur in the form of alteration of land features and fragmentation of biological habitats leading to isolation of floral and faunal population. Fragmentation of habitat into smaller patches may limit animal mobility leading to loss of available habitats in the surrounding environment. Himalayan newt is a representative of a basal clade within extant newts (Pyron and Wiens, 2011), known to capture prey on land by lingual prehension but was hypothesized to lack the ability to feed in water (Miller and Larsen, 1989), though spending a reasonable time in aquatic realms during its breeding season (Dasgupta, 1996; Thorn, 1968). The morphological analysis of Himalayan newt revealed that considerable amount of consumed aquatic organisms (Dasgupta, 1996) and consequently it is likely that they capture prey in water at least during the breeding season. The amphibian need right temperature, moisture, and light levels in order to survive. Even small changes in environmental parameters can affect the reproduction and survival of the species. As investigated, the actual conservation status of this species has not been systematically known. The lack of precise information of life history, morphology and distribution prevents the formulation of any long-term conservation action plan.



Zaimeng Lake



Himalayan newt at Zaimeng Lake (Photo courtesy: Ashem Rahul Singh)

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#### DISCUSSION

Little information is known about the distribution, ecology and population biology of Himalayan newt. The Wildlife (Protection) Act, 1972 listed the Himalayan newt under the endangered category only to protect the animals against wildlife trafficking. The amphibian protection is argued by Kumar et al. (1996) that the prioritisation of species often does not reflect the real degree of threat that the species are exposed. As discuss, the main principal problem of Himalayan newt is the loss of habitat and fragmentation. Precise information on distribution within India is available only for the Darjeeling District of West Bengal (Dasgupta, 1990). The presence of Himalayan newt is Eastern Himalayas is also reported by Mansukhani et al. (1976) from Aruchanal Pradesh, Selim (2001) provided data for Manipur, while confirmation is needed for the presence of the species from Sikkim and Meghalaya. The Directorate of Environment, Government of Manipur has undertaken several initiatives to preserve the habitats of Zaimeng Lake at present. It is also important for various stakeholders along with the local community and the corporate sector to come together for an effective management plan. Active management and monitoring of Zaimeng Lake over a period of time is essential. In addition, the lake is important feeding, breeding and drinking areas for wildlife and provides a stopover place and refuge for bird species. As with any natural habitat, lake is an important part in supporting species diversity and has a complex and important food web.

#### CONCLUSION

The need of the hour is to get information on climate disasters and other geo physical parameters like rising temperature, erratic rainfall or sudden flash floods etc. The State of Manipur is taking the repercussions of climate change seriously at present. Himalayan newt, the amphibian is distributed mainly in the high altitudes and cold climatic regions of the eastern Himalayas. Therefore, preventive measures must be taken up to conserve the dwindling population of Himalayan newt at Zaimeng Lake which becomes shallow during the winter season of the year. Destruction of habitats and reduction of species diversity can make ecosystems more vulnerable to invasive species and indirectly affect human health and well-being. Biodiversity affects the climate mainly through regulation of the amount of carbon dioxide in the atmosphere. It is hoped that the reports and technical inputs from the Forest Department officials, Academicians, Researchers and Nature lovers will help the Environment Department and other relevant Departments to take appropriate actions for the conservation of this rare wetland located in the far reaches of the hill range.

Note: Liangmai = a tribe name, Khongtheng = name of mountain ranges, Thonglang Akutpa = village name, Keibul Lamjao = name of only floating National Park of Manipur

(All floral name are in local Liangmei dialect)

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