

The impact of flooding on socio-economic condition of vulnerable populations in Mandalay Region

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Abstract

The study aimed to examine the impact of flooding on socio-economic status of people in Taungthaman village and Kyauk Thawe Tauk village which are situated in the Mandalay Region of Myanmar. Questionnaires related to socio-economic status such as job, education, health, housing, water and sanitation were used to collect data and secondary data was also collected from general administrative office of the village. A total of 113 people participated in a survey, and the results showed that 95% felt stress during flooding because they could not work properly, getting food was inconvenient and access to drinking water was inadequate. Besides these, the schools were closed, and the children could not go to school. It was also found that their sanitary facilities were affected by flood. Local residents also relocated to the nearby Pagoda and on the side of the street during flood for shelter and accessed to food and water. The study suggests that government and other stakeholders should provide affordable housing, health care services, food and drinking water to victims to mitigate the problems during flooding. They should also promote the development of Smart Cities and allocate adequate fund to disaster management bodies for proper planning of the areas.

Keywords: Climate change, Flooding impacts, Myanmar, Socio-economic status

1. Introduction

It is widely accepted that humans are exacerbating the harmful impacts of climate change and in turn, climate related disaster such as increased rainfall and flooding are on the rise. Flooding is a natural disaster that could cause not only physical injuries and direct loss of social and economic condition but also psychological injuries

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including anxiety and fear within families and individuals (R.G.Awopetu, S.O., & M.S.Awopetu, 2013). People face great challenges associated in flooding all over the world (Kwari, Paul, & Sheka, 2015). In Myanmar many floods occur due to heavy rainfall from the southwest monsoons during the months of July to October where the topography of the country is characterized by the central plain (delta), surrounded by steep mountains on the west side and highlands on the east side. Rainfall in the mountains and highlands causes flood damage in the central plain and coastal areas and can last for weeks even months.

Taungthaman village, which is situated in Taungthaman village tract, Amarapura Township in Mandalay Region, is one such community that suffers from increased flooding every four years due to its location between the Ayeyarwady and Myintnge River. In 2004 the water level rose to 1,382 cm, and in 2016 the water level rose to 1325 cm lasting for two weeks affecting 693 people. Kyauk Thawe Tauk village, located in Shwe Kyat Yat village tract of the Mandalay region, is surrounded by Kan Kaw village on the north side, Moe Kaung village on the south side and the Ayeyarwaddy River in the west. There are 307 households in this village where most are Buddhist and people in this village earn income by weaving cloth. Flooding occurs every year and can last for two months. In Kyauk Thawe Tauk village, people who live in lower land areas suffer flood more often than people who live in higher land areas. The houses in low land areas were often completely submerged underwater for days (Images 1 and 2).



Image 1. Submerged homes in Taungthaman village during flooding in August 2019 (Source: Photo taken during survey)



Image 2. Submerged homes in Kyauk Thawe Tauk village during flooding in August 2019 flooding in (Source: Photo taken during survey)

Socio-economic impacts refers to all changes in the way people live, work, relate, organize and how these interactions have direct influence on means of livelihood, purchasing and production power, mass migration and agriculture (R.G.Awopetu, S.O., & M.S.Awopetu, 2013). Social impact is difficult to quantify in monetary terms and economic impacts include disruptions of clean water and electricity supply, transport, communication, education, health care services, reduction in purchasing power and loss of land value in the flood plains which can lead to increased vulnerabilities of communities living in the area. The additional cost of rehabilitation, relocation of flood victims and removal of property from flood-affected areas can divert the capital required for maintaining production.

The purpose of this pilot study was to understand the impact of flooding on socio-economic condition of the people in the two villages and areas in which improvements can be made to prevent harmful impacts of flooding.

2. Methods

Taungtaman and Kyauk Thawe Tauk village (Images 3 and 4) were chosen for the study site because people in these areas suffer from flooding every year presenting an opportunity to learn and understand how this frequent natural disaster impacts their lives.

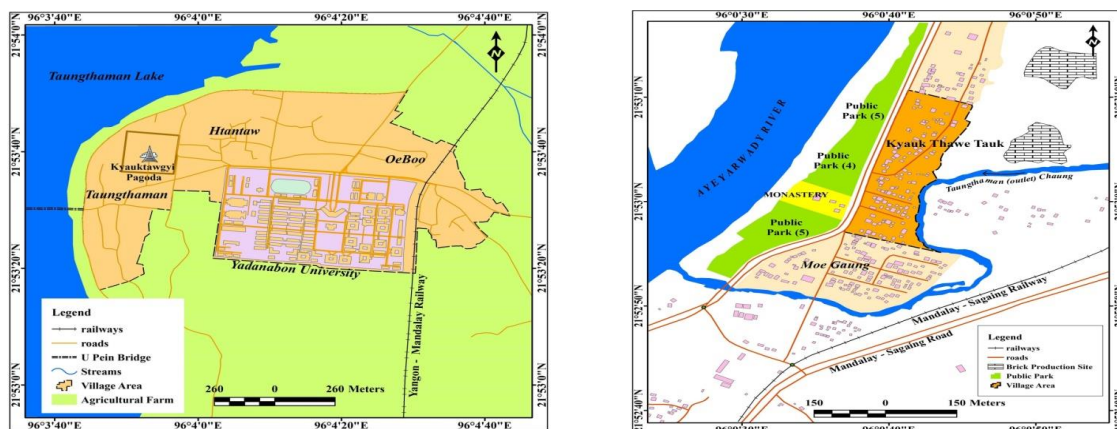


Image 3 & 4. Map of study areas

Surveys related to socio-economic status such as household demographics and the impact of flooding on working conditions, education, health, water and sanitation were used to collect data and secondary data was also collected from general administrative offices of the two villages. Data was collected in August 2019 through individual interviews with 113 conveniently sampled households within Taungtaman village and Kyauk Thawo Tauk village. Simple percentages and frequencies were used in statistical analysis. This study was approved by Myanmar Ministry of Education and Northern Illinois University Institutional Review Board.

3. Results and Discussion

The ages of respondents ranged from 18 to 71 with an average of 42. Regarding their marital status, 85.8% of respondents were married and 69.9% of respondents being women. Monthly household incomes ranged from 100,000 to 500,000 kyats with a median of 180,000 kyats (or 117 USD). The people most affected by flooding were those in the low-income group of which women worked in cloth weaving for their income.

Over a half (59.3%) of respondents could not stay in their homes during flooding and must relocate to the sides of streets or nearby monasteries for shelter for sometimes up to three months. Vehicles go along the street all day and night causing noise and air pollution impacting those who relocate to streets. It should be noted that it costs more than one lakh (100,000 kyats or 65 USD) to build a shelter on the side of the road causing those who cannot work difficulty in not only physical and mental distress but also financial distress.

During flood 79% of respondents could not work and did not earn decent income for food and 77% had food difficulties (Table 1). Respondents borrowed money from others in order to buy food and return the borrowed money after flooding when they can work properly. During flooding 56% of respondents answered that they did not send their children to school because of closures due to flooding (Table 1). 52.2% of respondent's education background is primary education. 77% of respondents did not access health services during flood but 23% of the respondents had access to health services but not sufficient. Related to flood impact on health, most respondents answered that they were not suffering from the diseases such as diarrhea, cough, malaria and measles during flood but they had got flu at the time of post flood because they had to commute in the water to buy food which are sold in high land which are not affected by flood and to go to somewhere in the village. Some respondents possessed boat and they used the boat for transportation. Although the water level went down, they could back and stay in their house immediately because the house was in need of cleaning and the sanitary facilities, which were affected by flood, were also in need of rehabilitation.

Eighty-nine and 86% of respondents had access internet and electricity respectively. Although the respondents have access to electricity, they reported that they felt unsafe and had fears of electricity shock. Most of them (95%) shared that they felt stress during flooding. Ninety two percent of respondents reported that the borehole was their most common source of drinking water and 8% reported that unprotected well was their most common source of drinking water. Seventy eight percent of respondents reported that their sources of drinking water are

affected by flooding and rely on donated water. Sanitation is also another challenge because the supported hanging latrines are not sufficient for all flood victims although the authorities arrange it for them. Seventy two percent of their sanitation facilities were affected by flood (Table 1) and hanging latrines were not always available each year during flooding.

Table 1. Impacts on housing, education, socio-economic status, water, sanitation and electricity from flooding

Impacts	Frequency	Percentage
Stay at home during flood		
Yes	46	40.7
No	67	59.3
Difficulty finding and buying food		
Yes	87	77
No	26	23
Able to work properly during flood		
Yes	15	13
No	88	79
Dependent	10	8
Children sent to school		
Yes	38	34
No	63	56
No schooling children	12	10
Health services received		
Yes	26	23
No	87	77
Access to Internet		
Yes	101	89
No	12	11
Access to electricity		
Yes	97	86
No	16	14
Stress during flooding		
Yes	107	95
No	6	5
Common source of drinking water		
Borehole	104	92
Unprotected well	9	8
Protected well	0	-
River	-	-
Others	-	-
Source of water affected by flood		
Yes	88	78
No	25	22
Sanitary Facilities affected by flood		
Yes	81	71.7
No	32	28.3

Although flooding usually occurs from July to October, there is no a particular action taken to help the vulnerable populations impacted by flooding. Government intervention is necessary to address these issues and to mitigate the effects of future floods. Lack of access to health services, insufficient sanitary facilities, and the inability to work can cause mental health challenges. The impact of flooding could have been lessened by issuing timely flood warnings and proper preparedness plan, effective evacuation processes, proper access to medication, and

a suitable management or rehabilitation plan. The government should develop a comprehensive flood control or prevention plan and pay attention to areas prone to flooding. Stakeholders including governments, NGOs, industries, academia, and individuals should make efforts collaboratively in supporting affordable housing, health care services, food and drinking water to victims to mitigate the problems during flooding and promote the development of Smart Cities and also should allocate adequate fund to disaster management bodies for proper planning of the area.

Due to changing weather patterns and the variability of climate change, limitations exist with this study and its ability to be replicated in subsequent years. It is recommended that further full-scale studies be conducted over the coming years to understand how this variability can impact livelihoods and the communities who are affected by flooding.

4. Conclusions

The increasing rates of climate related natural disasters will continue to exacerbate the flooding effects on communities and villages in the Mandalay region of Myanmar. Flooding has already been a major issue for many communities and poses serious threat to their livelihood and socio-economic status. This study displays a small amount of impacts that flooding can have on individuals and families such as increased rates of stress, inability to find adequate water, and difficulty finding enough food for themselves and families. Many must relocate and are doing so in unsafe temporary housing structures along the side of major roads and highways posing additional threats of traffic accidents and air pollution. The cycle of flooding that occurs in Myanmar is known and understood at its current state creating a major opportunity for government officials and non-governmental organizations to step in and facilitate the smooth transition from permanent homes to adequate temporary housing that meets all basic living standards. From the survey it was found that many individuals relocate to monasteries in their villages posing another avenue of assistance. The cross-sectional study shows only one point in time and additional studies would need to be done to understand long-term effects of relocation and flooding on socio-economic status as well as mental health and well-being.

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