Effect of Channel Changes on Livelihood of People in the Western Lower part of Sittaung River

Khin Khin Htay[1], Khin Mi Mi Win[2], Khin Khin Han[3]

Abstract

The study observed the effects of channel changes on livelihood of people status of the Western Lower Part of Sittaung River during the period from March 1990 to March 2019. The study area lies on the western part of Sittaung River in south part of Myanmar. Study area includes the Kawa Township and Thanatpin Township. These villages suffer from both channel changes effect and bank erosion effects often or frequently. Some villages are loss of life as settlement, livelihood and changes their economic conditions. The main objective of the project is the study of local livelihood and sustainable economic conditions of local communities that effected river bank erosions. In this paper, study on the change of channel of the western lower part of Sittaung River using the satellite images from 1990 to 2019 conditions and examine the change of bank effect villages of economic condition and changes of their livelihoods. Methods used are the river channel changes analysis and assessment of economic and livelihoods are used by questionnaires surveys in 2018. According to the result, local communities are negatively being experienced such as loss of line and property, loss of livelihoods, decreased purchasing and production power, mass migration, psychological effects, driving economic conditions and consideration of sustainable economic conditions.

Keywords: livelihoods, channel change, sustainable

Introduction

Natural hazards, which damage national economy and produce hardships for large sections of population, are one of the single largest concerns for most nations. Human settlements have frequently affected by natural hazards such as floods, earthquakes, hurricanes, cyclones, landslides, volcanic eruptions and channel bank changes, which take a heavy toll on human lives, destroy buildings and infrastructure and have for reaching economic and social consequences for communities. Western lower part of the Sittaung River area is experienced by the climate change effected areas. In this paper study area is located in the west part of Sittaung River area. The Sittaung River rises from the edge of the Shan Plateau and flows south for 260 miles (420 km) to empty into the Gulf of Martaban of the Andaman Sea. The broad Sittaung River valley lies between the forested Bago Mountains on the west and the steep Shan Plateau on the east and holds the main road and railway from Yangon to Mandalay as well as the major towns of Bago, Taungoo, Yamethin, and Pyinmana. The river is navigable for 25 miles (40 km) year-round and for 55 miles (90 km) during three months of the year. The Sittaung is used to float timber, particularly teak, south for export. Its lower course is linked by canal to Bago River. This canal, built to bypass the tidal bore that afflicted the mouth of the Sittaung, once provided the only route from Yangon to Taungoo. The Paunglaung River is a tributary of the Sittaung. Sittaung River channel is mostly changes in the last two decade. In this paper, study on the effect the channel changes on the local livelihoods. Human lives destroy buildings and infrastructure and have for reaching economic of local people and social consequences for communities.

Aim

The aim of research work is effect of channel changes on livelihood of people in the western lower part of Sittaung River.

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Objectives

The objective of research is the study of the changes of channel pattern in the Sittaung River and to examine the the change of channel patterns effects on the local people livelihoods changes.

Study Area

Study area locates in the Kawa Township in Bago Region in Myanma. Study area is lie between 16‰52'37" and 17‰21'12" latitude and between 96‰47'4" and 96‰ 58'31" longitude. The Sittaung river basin is located in central-south Myanmar and contains the Sittaung River. Rising northeast of Yamethin on the edge of the Shan Plateau and flowing south with a catchment area of 48100 km^2 for 420 km. Study area is the southern portion of the Sittaung River. It contains the settlement area with 13 settlement area.

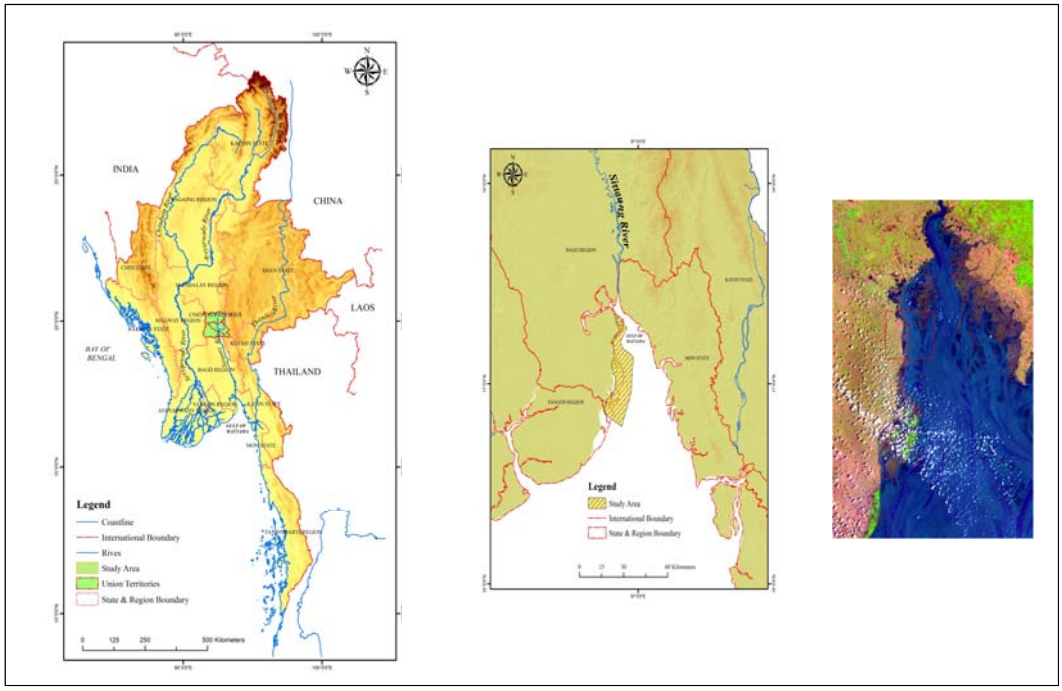

Figure (1). Location of Study Area. Source: Topographic Map (1:50000) and (1:63360)

Data and Methodology

Sittaung River channel changes pattern data from the satellite Landsat Images of Landsat 7 ETM and Landsat 8 from 1990 to 2019 images. Effect of channel changes of settlement area from the field surveys and changes of people livelihood data derived from the questionnaires surveys (2018 and 2019).

Channel Changes of the West Lower part of the Sittaung River

The Sittaung River rises from the edge of the Shan Plateau and flows south to empty into the Gulf of Martaban of the Andaman Sea. In this paper, study on most chaneel pattern of the west lower part of the Sittaung River area. It comprises the Kawa and Thanatpin Township. Chennel change pattern are most found in Kawa Township. Channel change pattern evaluate from the landsat satellite images 1990 to 2019.

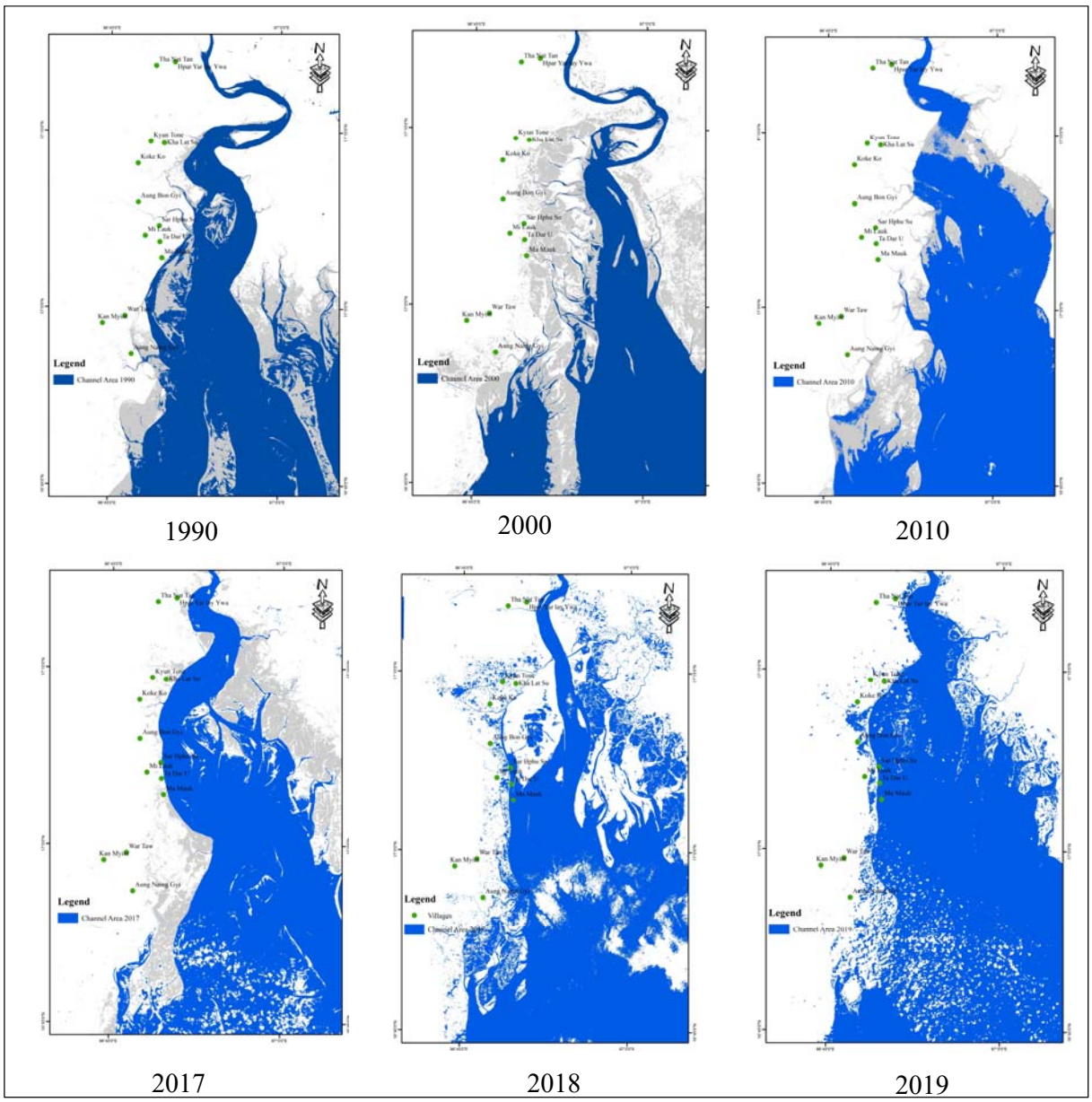

Figure (2). Channel Change Pattern of 1990, 2000, 2010, 2017, 2018 and 2019. Source: Landsat 5, Landsat 7 ETM and Landsat 8Path 132, Row 48, March

In this area are include 13 villages, there are Ma Mauk, Sar Phyu Su, Tada U, Mi Lauk, Kha Lat Su, Kyun Tone, Aung Bon Gyi, Koe Ko, War Taw, Kan Myint, Aung Nain Gyi , Hpar Lay, That Nat Tan. In all villages, Ma Mauk, Sar Phyu Su, Tada U villages are disappear the settlement area affected by the channel changes of Western Lower part of Sittaung River area.

Result and Discussion

According to the changes of satellite images of 1990 to 2019, lower western part of the Sittaung River area is affected the three villages. These are Sarphyusu, Tada U and Mamauk village. Therefore, in this paper, measurements of channel change are based on the three villages. In 1990 to 2000, Sittaung River Channel is shifted eastern ward 6.29 km near

Sar Phyu Su, 0.03 km near Ma Mauk and 8.56 km near Tada U village. In 2000 to 2010, river channel is shift to westward 2.31 km near Sar Phyu Su, 3.367 km near Ma Mauk and 2.09 km near Tada U village respectively. In 2001 to 2017, river channel was moved toward the west part of 9.23 km in Sar Phyu Su, 7.32 km in Ma Mauk and 9.6 km in Tada U village area. In 2017 to 2018, river channel is changed from west part of 0.56 at Sar Phyu Su, 1.79 km, 1.79 km at Ma Mauk and 0.97 km at Tada U village. During the 2017 and 2018, Sar phyu Su, Ma Mauk and tada U villages were collapses by channel change of bank erosion.

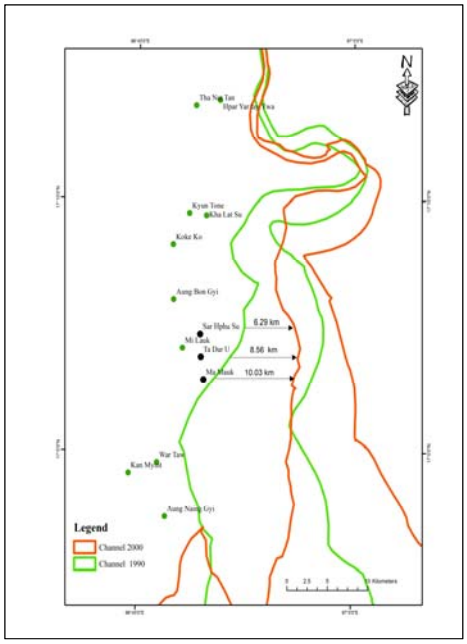

Figure (3). Channel Change of 1990-2000
Source : Landsat 5 and Landsat 7 ETM
Path 132, Row 48, March

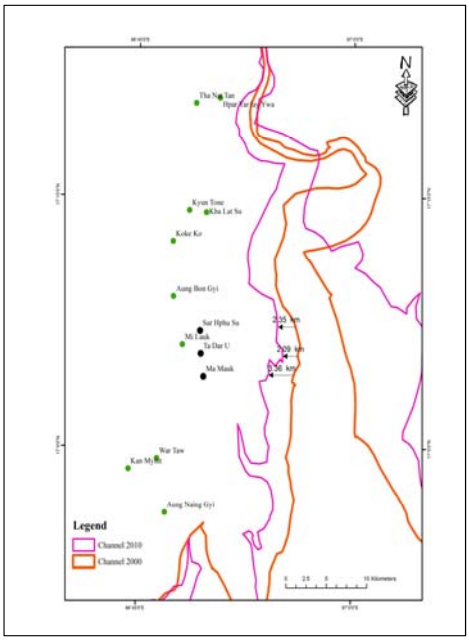

Figure (4). Channel Change of 2000-2010
Source : Landsat 5 and Landsat 7 ETM
Path 132, Row 48, March

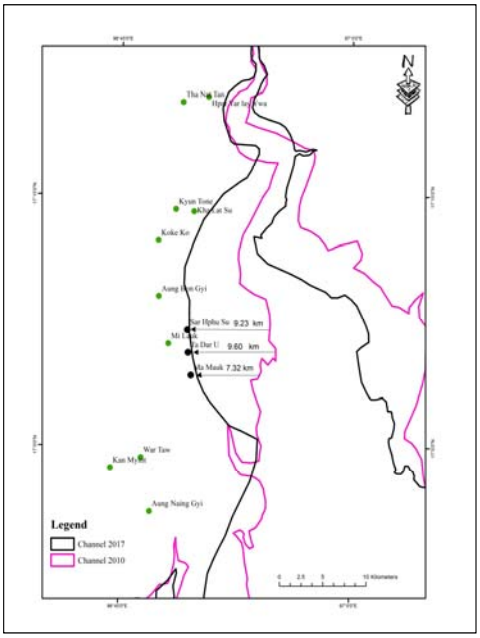

Figure (5). Channel Change of 2010-2017
Source : Landsat 7 and Landsat 8, Path 132,
Row 48, March

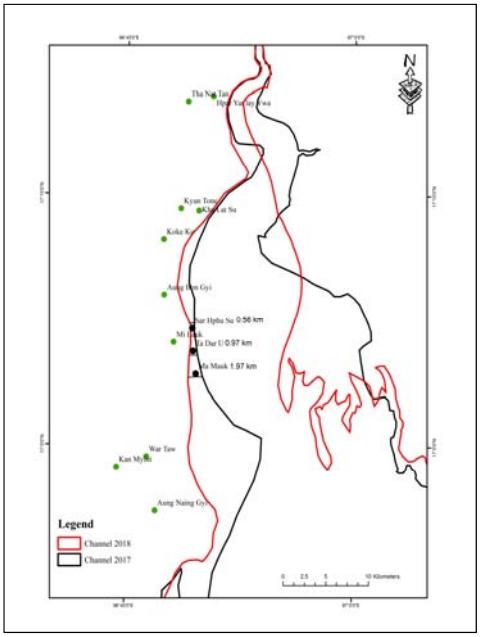

Figure (6). Channel Change of 2017-2018
Source : Landsat 7 and Landsat 8, Path 132,
Row 48, March

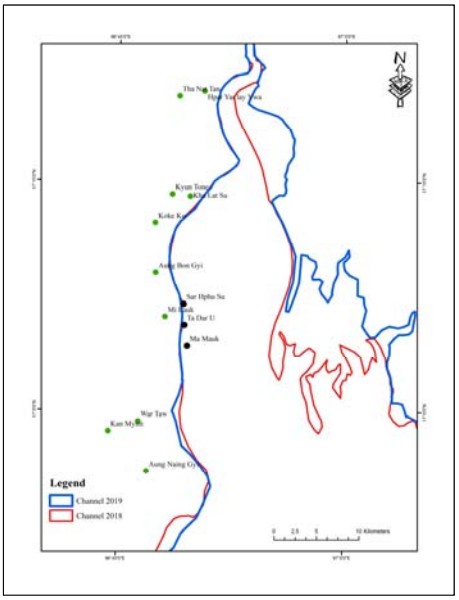

Figure (7). Channel Change of 2018-2019
Source: Landsat 7 and Landsat 8, Path 132, 8 Row 48, March

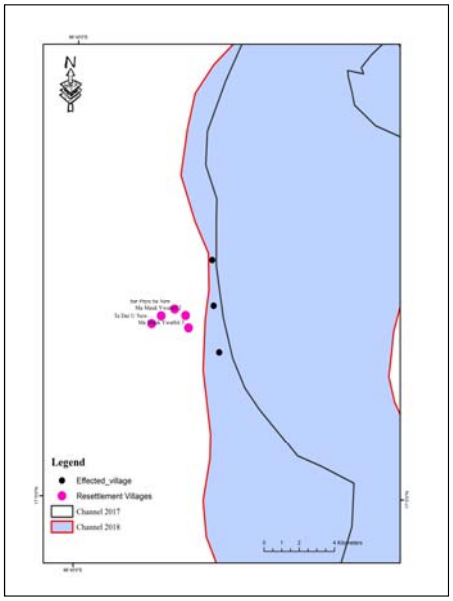

Figure (8). Channel Pattern 2019
Source: Landsat 8, March Path 132, Row 4, March

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After 2017, these villages were moved to resettlement area of near the western bank area. These three villages were entirely moved to the new settlement area in 2018. These three villages are Sar Phyu Su, Ma Mauk and Tada U villages. In 2018 questionnaires survey, Sar Phyu Su village have 65 households and was survey as 20 household, Ma Mauk village have 225 households and was survey 65 households, Tada u village have 71 househols and was survey 30 households.

In the previous time, Ma Mauk was a large village of Kawa Township. Former Ma Mauk villages were built round about 100 years. The formation of old Mamauk village was systematically managed by the administrators that concerned with administrative office, police stations, high schools, Healthcare unit, religious buildings, cottage industry such as rice mill and oil mill. This village was lied nearly the sittaung river bank within Kawa Township. Especially, this village was mostly suffered from the Sittaung river landslide and erosion in 2107. In 2108, Ma Mauk village was entirely faced and collapsed of river bank erosion effects. After the effects of Sittaung river bank erosion, Ma Mauk village was divided into the three villages. These villages are Ma Mauk Ywathit (1), Ma Mauk Ywathit (2) and Ma Mauk Ywathit (3).

In Ma Mauk Ywathit (1) village, villagers were worked the fisherman and farmers. After 2017, they were moved of settlement area and changed their jobs. According to the questionnaires survey, villagers were worked of farmer 27.5%, fisherman 15 %, Daily wages 32.5% and others works as 25 %. After the channel change, villagers are changed of their livelihoods as daily wages as boat driver, motorbike driver. In survey of household economic conditions are classified the very good, good, fair and weak conditions, In Ma Mauk (1) village, very good conditions is the 17.5 % and good conditions as 25 %, fair and weak as 37.5% and 17.5 %, none as 2.5 % of before channel change. After the bank erosion, very good conditions is the 5 % and good conditions is none, fair and weak as 38% and 55 %, none as 3 % Figure (9).

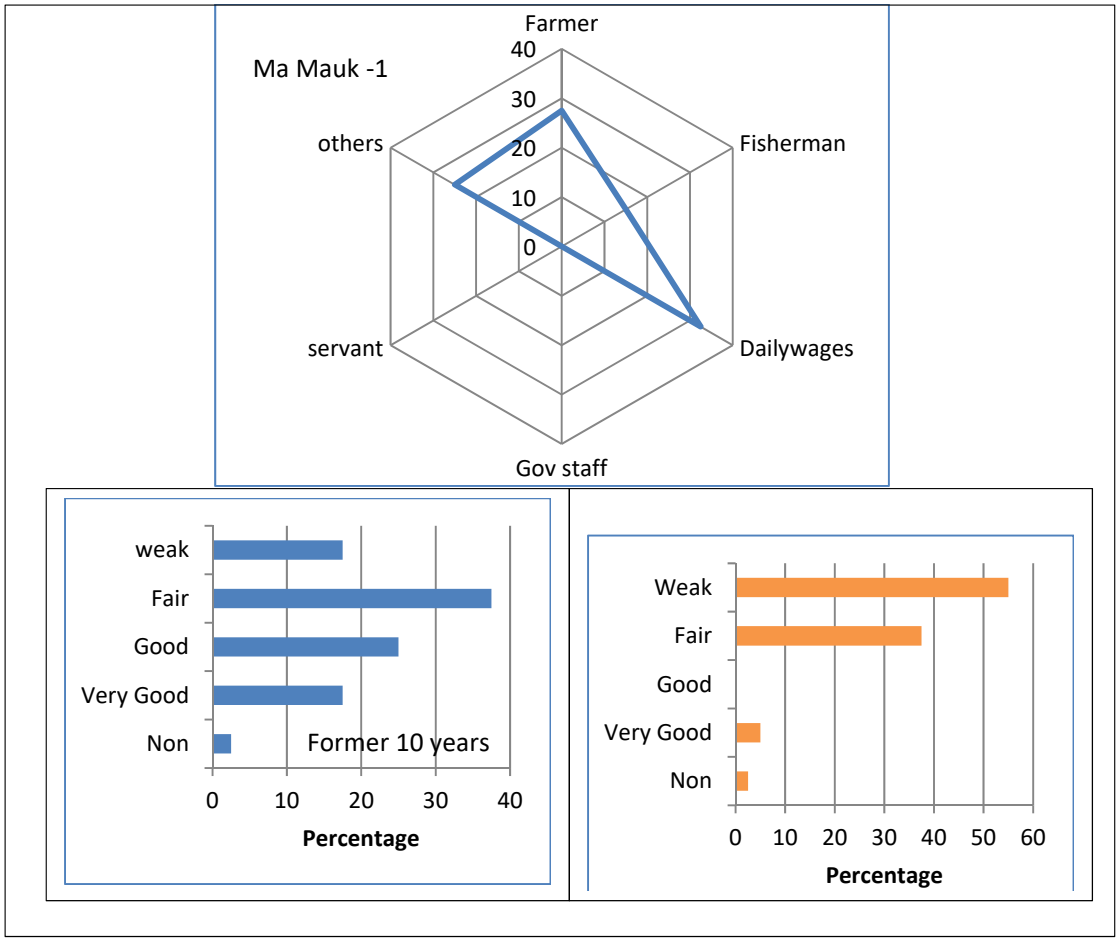

Figure (9). Changes Livelihood Pattern of Survey Households in Ma Mauk Ywathit (1) Village.
Source: Questionnaires Survey, 2018

In Ma Mauk Ywathit (2) village, villagers were worked the fisherman and farmers. After 2017, they were moved of settlement area and changed their jobs. According to the questionnaires survey, villagers were worked of farmer 6.7 %, fisherman 46.7 %, Daily wages 20 % and others works as 26.7 %. After the channel change, villagers are changed of their livelihoods still the fisherman and daily wages of motorbike driver. In survey of household economic conditions are classified the very good, good, fair and weak conditions, In Ma Mauk (2) village, very good conditions is none and good conditions as 13 %, fair and weak as 67% and 13 %, none as 7 % of before channel change. After the bank erosion, very good conditions is the 7 % and good conditions is the 13 % , fair and weak as 27 % and 53 % Figure (10).

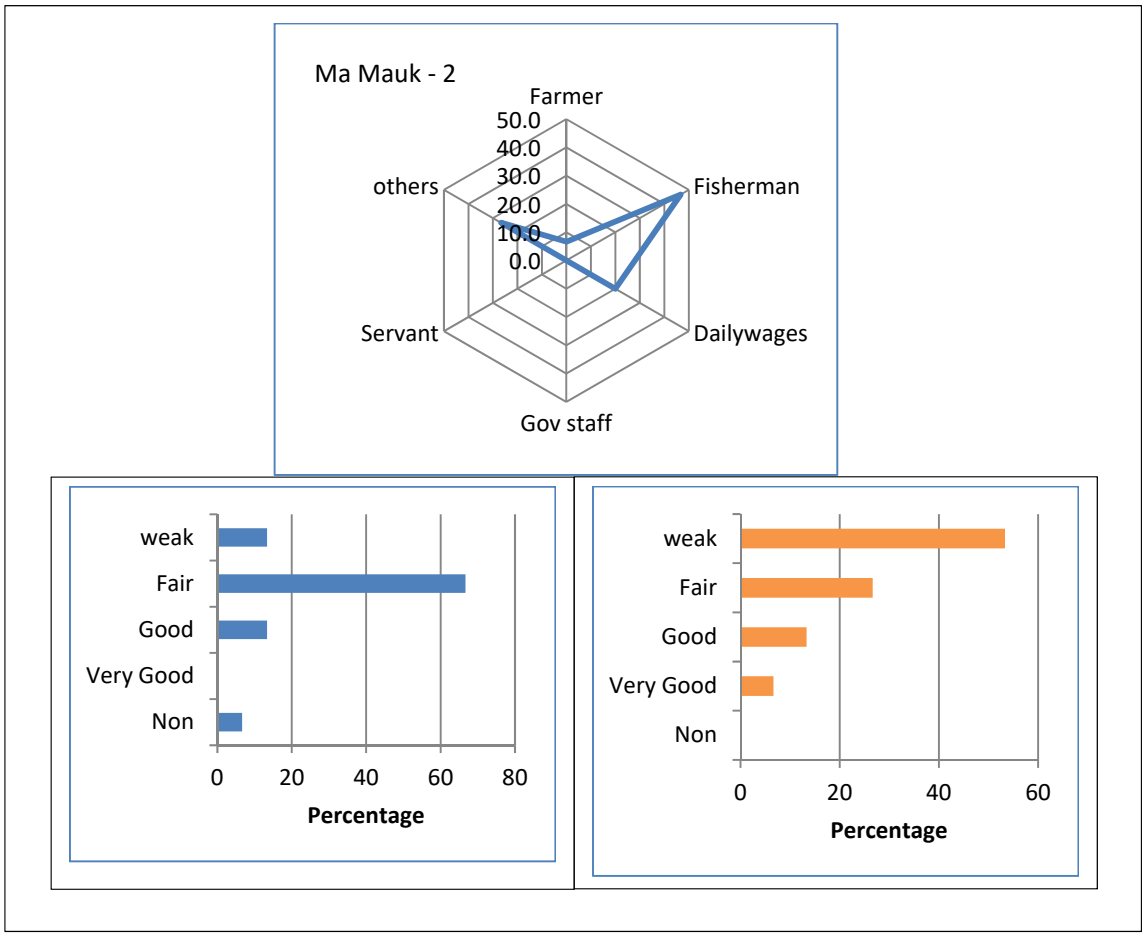

Figure (10). Changes livelihood Pattern of Survey Households in Ma Mauk Ywathit (2) Village.Source: Questionnaires Survey, 2018

In Ma Mauk Ywathit (3) village, villagers were worked the fisherman and farmers. After 2017, they were moved of settlement area and changed their jobs. According to the questionnaires survey, villagers were worked of farmer 50 %, fisherman 30 %, Daily wages 20 %. After the channel change, villagers are changed of their livelihoods still the farmer because of their le area is low collapse. In survey of household economic conditions are classified the very good, good, fair and weak conditions, In Ma Mauk (3) village, very good conditions is none and good conditions as 80 %, fair and weak as 20 % and none of before channel change. After the bank erosion, very good conditions is none and good conditions is none, fair and weak as 80 % and 20 % Figure (11).

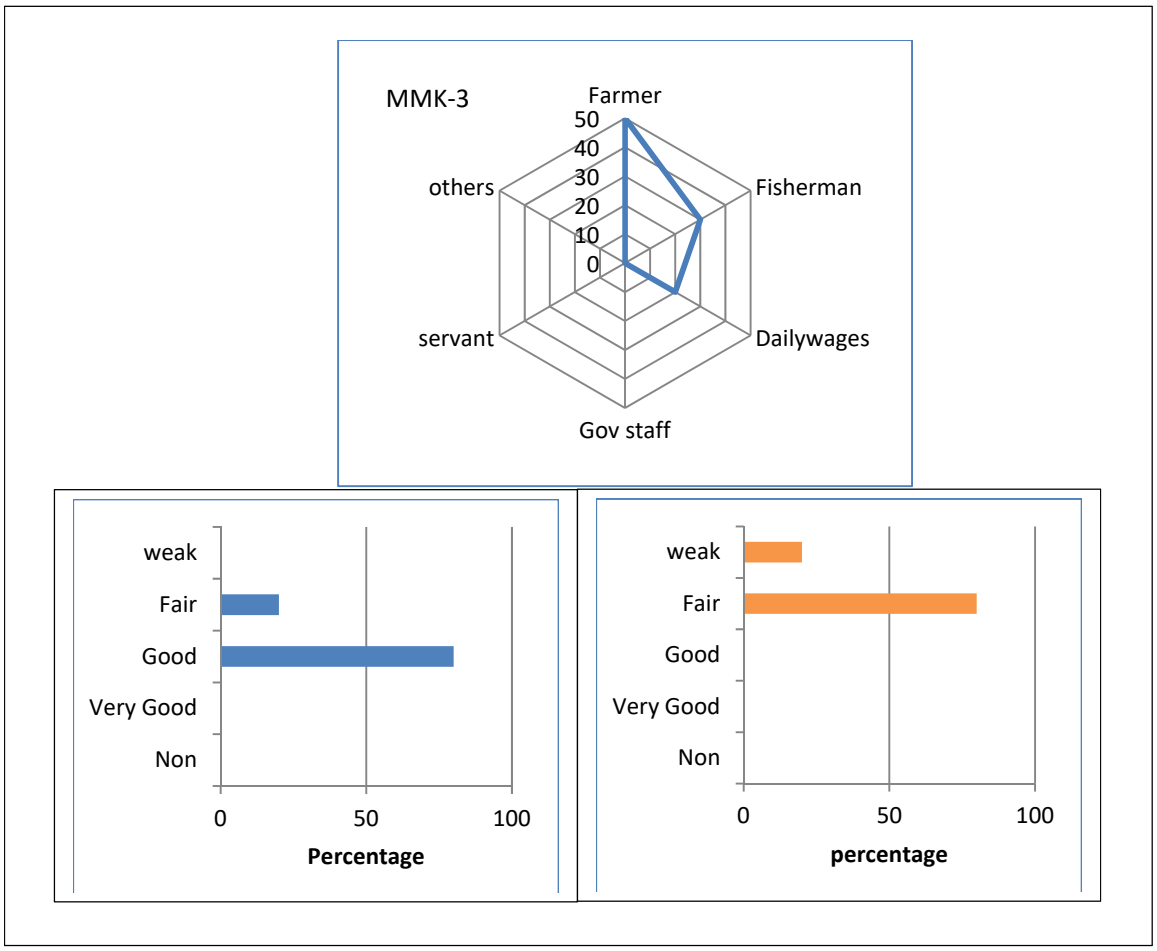

Figure (11). Changes livelihood Pattern of Survey Households in Ma Mauk Ywathit (3) Village.
Source: Questionnaires Survey, 2018

In Sar Phyu Su Ywathit (3) village, villagers were worked the fisherman, farmers and government staff. After 2017, they were moved of settlement area and changed their jobs. According to the questionnaires survey, villagers were worked of farmer 35 %, fisherman 20 %, Daily wages 40 % and government staff 5 %. After the channel change, villagers are changed of their livelihoods change he dailywages because of their le area is low collapse. In survey of household economic conditions are classified the very good, good, fair and weak conditions, In Ma Mauk (3) village, very good conditions is 10 % and good conditions as 5 %, fair and weak as 15 % and 30 % of before channel change. After the bank erosion, very good conditions is 15 % and good conditions is 10 %, fair and weak as 20 % and 45 % Figure (12).

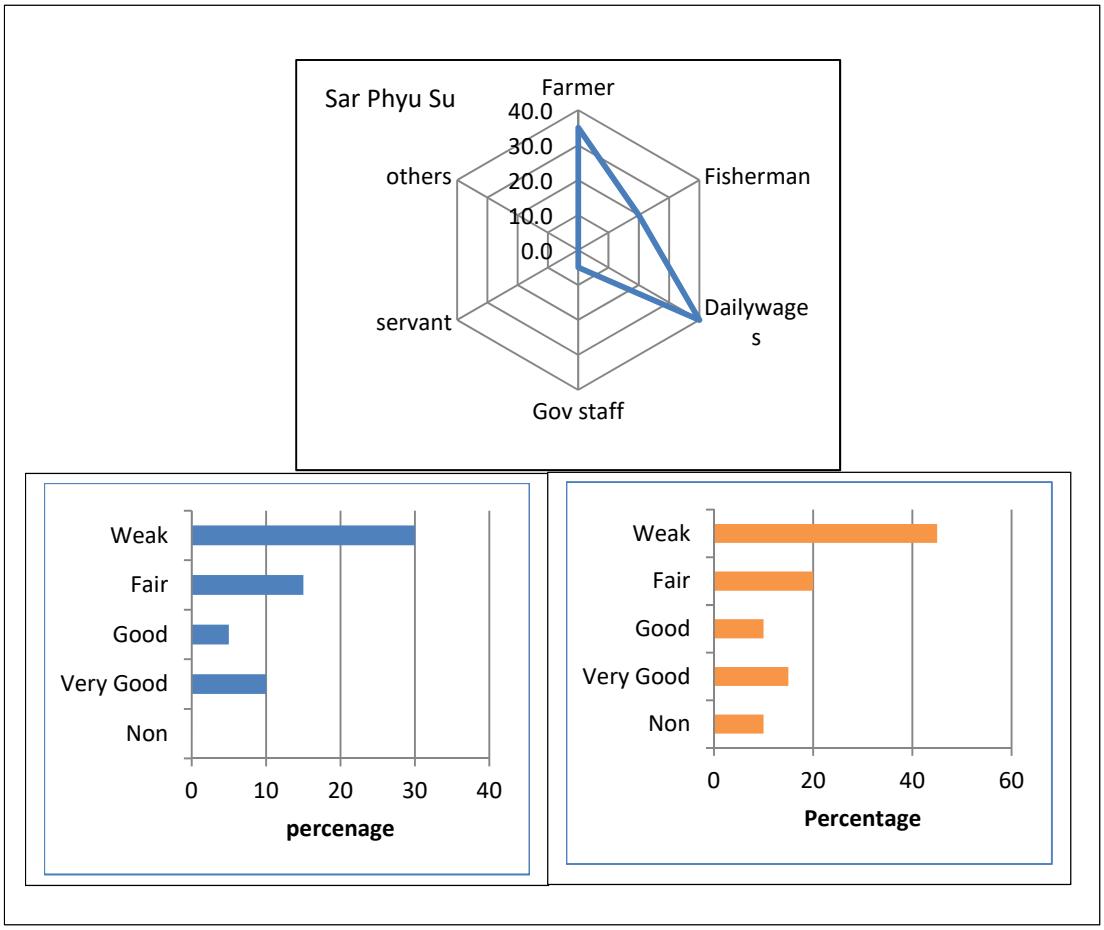

Figure (12). Changes livelihood Pattern of Survey Households in Sar Phyu Su Ywathit Village. Source : Questionnaires Survey, 2018

In Tada U Ywathit (3) village, villagers were worked the fisherman, farmers and government staff. After 2017, they were moved of settlement area and changed their jobs. According to the questionnaires survey, villagers were worked of farmer 37 %, fisherman 13 %, Daily wages 23 % and government staff 3 %, others 23%. After the channel change, villagers are changed of their livelihoods still the fisherman and daily wages of motorbike driver.. In survey of household economic conditions are classified the very good, good, fair and weak conditions, In Ma Mauk (3) village, very good conditions is 25 % and good conditions as 17 %, fair and weak as 27 % and 27 %, none as 5 % of before channel change. After the bank erosion, very good conditions is 10 % and good conditions is 7 %, fair and weak as 20 % and 63 % Figure (13).

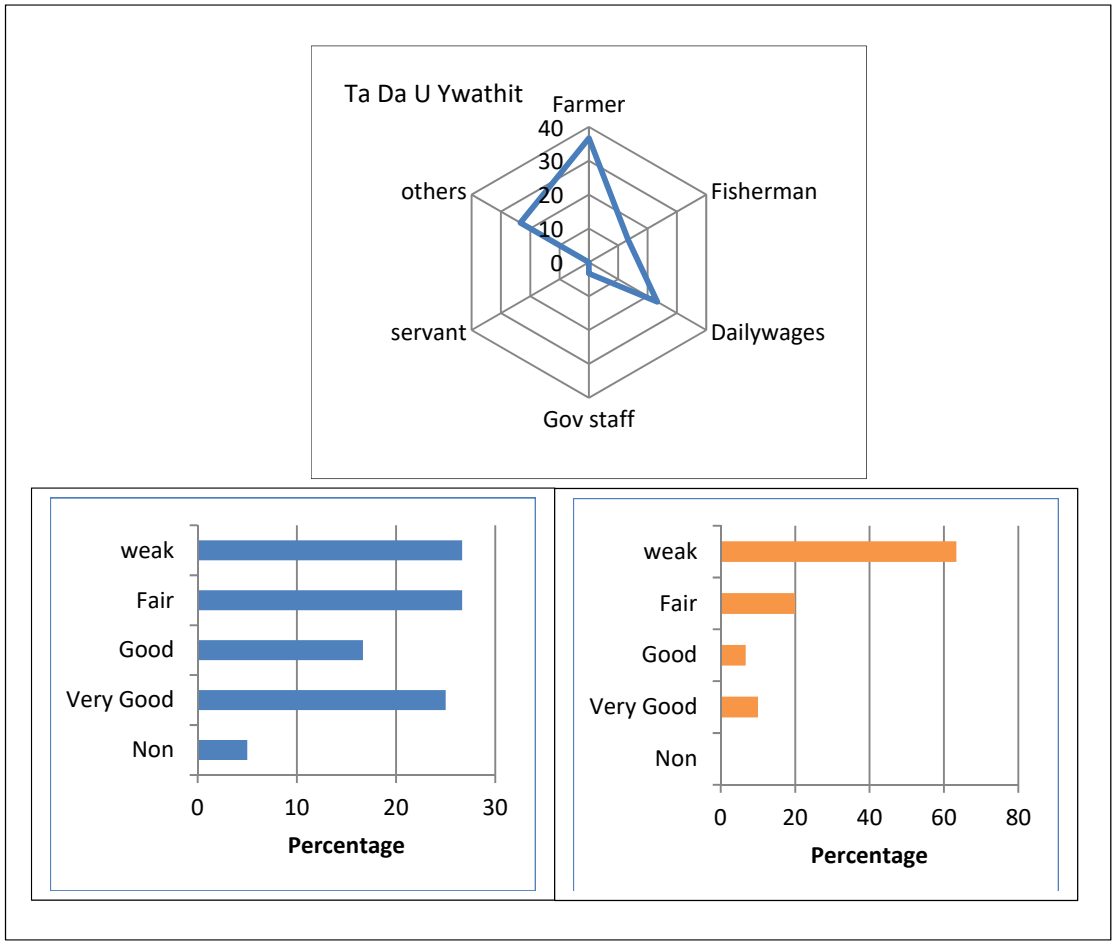

Figure (13). Changes livelihood Pattern of Survey Households in Tada U Ywathit Village
Source: Questionnaires Survey, 2018.

Conclusion

Sittaung has a notorious tidal bore at its mouth which has precluded any but very small craft navigating the river. The river is used primarily to float timber south for export. Strong currents make the river even less valuable as a means of transport in eastern Burma. Its basin does not have the same richness for agriculture as the Irrawaddy because there is no soil flowing down from the Shan Hills. But southern part of Sittaung river area is alleviated land area as sedimentation area. It area was cultivated the paddy land area with the human settlement. This area is a good location and fairly climatic conditions. It has many fertile soil and flood plain area. Formerly, Agriculture is a mainly sectors and most people depend on farming and fishing. The three villages suffer from brain drains that reduce the negative impacts. Because of challenges, people come to face many problems. In the future, the three villages can join to cooperate together with and with the governmental policy, technicians, technology, NgOs, investment, the natives, volunteers from various social society factors, this area will also develop for sustainable community livelihoods in future.

Acknowledgement

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