

MAINTENANCE OF NATURAL ENVIRONMENTS IN INNLAY LAKE

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Abstract

Innlay lake is located in Nyaungshwe township (at the joint area of Pang Long and Phae Khon) of Taunggyi district in southern Shan state, Innlay lake is a cultural heritage and it is the second largest natural fresh water lake in Myanmar next to Inndawgyi lake of Mohnyin district in Kachin state. Innlay lake flows into Moebye tank through Bilu creek. Hè-ya Ywa-ma is the large village which were first founded at Innlay region. The Innlay lake is the ASEAN Environmental Conservation Area and the second largest fresh water lake of Myanmar.

Keywords: natural resource, cultural heritages, conservation

Introduction

Innlay lake is located in Nyaungshwe township (at the joint area of Pang Long and Phae Khon) of Taunggyi district in southern Shan state, over 2900 feet above the sea level. It is located between latitude 20° 15' and 20° 45' north, and longitude 96° 49' and 96° 58' east. Innlay lake is a cultural heritage and it is the second largest natural fresh water lake in Myanmar next to Inndawgyi lake of Mohnyin district in Kachin state. The Scholars estimate that Innlay lake has been existed since over 10 millions ago. In order to maintain and perpetuate the Innlay lake, maintenance works were carried through the ages. In 1937, Department of forestry formed the Land Maintenance Committee and carried out the preventive works of soil erosion. For the sufficiency of foods, establishment of nursery of forest, were implemented in cooperation with the international organizations including the Food and Agricultural Organization (FAO), the United Nations Development Program (UNDP), and Japan-based Karamosia.

Maintenance of Natural Environments in Innlay Lake

Innlay lake is located in Nyaungshwe township (at the joint area of Pang Long and Phae Khon) of Taunggyi district in southern Shan state, (*Burma* (Myanmar)(2006) Insight Print Services Limited, Singapore, 2006, p. 251) over 2900 feet above the sea level. It is located between latitude 20° 15' and 20° 45' north, and longitude 96° 49' and 96° 58' east. (Daw San San Myint(1998) Universities' Historical Research Center, Yangon, Universities Press, 1998, p. 61)

Natural resource

Innlay lake is a cultural heritage and it is the second largest natural fresh water lake in Myanmar next to Inndawgyi lake of Mohnyin district in Kachin state. But Innlay lake is more well-known than the Indawgyi lake and it is an extraordinary shallow natural pond which located at flat area on hill region located to the southernmost of the Maw Shans' region. Innlay lake is included among the three old *Inn* (Natural pond) located in the Shan state. The three old natural ponds are Ho-pone Inn, Hèho Inn and Innlay lake. (Daw San San Myint(1998) Universities' Historical Research Center, Yangon, Universities Press, p. 61)

Innlay lake is said to be lowered than the present water expanse at the time 100 years ago. The area of the water expanse is originally 190/100 square miles, but nowadays, it is reduced to

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only 60 square miles in rainy season and just about 40/24 square miles in summer. The widest area is formerly 8 miles in width and now it decreased to 4 miles. (Maung Aung Mon, (1985) *Tharr-chin Doh A-kyauing Ta-sae Ta-zaung*), Yangon, Sarpay Beikman Press) In some records from journals, different measurements are found. For example, a record stated that Innlay lake is 12 miles in length and 4 miles in width. Another record mentions that it is 17 miles in length and 4 miles in width. It is also found that the Innlay lake is 22 kilometers in length and 11 kilometers in width respectively. (Waiyanphyo)

Throughout the life span of Innlay lake, it is known that the lake had the least water in summer of 2010 and in several places, dry of water reached record. The watershed area of Innlay lake is 2166.8 sq.mls in area and there are 29 creeks including two main creeks which flow into the Innlay lake. The main creeks which flow into Innlay lake are (a) Nan Let Creek (North) and (b) Bilu Creek (West). The watershed area of Nan Let *Chaung* (Creek) is 128 square miles in area and watershed area of Bilu *Chaung* is 302 square miles in area. (Tint Moe Thuza(2007) *Sediment Input into Inle Lake*, Ph. D. Dissertation, Department of Geography, University of Mandalay, p. 1)

Bilu *Chaung* has its source at Pinlaung township and passing over western hills, it flows into the lake near the village of Inntein. (Jessie Nyo Win Aung (Taunggyi), NYI-USA, *Beauty of Innlay*, Internet) Moreover, *Thaè-phyu chaung*, *Yei Oo chaung*, and *Nga Hmyang chaung* also flows from the west. Similarly, there are 29 creeks which flow from the eastern mountain ranges, namely *Yay-kyau chaung*, *Namt-thi-da chaung*, *Shwe-lin-pan chaung*, *Nam-yin-mu chaung*, *Chaung-sauk chaung*, *Pha-ya Ni chaung*, *Pann-tin chaung*, *Namt-li chaung*, *Yay-mu chaung*, *Hè-khan chaung*, etc. of which 17 creeks flow from the east and eleven creeks flow from the west and one creek flows from the north. Moreover, Innlay lake flows into Moebye tank through Bilu creek. The watershed areas of Moebye tank including Bilu creek is 2500 square miles in area. (Maung Maung Chit Oo, 2012, 1)

Inn is the pond in large extent that naturally appeared. But whether Innlay region is the pond naturally emerged or not and when it came into existence cannot be described exactly. By the concept of geologists, the Shan plateau is the area rich of limestones. Due to incessant rains, some areas which were eroded by the currents became valleys which are called "Limestone Pond". Some scholars said that the cracks on both sides of Innlay lake lowered and block faulting appeared. (Maung Maung Chit Oo, 2012, 2) The scholars estimate that Innlay lake has been existed since over 10 millions ago. (*San-pya Loke-thar-mya A-pan-phyay Sa-khan* (1966) (Resort station for Model workers) *Innlay Directory*, Yangon, The Union of Burma, Revolutionary Government, Office of Labor Directorate, , p. 52) At that time, Innlay lake was 3000 feet above the present land surface. The present expanse of water of the Innlay lake is not like the geographical condition of previous time when the lake was 36 miles in length and was 8 miles in width. It is supposed that due to erosion, the lake extended up to Paung-pein, Yay-oo, Ho-namt, and Htat-ein.

Thein-ni, Kyauk-mè, Hsi-paw, Hèho and Kengtung which nowadays are low plain areas were formerly the old ponds. The scholars supposed that the present Nyaungshwe site has been the expanse of water of the lake in ancient time. Innlay lake is said to be 100 miles in length and many feet in depth. The extraordinary thing of the lake is its lack of hard ground surface. Green brown particles gathered together and came to constitute as alluvial soil. Among these particles

included a number of calcium and so the assumption that the Innlay lake became lime stone pond can be said rather true. (Maung Maung Chit Oo, 2012, 4)

With regard to the emergence of Innlay lake, there are different opinions. Some said that Innlay lake in the Shan state is smaller than the Indawgyi lake of Kachin state and so it was called “Inn-ga-lay” (Little pond) and it later became “Innlay”. Some supposed that it was called “Inn-lay-ywa” (Four Inn villages) and “Ywa” is dismissed in later period and it was called “Inn-lay”. Some persons said that there were four ponds, namely Nga-phe-chaung village pond, Lin-kin village pond, Yay-pyon-gyi village pond and Mya-thein-dan village pond and in reference to the four ponds, it came to be called “Innlay” (Four Ponds). Some said that the descendants of households of Tavoy ethnic people set up first the village which became “Innlay village”. (U Thein Than Tun(1996), Collections of papers on Nyaung Shwe township, *San-pya Loke-thar-mya A-pan-phyay Sa-khan*, Typing script, p. 49) It is also said by some persons that there were four villages in the Inn (Natural pond), namely Ywa-gyi-bann-bohn, Nan-pan village, Naung-taw village and Hè-yar Ywa-ma village and from these four pond villages (Inn-4 villages), arithmetic number “4” is replaced with the Myanmar alphabet “lay” and it became “Inn-lay Ywa” and in later period, the word “Ywa” is dismissed and it became “Inn-lay”.(Kanbawza Tai News)

From Innlay region, Namt-pan village, Wan-lon (Ywagyi Banbohn), Naung-taw (alias) Naung Taung Hai-ya (alias) Hèya Ywa were joined together and it was called “Innlay”. Beginning from these four villages, there also appeared other villages in their neighborhood. It is supposed that the officer whose duty was to collect tax over four villages of Innlay lake was called “Innlay Ywa Ngwe-khon-hmu” and from this event, the name “Inn 4 Ywa” is likely to be used.(Lay Myint (1984) *Thu-doh Ba-wa Thu-doh A-hla* (Their life and their beauty), Yangon, Sarpay Beikman press, p. 13)

With regard to the establishment of villages in Innlay region, it is found that except Hetha Ywama village, no evidence concerning with the remaining three villages is found. The founding of Hetha Ywama is mentioned as follows:

In *Sakaraj* 872, on 4th Waning day of Tabodwe (Wednesday), the first house was built by Shwe Wa, 56 years of age and wife Hla Nyo.(Nay Yi Yi (2004) *Inn Taing-yin-tha Yoe-ya Yin-kyay-hmu Htone-tan Ar Lae-lar-chin* (The Study of traditional culture of Inn ethnic people), Taunggyi, Archaeology and National Museum Department, p. 3)We a group of donors shall inform you. We want to set up a village as the village currently living is suffered infectious disease.

By the above-mentioned statement, it is found that the sites where the first four villages were established at Innlay are Inntein creek near Kyoon-wun-gyi Kyaung (Monastery). In Innlay region, when Sittan was collection during King Badon (Bodawpaya), U San Tin, Ngwekhonhmu of Innlay submitted Sittan on 5 May 1802.

By this Innlay *Sittan*, boundary of Innlay region can be known as follows:

- | | | |
|-----------|---|--|
| North | - | up to Shwe Myin Tin pagoda hill |
| Northeast | - | Kyauk-pon Yay-htwet |
| | - | at the vicinity of Thit-say Lay-pin Nyaung-shwe |
| Southeast | - | at the vicinity of Tha-yet-bin Maung-hna-ma (twin of mango trees) land |

- South - at the vicinity of creek which take turn at Gant-gaw old village
- Southwest - at the vicinity of Thikyit land up to Chaung-chauk-gyi Pyar-swel hill
- West - Sin-yoke Nyaungsi
- Northwest - at the vicinity of Baw (Silver of the finest quality) mine of Nyaungshwe

In Innlay region included the glebe lands dedicated to two pagodas of Shwe Inn-tein and Shwe Than-taung pagoda.

Cultural heritages

As the ancient cultural center of Myanmar, the Bagan dynasty from the reign of King Samudra (107-152 B.C) to the reign of Saw-mon-nit (A.D. 1325-1369) lasted for over 1260 with 55 dynastic rulers.(Maung Maung Chit Oo, 2012, 24-25) These kings and subject people had built a number of religious edifices and there is a saying “Hle-win-yoe-than Ta-nyan-nyan Bagan Pha-ya-paung”. In arithmetic, it is amounted to 4,446,733 stupas.

Therefore, as Bagan has been the center of ancient culture of Myanmar, so also there is a village where all ancient cultural heritages of Innlay region are gathered together and the village is called “Hè-ya Ywa-ma”. In other words, Hè-ya Ywa-ma is the village which can be described as the “Bagan of Innlay region. (U Ba Yi(1966)“Inntha Lu-myo”, Taunggyi District, *Paper on the study of the nationalities of the Union of Burma (Myanmar)*)

Hè-ya Ywa-ma is the large village which were first founded at Innlay region. It has been well-known up to the present time as the most ancient village in Innlay region. An unusual thing is that it was the village which was founded by moving two times. Hè-ya Ywa-ma village from ancient times up to the present time is the village where such ancient heritages of Buddha’s religion as *Zedi* (Stupa), temples, pagodas and monasteries, lakes and rest-houses are still located.

During the reign of King who founded first royal city at Amarapura in Konbaung period, Shwegu pagodas were built at outstanding 230 towns in different parts of Myanmar and among these pagodas included the Shwegu pagoda in Hèya Ywa-ma.

During King Thibaw’s reign of later Konbaung period in *Sakaraj* 1243 M.E., when the Buddhist missionary monks were sent to outstanding towns in different parts of Myanmar, and Nan-oo Sayadaw U Nyaneinda, Dipeyin Sayadaw and six monk followers were sent to Hè-ya Ywa-ma with a complete set of *Pitaka* written in gold, ink and soap letters. The mural painting which seems to be drawn at early Konbaung period can still be seen. The paintings which were drawn at the earliest times can also be seen at Ywa Nan *Zedi* near A-shay Pyin-thar kyaung in east Ywama.(Nyo Win Aung(2011) Taunggyi, *Innlel hnit Innlay A-hla* (Innlel and Beauty of Innlay), Taunggyi, Shwe Naingan Sarpay, pp. 134-135)

Conservation

The watershed areas of Innlay lake are 2166.8 square miles in extent. Although there are erosions of land at some places where forests covered and serious land erosions are found at the places where deforestation broke out.

Within the watershed areas, due to deforestation, as well as because of sand silk which flow into Innlay lake, flow of sand due to erosion of rain water on slope of hill, cultivation on

mountain slope, shifting cultivation, emission of garbage, growth of *Hmaw* (Moss), *Dike* (Slime) and *Bei-da* (Water hyacinth) at ground surface of the lake, increase of natural floating islands in the lake, Innlay lake is getting gradually silted up.(Maung Maung Chit Oo, 2012, 293)

With the Innlay lake getting silted up, capacity of water gradually reduced and it reaches the condition which can affect the hydro-electricity of Bilu creek. At the same time, natural scenes and fodders residing in it became gradually disappear with the Innlay lake.(Maung Maung Chit Oo, 2012, 294)

Therefore, due to the instigation of human beings, as well as the changes of weather and a variety of reasons made the Innlay lake ruined and so it is necessary to renovate the lake in time by great intensity. In order to maintain and perpetuate the Innlay lake, maintenance works were carried through the ages. In 1937, Department of forestry formed the Land Maintenance Committee and carried out the preventive works of soil erosion. Within 1947 to 1949, local residents were encouraged to carry out prevention works of land erosion. For the sufficiency of foods, establishment of nursery of forest, were implemented in cooperation with the international organizations including the Food and Agricultural Organization (FAO), the United Nations Development Program (UNDP), and Japan-based Karamosia.(Maung Maung Chit Oo, 2012, 295-296)

In the Innlay lake region, Chairman of the Committee for maintenance of natural environment, Ministry of Forestry, Minister of the Union himself gave instruction to try the development of the “Green Economy” which would not have bad affect on the environments or which would least bad affect on the environments and which would upgrade the living standard of the local residents. Maung Maung Chit Oo, 2012, 298)

The Department of Forestry designated the areas of Innlay lake as the core area, buffer area and remote area and carried out the works of perpetuity of Innlay lake and maintenance of environments in cooperation with other related departments including the local authorities, the United Nations Organization, the Non-governmental associations, and local residents.(Hla Hla Htay (2016) “Assessment on the provisioning and culture service of Inle lake”, *Taunggyi University Research Journal*, Volume 7, p. 173)

The Irrigation Department carried out the removal of unnecessary floating islands, floatsam, algae, silt earth from Innlay lake, the maintenance for good drainage and building of dam and dyke to deter and hold silt. The Department of Municipality made systematic management on rubbish, and discard items. The Department of fishery maintained the fish genesis systematically for incessant production of fish. The Health Department is carrying out in cooperation to get pure water and to promote the health standard of the people of Innlay region. (Maung Maung Chit Oo, 2012, 300)

During the President’s visit to Innlay lake on 6 August 2010, instruction was given to carry out regular five year plans for the maintenance of Innlay lake and ministerial departments concerned were also instructed to take part in cooperation in the plans as Innlay lake is the natural resoures of the state and cultural heritage which can be silted up gradually.

Again his visit to Innlay lake on 9 March 2012, the President also gave five points of instructions, of which included the fact that the renovation sector and maintenance sector must be divided and to carry out both sectors effectively for perpetuity of the Innlay lake.

(Nay Yi Yi, 2014, 71)

According to this instruction, the Department of Forestry of the Shan state studied the reason for silt up of the lake and local prohibitions were issued, and laid down the plan for prevention and maintenance of forests, water, earth, and birds within 20 miles of areas around Innlay lake. The maintenance works were carried out by the First Five Year Plan from 2000-2001 to 2004-2005 and the Second Five Year Plan from 2005-2006 to 2009-2010. With the Director General as chairman, the Committee of Implementation Plan for the maintenance and perpetuity of Innlake lake which was composed of 12 members from the related Departments was formed. On the basis of the suggestions from the Work shops held at Taunggyi of the Shan state and Department of Forestry (Headquarters) at Naypyidaw and working experiences, the Third Five Year Plan was laid down and implemented from 2010-2011 to 2014-2015 for the perpetuity of Innlay lake and maintenance of environmental conditions. (The News Light of Myanmar, 26 February 2019, issue)

The Department of Forestry of the Shan state carried out for the perpetuity and maintenance of natural environments as follows:

- (a) Maintenance of the watershed areas of Innlay lake, good drainage, and regular maintenance of the expanse of water
- (b) Prevention of land slide and erosion and silt up within the Innlay lake,
- (c) Impeding Knowledge to local residents and upgrading the capacity of the staffs and technical cooperation
- (d) Maintenance of ecology and biodiversity
- (e) Laying down the 35 projects under Five titles for the development of Socio-economy of the local residents. (Nay Yi Yi, 2014, 72)

Moreover, the Department of Forestry of the Shan state had founded eight forest reserves, seven outside-forest reserves, and two natural environment areas, totaling 550.05 sq.mls as settled forest areas within the watershed areas of the Innlay lake. It also listed 547.42 sq.mls of forest areas, 475.06 sq.mls of outside-forest reserves, 475.06 sq.mls of cultivated areas and 524.92 sq.mls of other land areas, totaling 2166.8 sq.mls. In this way, attempts are made for the perpetuity of the Innlay lake by the maintenance and prevention of forests and reforestations. (Nay Yi Yi, 2014, 75)

In cooperation with the scholars from different sectors, departmental and non-governmental organizations, and Innlay based entrepreneurs, maintenance of Innlay lake is carried out in unity by the local residents of Innlay region on the basis of individual responsibility ranging from the whole family, the whole village, the whole town, and up to the whole country. (Nay Yi Yi, 2014, 73)

The notice letters of the Department of Forestry give great contribution to the environmental conservation. It is known from the estimation of scholars that the Innlay lake can be dried up within 550 years (Dr. V. N. Nijampurkar, (1993) *Report on the Sedimentation rates of Inle*, Myanmar) and it might be earlier that date. Due to weather changes, Innlay lake was getting dried up in the year 2010. Forests and plants in the vicinity of the Innlay lake prevented the lake from soil erosions and flow of silt into the lake, as well as it contributed to the fair weather of the lake. (Maung Maung Chit Oo, 2012, 241)

If deforestations occurred, the world will also be depleted. So the forests shall be maintained so that the world not to be depleted and the world will be lasted for longer.

For the Innlay lake to be pleasant and attractive, instructions are given for cleansing of hyacinths and educating the people not to make floating islands any more. (Tint Moe Thuzar, 2007, 142)

In 1993, Ministry of Forestry of the Union of Myanmar, in cooperation with the UNDP and FAO, made detail research and it is found that sediment was agitated up to 3.5 centimetres. Therefore, plans were laid down for the maintenance of the Innlay lake.(Maung Maung Chit Oo, 2012, 241) In comparison with 10 millions year ago when the Innlay lake first appeared, attitude of water expanse of the lake lowered about 300 feet nowadays. It is said that the present site of Nyaungshwe has been under water in ancient time.

The Innlay lake is the ASEAN Environmental Conservation Area and the second largest fresh water lake of Myanmar.(Nay Yi Yi, 2014, 4)In the year 2010,there broke out extraordinary heat in the Innlay lake and deterioration of environments within the lake made the lake dried up and so ten points for the maintenance of the lake are laid down by the state as follows:

1. Villages, houses, floating islands shall not be allowed to expand further within the lake
2. Unnecessary floating islands, floatsam, algae, and silt earth from Innlay lake shall be salvaged and removed
3. Maintenance for the good drainage of the creeks
4. Prohibition of forests and tree cutting and reclamation of cultivated lands within 20 miles around the Innlay lake
5. Prohibition of making floating islands with fence.
6. Cultivation of ever green forests and trees in watershed areas for fair weather and high rainfall
7. Build up of silt-deterred dams for the prevention of silt slide
8. Build up of water resources for drinking water
9. Environmental conservation and educating the local residents about the Innlay lake as national requirement.
10. A Foundation of Finance shall be set up for the conservation of the Innlay lake with the state investment and contributions of entrepreneurs.(*Kyemon Newspaper*, 27 June 2011 issue)

If Innlay lake is unable to be maintained and if is ruined, local residents who depend on the lake for their livelihood, and Hotels and tourism which based on natural resources of the region will be affected. As water necessary for the Lawpita hydroelectrical power plant will not be provided and it will affect the electrical sector. If yayhma which consume a great quantity of oxygen became so widespread, living of fish will be difficult. Formerly, there were over 40 species of fish in the lake and nowadays, four species of fish will be extinct. If the Innlay lake is unable to be maintained, fish species will gradually be disappeared. (Maung Maung Chit Oo, 2012, 267-268)

Results and Finding

Innlay lake is a cultural heritage and it is the second largest natural fresh water lake in Myanmar.

Hè ya Ywama village from ancient times up to the present time is the village where such ancient heritages of Buddha's religion as Zedi, temples, pagodas and monasteries lakes and rest houses are still located.

The Innlay lake is the ASEAN Environmental Conservation Area of Myanmar.

In the year 2010, there broke out extraordinary heat in the Innlay lake and deterioration of environments within the lake made the lake dried up and so ten points for the maintenance of the lake.

If Innlay lake is unable to be maintained and if is ruined, local residents who depend on the lake for their livelihood, hotels and tourism which based on natural resources of the region will be affected.

- As water necessary for the lawpita hydroelectrical power plant will not be provided and it will affect the electrical sector.
- If the Innlay lake is unable to be maintained, fish species will gradually be disappeared.
- In order not to disappear the beauty of the Innlay lake, the government, in cooperation with the United Nations Development Program had carried out the progress of Innlay region and maintenance of the lake by implementing six sectors.

Conclusion

Taking as a whole, the Innlay lake which is located at Nyaungshwe valley in Nyaungshwe township of the southern Shan state is the lake which has been existed since 10 millions ago. Next to Inndawgyi lake, Innlay is the second largest lake in Myanmar. Moreover, the Innlay lake is the place of honor as it is designated as the ASEAN Heritage Park. The Innlay lake is the water source of Lawpita Hydroelectrical power plant and so it is an important place. Inn-thas who are residing in the Innlay lake build their houses on the expanse of water, earn their living by growing plants and fishing and their way of living attracted the tourists which is providing the development of tourism in Myanmar. “The Mirror of the Maw Shans” and “Little sea on mountain” are the phrase used as metaphor to describe the beauty of the Innlay lake. Being the area extraordinary with green trees and plants, Innlay lake is the natural heritage of the Union of Myanmar. In order not to disappear the beauty of the Innlay lake, the government, in cooperation with the United Nations Development Program (UNDP), had carried out the progress of Innlay region and maintenance of the lake by implementing six sectors, namely health, education, renovation of watershed areas, availability of pure water, environmental sanitation, small loan project and social development plan. The local residents of the Innlay region joined together with the scholars from different sectors, departmental organizations, and non-governmental organizations for the perpetuity of the Innlay lake and carried out the maintenance of the Innlay lake so that its natural beauty and its value not to be reduced.

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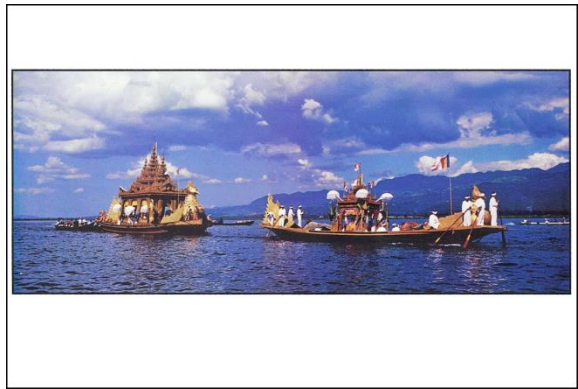
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The Beauty of Innlay



The Maintaneous Work of Innlay



