EROSION AND COMMUNITY RESILIENCE:

A Case Study of Shwetasoke Village, Kawa Township, Bago Region

Zin Mar Latt

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Foreword

The Understanding Myanmar's Development (UMD) Fellowship program, supported by the International Development and Research Centre (IDRC), Canada, is designed to the enhance knowledge of Myanmar's development processes, strengthen the capacity of Burmese researchers, and encourage them to actively engage the study of development policy and practice. The fellowship seeks to promote sustainable academic exchange and dialogue among researchers from Myanmar and Thailand. Under this program, 30 fellowships have been awarded to midcareer researchers in their respective areas of social and economic transformation, agricultural, environment and climate change, health and health care systems, and social media and innovations.

With this research report, Dr. Zin Mar Latt has taken a deep dive into the life of rural Myanmar and the heavy challenges people there face from not just environmental and natural disasters, but also the human-made responses and adaptations to them. The political and economic transformations accelerating across Myanmar have led to a vastly changed social landscape. In this new context, villagers in this area—which has experienced several flooding and erosion events in the last 50 years—now have to adapt a new set of tools to negotiate their livelihoods.

As more frequent and extensive erosion and flooding becomes the norm, Shwetasoke locals have relied on not only traditional methods—familial and community networks, changing agricultural practices and religious space, as well as ritual cermonies—but have also put to work new tools of an independent press, social media and advocacy campaigns, and even engaging the researcher Zin

Mar Latt herself as advocate-scholar to promote their agenda to academic and political actors at the regional and national levels.

As climate change looms in the near future as activator and multiplier of the intensity of these kinds of natural disasters, Dr. Zin Mar Latt's research stands as a critical case study of how communities exercise resilience to cope with drastic change and to maintain traditional ways of life, and also where they may be required to make serious adjustments, if not wholesale changes. Voices like this from the grassroots level will be crucial to fully seeing and understanding the extent and depth of rural transformation throughout Myanmar for policy-makers, aid agencies, and other communities that face a similar set of challenges moving into the future.

I would like to sincerely thank Dr. Zin Ma Latt for her immense efforts in studying how this particular rural community in Myanmar copes with natural disaster and overcome social and political challenges. I also appreciate Dr. Malee Sitthikriangkrai for providing mentorship and support to our research fellow.

Chayan Vaddhanaphuti, PhD
Director, RCSD

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I would also particularly like to thank for her advice and input, Dr. Malee Sitthikriengkrai from the Department of Sociology and Anthropology, Faculty of Social Sciences, Chiang Mai University.

Also, I would like to thank the team of RCSD, including Khun Kanchana Kulpisitthicharoen, RCSD coordinator, along with Elliot Lodge and Jeff Moynihan for their help in bringing my research to published fruition.

And of course, I would also like to thank all the interviewees for their trust and time who took part in my research; without them, this work would not have been possible.

Glossary

88 Generation Group

The 88 Generation Students Group was founded in 2005, taking its name from the 8888 Uprising, a series of student-led protests in 1988 opposing military rule. "Not a political party, but rather a movement comprising a generation of students who were active during the 1988 pro-democracy uprising."

Daw Khin Kyi Foundation

A charitable foundation established in 2012 by Daw Aung San Suu Kyi, in memory of her late mother, Daw Khin Kyi.

htamain An ankle-length wrap-around dress

nat traditional spirit (animist)

National League for Democracy

Daw Aung San Suu Kyi's political party

thanakha A white powder applied by women to their faces.

uposatha The four Buddhist observance days each month

Abstract

This research aims to explore the current vulnerabilities of a local community to soil erosion caused by tidal waves; to elicit alternative ways for villagers to adapt to their environment; and to find out their expectations for sustainable livelihood development. The research was conducted in 2016-2017. The qualitative research method was used to obtain data. Data collection comprised participant observation, in-depth interviews and key informant interviews (KII). The concept of community resilience is indicated by the ability of villagers to respond viably to surprising or unpredicted changes in natural and social environment. The villagers adapt to the new environment by calling on their experience of tidal wave erosion since 1974. When Shwetasoke village was swept away by a strong tidal wave villagers built a new community 7 miles away, whence most have been going outside to find job opportunities as the land is not appropriate for cultivation.

Keywords: Community resilience, Soil erosion, Environment, Shwetasoke village

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INTRODUCTION

Background of the study

This was my first visit to the field site, so close to my hometown, but I stood there shocked by what I was witnessing. A strong tidal wave came into the village from the Gulf of Mottama; the waves crashed against the riverbank and caused severe erosion within half an hour. The local people watched calmly as their land was slowly compromised by this devastating natural phenomenon. I had never seen this before, and was surprised by the immediate impact.

The tidal wave does not come to the Sittaung River at the same time each day. If it comes at 3:00pm today, it will come half an hour later tomorrow – a recurring pattern the locals are accustomed to. One villager said the extent of the erosion depends on the speed and direction of the wave - sometimes it comes in at high speed but without eroding the banks.

Shwetasoke villagers suffer this event for about four days every month, around the full moon. They are familiar with it as part of their everyday life, so they don't worry too much about it. On the way back to my friend's house some grandmothers asked her "How about the condition of the sea water today?" My friend replied that she was certain they would have to move to a new site because of the strength and direction of the current. I understood from my immediate observations that the whole community has

grown accustomed to living with these dramatic tidal fluctuations, and has become experienced in responding to the devastating changes in their environment.

The next day, I observed how the Shwetasoke villagers felt about yesterday's events. They went about their regular daily activities without worrying too much about erosion. I felt great empathy with the villagers, and wanted to know more about their lives. I thought about what had happened in Shwetasoke village in the past and wondered why they still lived there. I wondered how they would respond to this situation and why they did not move somewhere new. Were they satisfied with their lives? I continued thinking about their resilience and how they dealt with stress whenever they suffered this event. This desire to understand their ability to cope with this environmental issue motivated me to pursue this research topic.

There have been many previous examples of soil erosion across Myanmar which have forced local populations to take drastic measures, but there have been no studies done on the nature and effectiveness of community responses to these situations. I believe that anthropologists studying communities in Myanmar should focus on how vulnerable people adapt to these situations. Learning how people have coped with erosion and other environmental issues can help develop effective coping strategies for the future.

Research objectives

The objectives of the research are:

- To explore the current vulnerabilities of villagers facing sea erosion caused by tidal waves;
- To elicit alternative ways for villagers to adapt to their environment;
- To find out their expectations for sustainable livelihood development.

Research questions

How do villagers understand sea erosion in their environment, and the vulnerabilities they face?

How do villagers across different social classes develop resilience in facing their problems, and what coping mechanisms have been developed to deal with these problems?

How do villagers manage their land and livelihoods after sea erosion, and how do they expect to forge livelihoods in the future?

2

LITERATURE REVIEW

The increasing prevalence of soil erosion in Myanmar

Riverbank erosion is becoming a major challenge to rural development in Myanmar. It damages not only people's homes but also their livelihoods, according to the Department of Disaster Management. Professor Maung Maung Aye, an environmental resource and engineering consultant, noted that while erosion is a normal process in rivers, it becomes a big issue in Myanmar where people live on riverbanks. He noted that bank erosions occur on major rivers, such as the Ayeyarwady, Chindwin, Sittaung and Salwin (Aye Sapay Phyu & Myat Moe Aung, 2018).

From local newspapers and journals across Myanmar, it is clear that there are many examples of soil erosion in the country. The government supports infrastructure development, such as dams and canals, to prevent riverbank erosion and flooding. Likewise, non-government organizations and donors provide support to people who suffer riverbank erosion, by providing food and essential items. One example occurred in October 2012, where there was riverbank erosion in Theinzayat Region, near the Sittaung River; 56 houses were damaged and the occupants were forced to move (Flower News Journal, 2012). They faced not only immediate shelter issues, but also health problems and domestic water issues. Some land-owners complained that water problems affected their paddy fields. The Red Cross helped by providing tarpaulins; and the Dhammma Wantha Monastery donated two small baskets of rice per person.

The Irrawaddy (2013) reported that river erosion has led to the collapse of long stretches of riverbank along the Irrawaddy and Chindwin rivers in Magwe Division, central Myanmar, forcing hundreds of households in river communities to relocate to safe areas. The events caused 32 households out of 120 in Thahtaygone village, Yaynanchaung Township, to move in the days immediately after the collapse. The relocation of the local monastery and primary school, however, was more problematic; the eroded area had come within a hundred feet of the school, but to move it the community had to wait for permission from the township education office, without which they would have had to move the school by themselves.

In Nyamyargyi, Lay Yar Pyae, Ngar Lan, Nwae Ni and Aung Pan Kyaung villages in Yaysagyo Township, high water levels in the Chindwin River also led to the collapse of riverbanks. In each village some 150 households were threatened by the collapse and would have to move if erosion continued. In Nyamyargyi, the worst affected village, 180 families were forced to relocate as their homes were dangerously close to the disintegrating riverbanks. Local villagers complained that it was the third time that they were forced to move, as they also had to relocate in 1993 and 2012. They did not have enough savings to buy new land for relocation (The Irrawaddy, 2013). The report showed how, if erosion occurred every year, they would not be able to survive. The Yaysagyo Township and district authorities ordered the implementation of provisional measures, such as the construction of a retaining wall made with bamboo and reeds, but this did little to prevent further erosion and riverbank collapse. The report argued that Government policies for river system management were poorly developed under the previous military regime. Currently, international donors are working with the government to develop and fund management plans. South Korea has given US$4.2 million to the Irrawaddy River Master Plan, which includes an erosion prevention component. The Mandalay Division government is going to spend $1.1 million on riverbank reinforcement along the Irrawaddy over the coming years.

These examples show the rising incidence of erosion across Myanmar, and the greater attention being paid to improving the ability of communities to respond. However, there is a lack of

analysis of how communities perceive these events and how they adapt and show resilience within their own context.

Concept of community resilience

Resilience has been applied to analyze the capacity of systems at different levels - animal populations, human individuals, households, communities, regions or nations - to cope, manage or adjust to environmental changing conditions (Tuler et al. 2008). Community resilience is broadly defined as a community's collective capacity to function in, respond to, and potentially influence an environment characterized by continuous change, uncertainty and crisis. There is no universal mechanism for enabling community resilience (Lucy, Katrina, & Tara, 2018). Community resilience is a measure of the sustained ability of a community to utilize available resources to respond to, withstand, and recover from adverse situations.

Barrios (2016) makes a number of assumptions about the nature of communities and the practices that enable them to cope with or weather a disaster's impact. Holling defined resilience as a way to think about the relationship between environment and society and about the boundary between the two (cited in Davidson-Hunt & Berkes, 2000). At the same time there has been a growing recognition of the importance of local knowledge and practices. Since the 1970s, the realization has grown that local knowledge and practices can help implementing organizations to improve disaster preparedness activities (Dekens, 2007).

Lorenz (2013) argued that resilience means the adaptive, coping, and participative capacities of social systems. The social systems cover a wide range, from families to whole societies, and for "systems" one can read "communities". Every culture has specific forms of coping, such as grief rituals, that help assure connectivity with the past by handed-down social practices.

In this book, community resilience is defined by the ability of villagers to respond in a practical way to surprising or unpredicted changes in the natural and social environment.

Studies on community resilience in facing natural river displacement

A study on natural flood cycles in the Mekong river system (Hua, H.H., 2010) looked at different adaptive strategies used by local communities in responding to environmental disaster. The study analyzed efforts by the community to mitigate flood damage and the role of the government in responding to the crisis, which were different by different people across the community. The study reached a similar finding in highlighting the varied adaptive strategies employed by locals. Most significantly, it looked at the different outcomes faced by landless people who, as in Shwetasoke, were forced to depend more on external interventions and look to migrate to more environmentally favorable areas. He explored Long Phu village and O Long Vi commune in the Mekong Delta of Vietnam, subject to natural flood cycles, where the government implemented a residential cluster program which aimed to mitigate flood damage. Although the government supported land-owners and landless people by providing new land, landless people had to change their livelihoods; after resettlement, they lost access to fish and were unable to raise livestock, so they had to depend on other options, especially migration. It can be concluded that while government policy is to help all people, landless people are still adversely affected. Islam et al. (2012) explored local people's survival strategies and variations in their ability to cope with flood and riverbank erosion in two char (mid-channel island) villages in Bangladesh. Most of the people were affected by both flood and river erosion. The study showed that devastating river erosion occurred in Shushua char as compared with Degreer char in 2010 and that people tried to adapt to the adverse situation in their own ways. People of both chars experienced flooding for more than two months in the same year. Community members' adaptation to flood and erosion depended on education, income and occupation. Although floods and river erosion cause loss of lives and property, people's indigenous coping techniques could significantly reduce their vulnerability without outside assistance. An effective early warning system and integrating local coping practice with modern technology and improving socioeconomic conditions in a sustainable way is necessary to reduce losses from flood and riverbank erosion.

Smith and Sattineni (2016) found that flooding and erosion threatened the habitability of a significant number of Alaskan native communities. Relocation may be the only adaptation strategy that can protect them. It was recognized that in the US no government agency had the authority to relocate communities, no governmental organization existed that could address the planning needs of relocation, and no funding was specifically designated for relocation (Government Accountability Office, 2009). Even with their communities in imminent danger, none of the villages identified have yet been able to relocate. The relocation challenges faced by Kivalina and Shishmaref exemplify the need to create a governance structure which can better respond to the needs of communities. In the meantime, government agencies are spending millions of dollars to construct erosion protection infrastructure, which has an anticipated lifespan of only ten years, or sometimes 15 to 25 years if properly maintained. There is growing concern that such protective measures may reduce the urgency and slow the momentum towards relocation by creating a false sense of safety in the villages that need to relocate, thus prolonging their stay in dangerous conditions. Lessons have to be learned to guide communities and government agencies to transition from protection in place to community relocation, before a location becomes uninhabitable because of climate change.

Faulkner, Brown & Quinn (2018) stated that in the case of two coastal communities in Cornwall, U.K, both locations' perceived place attachment enhanced perception of community cohesion and was instrumental in mobilizing community resilience. Attachment to place provides a catalyst for individuals to come together as a community based on their shared experience of the place where they live, which in turn supports community cohesion and efficacy.

3

RESEARCH METHODOLOGY

I first became involved with the community of Shwetasoke during the rainy season of 2014. After hearing that new sea erosion was happening near the Sittaung River, I wanted to observe it. However, at that time I didn't know where exactly the sea erosion was happening. In April 2015 I visited a cousin, who lived near Shwetasoke. Her parents used to live there too but had relocated to Bago about forty years ago when their farmlands were eroded by seawater.

My cousin explained that her son-in-law, his parents and his uncle's family had all moved to Inn-win Ward in Bago town after the 1994 erosion. Her son-in-law talked about the current situation of Shwetasoke village. His uncle also explained about his family life, explaining that he wanted his children to be educated; his eldest son is now a grade seven student. He explained how some Shwetasoke villagers collectively settled in Inn-win Ward in a previous generation, and that they were now mostly wealthy people.

In May 2015, I planned to visit Shwetasoke village with my cousin. We took the two-and-a-half-hour journey to the village by motorbike taxi. The motorbike taxi driver instructs his passengers to avoid sitting side-saddle on the rough dirt road, a problem for me as a Burmese woman wearing a *htamain*[1]. At first, I resisted, but the pain caused by the rough road forced me to listen to my

1. An ankle-length wrap-around dress

cousin and change my sitting style. On the way I saw another woman with a htamain riding a motorbike in this position and I realized this was the local way. Being ill-prepared for the dirt road I also lacked a face mask, which all the locals sported on their journeys. On the way to the Shwetasoke village, I also saw a truck bringing drinking water to the community, and realized this was another issue facing the locals. These experiences during my initial visit to the village in 2015 gave me a first idea of the challenges.

Arriving at the village entrance with farmlands on either side, I quickly took in the formation of the village, noting in particular that there were no fences separating each plot, so that we could easily move from one place to another. My friend was surprised when we arrived at her house and explained why we were there. As her family talked to me about the situation of the village, a neighbor came in and talked about how his land had been affected by sea erosion.

On this initial visit I learnt from further conversations with the village headman that the community is situated about three miles from the mouth of the Sittaung River, and that villagers face tidal fluctuations regularly at full moon. Though other villages such as Mamauk and Kathitkhone are situated along the river, Shwetasoke village is the closest to the river mouth, and had encountered erosion by tidal waves twice previously, the third period of heavy tidal fluctuations beginning in 2015 and still continuing at the time of publication. The village riverbanks have been swept away by the Sittaung River over this period. During this visit, I became closely connected to several key members of the community and these key relationships enabled me over time to understand the daily life of the villagers, and to begin to advocate on their behalf. My methodology was therefore of an informal nature, with data collected in an organic way, through building these relationships.

Study site

Shwetasoke village is situated in the north-eastern part of Kawa Township, Bago Region, and is about three miles from the banks of the Sittaung River which runs into the Gulf of Mottama (see figure

1). It is the closest village to the mouth of the Sittaung River and hence one of the most vulnerable in Kawa Township to erosion by sea water. To the east of Shwetasoke village is the Sittaung River and Kyaik-hto Township, and to the west is Ngwe-taung village. To the north is Kathitkhon village, Thanatpin Township and Sarphyusu. Ta-dar-U, Kantaw and Ma-mauk villages lie to the south.

According to the Farmland Management and Statistics Department (2016), the village area is about 1655 acres (2.59 square miles). The total population was 1160 before erosion by sea in 2015, but due to gradual erosion and relocation it is now down to 890. Total households have reduced from 235 to 144 (source: Office of the village headman, 2016).

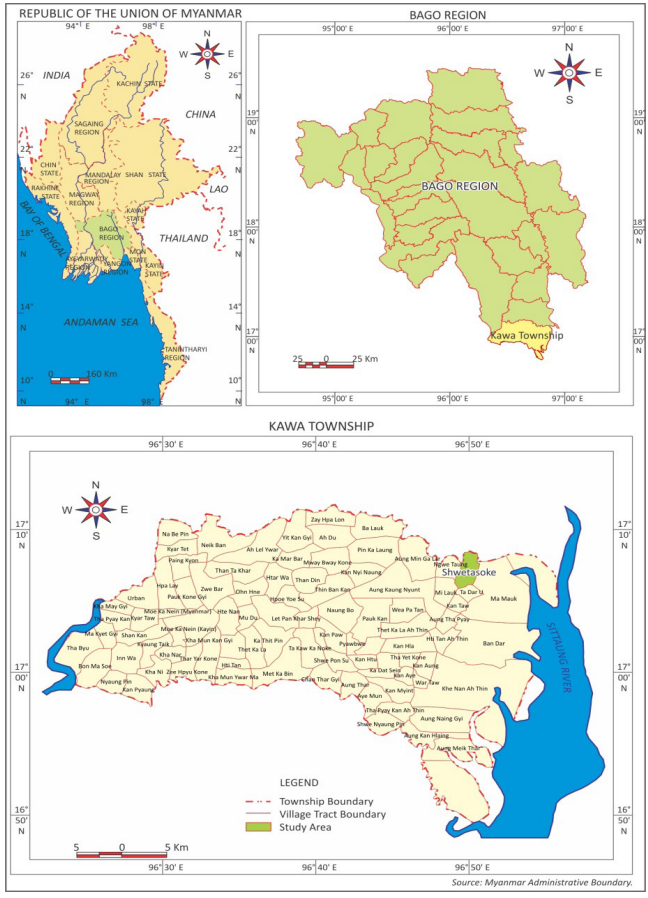


Figure 1: Location Map of Shwetasoke village, Kawa Township

Shwetasoke village communications

During winter and summer, there is only one bus from the village, departing at 4:00 am and arriving at Bago around 8:00 am. Because of the difficulty of reaching the town, most villagers use the bus only to bring commodities and other necessary items from Bago. The bus fare is 5000 kyat ($4), and if the villagers can't afford it they can find a longer but cheaper journey. Most usually go to Bago town by motorbike taxi, which takes more than two hours. There is other public transport in the village which is cheaper than the motorbike taxi. A few villagers go to Bago town on their own motorbikes.

The first half of the road to Bago - Shwetasoke to Yitkangyi - is the dirt road described above. It is particularly difficult to use in the wet season, when it is largely inaccessible. In that case villagers reach the town by outboard motor boat, via Kamarsae village, which is about 14 miles from Bago Town. This is around a two-hour journey and costs 2000 kyat ($2.50).

4

FINDINGS

Shwetasoke community history

Before the British colonized Myanmar in 1885, the land where Shwetasoke village is now situated was forest, inhabited only by deer, wild pig, and other wild animals. Most villagers interviewed thought that some people from Yit-kan-gyi village, about 7 miles away, had come there to collect firewood and realized that the land was good for cultivation, being situated near the river. There was previously a lake, where the monastery is now, which provided water. A 55-year-old land-owner, whose grandfather was one of the founders of Shwetasoke village, said:

> My mother told me that her father settled here with his friends. They chopped down trees, cleaned up the area and created a plot of land to live on. They did not need to pay any money.

Migrants came from Yit-kan-gyi and Kathit-khone when they heard from their relatives and neighbors about the fertile land. A 69-year-old farmer who was born in Kathit-khone village said:

> I was born in Kathit-khone village, Thanatpin Township, and when I was 5 years old my parents' farmlands were eroded by sea and they moved here where there was plenty of free land for farming.

Some people married Shwetasoke villagers and followed their spouses. The British government recognized Shwetasoke village in 1919, and gave villagers not only farmland but also residential land, free of charge. These interviews evidence that Shwetasoke was founded over 100 years ago, with most incomers being from neighboring communities, shifting to an area known for its fertile land and ease of access to water.

Situation of the land

After observing the tidal fluctuation on the riverbank in April 2015, I found nearby the effects of the strong tidal wave as salty and low, eroded land (see figure 2). An older villager told me that the salty water can kill all plants and that owners cannot cultivate salty land.

Figure 2: Salty land, Eroded land

Shwetasoke village land situated near the sea water is white because of salt (see figure 3).

Figure 3: Salty lands after sea encroachment

Shwetasoke villagers' knowledge of the Sittaung River

There are no strong tidal fluctations in Myanmar's other major rivers, such as the Ayeyarwaddy and the Thanlwin. The Sittaung River bed is sand which can easily dissolve in water, while the other river beds are rock which can't be eroded easily by the sea.

> I saw soil erosion since childhood in my home village and it was not strange for me. The fluctuation of tidal waves happened every month. (see figure 5)

Figure 4: Tidal wave coming in from Gulf of Mottamaa

Figure 5: Erosion of riverbank by Gulf of Mottamasea waves.

A government official from the Agricultural Land Management and Statistics Department said that:

> The mouth of the Sittaung River has a notorious wave which prevents anything from the gulf of Mottama except small craft from navigating the river. Moreover, its strong currents can create sea erosion along the riverbanks where all the villages are settled, including Shwetasoke village.

Though Shwetasoke villagers are not afraid of the tidal fluctuation of the rainy season because the water level is balanced between the rain water and the river water, they worry about the tides in the months of Tazaungmon (October-November) and Tabaung-Tagu (February-March). A 48-year-old female said:

> All villagers know that Tazaungmon water means the sea water which comes from the Gulf of Mottama around full moon. Its acceleration is very strong and it can erode the riverbanks.

Challenges and coping strategies of the community in responding to soil erosion

Understanding local experiences from the 1974 and 1994 soil erosion incidents

All who live in Shwetasoke village experience the tidal wave each month and they are not afraid of the soil erosion. However, they are not happy about other impacts such as flooding in the village, and strong waves striking the walls of the houses.

There were major sea erosions in Shwetasoke village in 1974, 1994, and 2015. A 70-year-old farmer said:

> We villagers always encounter soil erosion at full moon. In the 1974 erosion, the strong sea current eroded as far as the Bayan tree situated in the corner of the village monastery and it fell down into the river. The second erosion happened about twenty years ago but without heavy damage. Following the 2015 erosion, the entire village fell into the river in February 2016.

Erosion by tidal wave in 1974

The first river bank erosion did not cause the loss of the village but affected only farmland. The total area of farmland eroded by the tidal wave was over 300 acres on which rice, beans, and sesame had been cultivated (see figure 6). This 1974 erosion eroded Shwetasoke village up to the boundary of the village monastery.

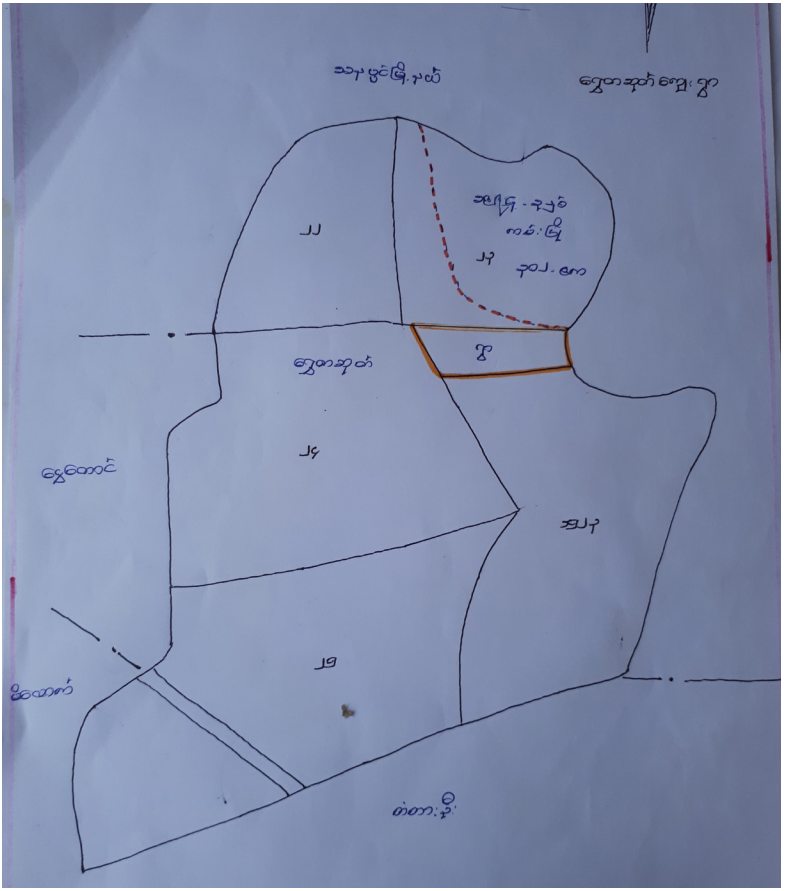


Figure 6: Erosion area in 1974

Shwetasoke villagers did not relocate after the 1974 erosion; the erosion did not affect all the farmland and villagers continued their work. However, some land-owners moved in with their relatives, while some moved to Bago town because Shwetasoke village was situated near the mouth of the Sittaung River and robbers came from the other side. A 55-year-old man who owned over fifty acres of farmland said:

> At the time, I was 12 or 13 years old and my parents moved temporarily to Yit-kan-gyi village where my mother's relatives lived. They left me with a granary

> and the house because they planned to come back to the village to cultivate paddy, beans and peanuts

They did come back to the village and continued farming - but some other owners had lost their land.

Support from the government

There were no social welfare associations in Myanmar at that time, and the government did not provide money or other necessities to vulnerable people. However, they did build a big embankment - the "prevention of salty water embankment". The embankment ran for about fifteen miles from the west of Shwetasoke village to Thone-hnit-kwha village near Thanatpin Township. Nowadays, the embankment has fallen into disrepair.

Preventing erosion

To prevent riverbank erosion for the future, villagers prayed to the monks with offerings such as alms food, desserts, and soft drinks. They offered fried sweet pan-cake made from glutinous rice to the U-shin-gyi spirit (nat). Monks recited Buddhist teachings.

At that time, most land-owners did not build embankments because they could not afford the expense. Only a few land-owners individually protected their farmland from the salty water. Sometimes strong tidal waves and current flooded the village and into the farmland unexpectedly. To keep salty water out, some land-owners raised the boundary lines of their farmlands (figure 7).

Figure 7: Building embankments

Sharing sandbank lands

After the 1974 erosion, sandbanks emerged on the riverbanks and government staff and the village Land Management Group collectively parceled out "sandbank" lands as compensation by drawing lots. (The Land Management Group is a group of village elders who collaborate with the village headman to manage village affairs. There are five members in the group, all men over 60 years old. They were chosen by villagers' votes).

According to the rules of the Agricultural Land Management and Statistics Department, priority was given to vulnerable people who had lost farmland - provided they settled within the boundaries of Shwetasoke village. They could not get the same acreage in the same place; but compensation was proportionate. As a second priority, the officials, the headman and the Land Management Group discussed sharing the rest of the sandbank lands among landless villagers.

Villagers who got farmlands from the government did not pay for the land, but had to pay for transportation and meal expenses for the government officials. A 71-year-old who has experience and knowledge about sandbank lands said:

> During the first erosion, the total area of my farmland was only seven acres but I got twenty-five acres as compensation because I helped the government officials from beginning to end.

Some land-owners bought more sandbank land because of its good quality. A 55-year-old farmer, owner of over fifty acres of farmland, said:

> Due to the age of the sandbanks, the produce was good and most owners were wealthy after the first-time erosion. I grew peanut; I can produce nearly eighty baskets from the sandbanks. Normally that acreage would produce only 30-40 baskets.

Due to salination the sandbanks cannot be cultivated immediately. They were good for cultivation about fifteen years after the erosion.

Thus, farming started only in 1989-1990. During the intervening period, some owners hired out their cows to other owners, and some rented other paddy fields, and paid with a percentage of the output. The price of hiring farmland depends on the type of land. A cow owner who rents land from a farmer said:

> I don't want to work under the control of others. Now I rent sixteen acres situated near Kha-yan-thone-gwa village and I share with my friend by paying 10 baskets per acre.

The majority of male laborers worked not only in the village but also as daily wage workers in neighboring villages such as Mie-lauk, Ngwe-taung, and Aung-minglar. They also caught fish and collected crabs in the sandbanks round about full moon. Thus, they got more opportunities to earn money during the interval period. Only a few laborers hired themselves out for the entire season.

Manual laborers earned daily wages every summer helping land-owners to prepare their farmlands to keep out the salty water. Other work opportunities were provided by house owners rebuilding or repairing their houses before the rainy season.

Without going outside the village, housewives could work by transplanting, harvesting and pulling bean plants in farmlands not eroded by the sea wave. One said:

> After the sea went out, I searched for crabs with my child (ten years old) and then sold them to duck owners; the sandbanks give us food.

After the 1973 erosion, not only land-owners but also manual laborers got more livelihood opportunities due to the sandbanks. Consequently, migrants from neighboring villages moved to Shwetasoke village and the village population increased. They settled by the long embankment situated to the west of the village.

It can be concluded that due to this erosion manual laborers had good opportunities searching for crabs as well as working in sandbank lands. Likewise, the land-owners got more profit. A lot of new sandbank lands were formed after the erosion where people got land free of charge.

Erosion by tidal wave in 1994

Shwetasoke villagers started farming again in 1989-90. Unfortunately, the Sittaung River current was not stable and in 1994 it destroyed farmlands for a second time, although the damage was not as heavy as with the 2015 erosion - only 250 acres of farmlands were lost and nobody needed to move away (see figure 8).

Figure 8: Erosion area of 1994

Sharing sandbank lands

When sandbank lands were shared to the villagers after the second erosion, victims got only five acres because the amount of new sandbank land was less than before. The new farmlands were cultivated for about 8 years. A former land-owner said:

> After the first erosion, three species of grass grew in sandbank lands and then beans and paddy were cultivated there. According to my experience, the older the sandbank lands the greater the profit. However, after the 1994 erosion only one or two species of grass grew on the sandbank lands and the produce was not good.

In 2006-2007, a few land-owners who had over 30 acres discussed with the village headman and Land Management Group different ways to prevent the salty water coming in. For the long term, the village headman and elders rented out 20 acres of common sandbank land to businessmen for village funds and put the rent money by to use for village affairs.

However, the fund was not enough as embankments needed repairing several times (see figure 9). The village leaders decided that each household should give their quota in building new embankments.

Figure 9: Embankments built by villagers

Employing different coping strategies and using experience in facing the third phase of sea erosion

The 2015 experience of sea erosion was the most devastating for Shwetasoke villagers. The waves crashed against the village riverbanks, leading to widespread erosion of village land along the river (figure 10). Villagers were forced to take drastic action to respond to this environmental crisis. While the experience and knowledge gained from previous erosion periods was valuable, the

scale of the third erosion forced many to migrate. Other responses are explored here.

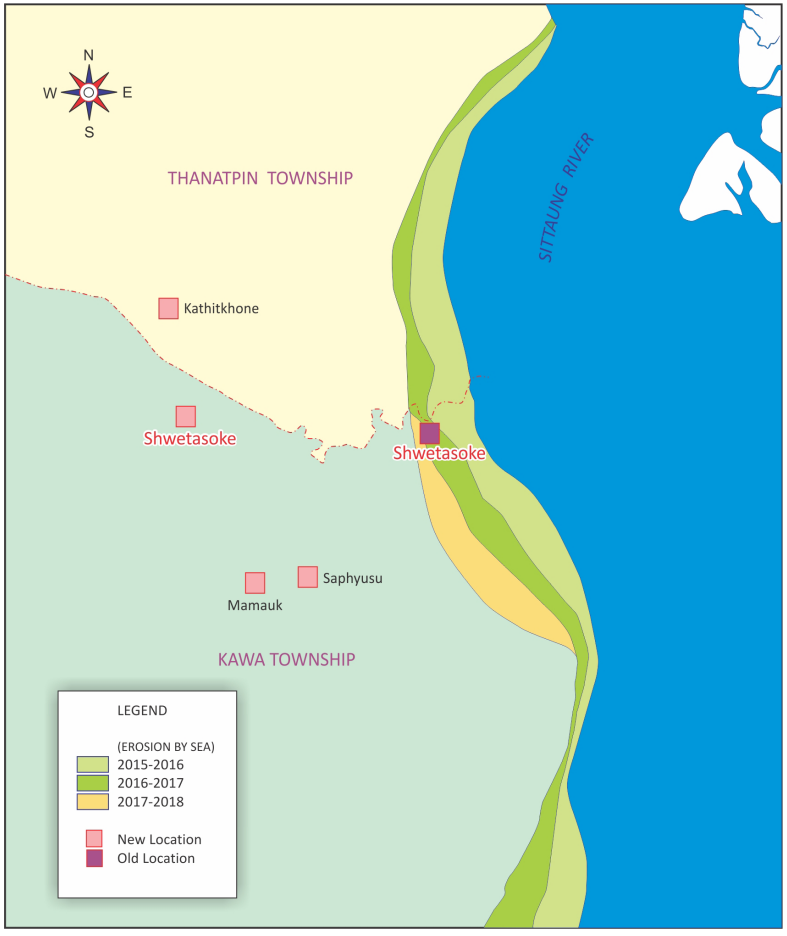


Figure 10: 2015 erosion

When the 2015 erosion happened, most villagers were initially unwilling to relocate—they loved their village and wanted to carry on living there together under their village headman. For people without farmland, such as manual laborers, they could earn income locally through activities such as fishing and farm work. Moreover, manual laborers can rely on their social networks for survival, and even if they have to borrow to buy clothes or rice, they can do so through these networks because of their community

trust. But they do not have enough money to move out of the village, and despite earning 5000 – 6000 kyat per day as wage laborers, there is no guarantee of steady work should they choose to move to a major town.

Initially, villagers with experience of previous erosions in 1974 and 1994 thought that this event would likewise not sweep away all farm and residential land, and that the effects of the 2015 erosion would be manageable as in the earlier cases. One land-owner said:

> In the village, my elder sister built her house with brick and wood over two years ago (2012). We never thought that tidal wave erosion would sweep village land into the Sittaung River, because of our previous experience.

As long as they had access to drinking water (at the village monastery) they decided to stay. Shwetasoke villagers, despite their different social classes, remained fairly united. There is a Burmese proverb: *Moepyoe yin amyar be*; meaning, "if the sky falls down it affects us all". For the locals this meant that if sea erosion happens in the village it affects the entire community and all villagers will be its victims.

A land-owner who has over 80 acres of farmland said:

> I can farm in the village. If I move to Bago, what shall I do? I don't want to relocate to town.

Both the monastery and the school, which face each other, were washed away in the first week of December, 2015. The tidal waves flooded the village land for about two months. Then in May 2016, the entire village was swept away. The villagers moved to a new site nearby.

Challenges and coping strategies

In the coming chapters, this book will discuss in greater detail the environmental events and vulnerabilities that forced the villagers to engage in their various coping strategies. After the soil erosion rendered the previous village site untenable in 2015, the village was

rebuilt on a new site a mile away. This short section explains the differences in livelihoods and infrastructure between the old and new sites, before further erosion forced them to search for another new site in 2017. The purpose of this is to provide a snapshot of the village livelihoods and economic structure during these periods.

Relocating to the new place

While Shwetasoke villagers planned to relocate for the first time, one local family head owning over 80 acres of farmland donated 20 acres to the village "because Shwetasoke village was his home town and he wanted to help vulnerable people who had no land for their houses". The Land Management Group used these lands to build a monastery and a school, as well as to construct roads. They bought 25 acres from another land-owner for 300,000 kyat per acre and divided it into 80 x 80 feet plots, which they sold to victims, chosen by lot, at 20,000 kyat per plot. The new plots were not necessarily as large as the ones they had lost. The community leaders decided to continue with these sales until the end of April, when the remaining lands would be offered for sale to any villager who wanted to buy. However, there were no buyers because of the bad situation. Some manual laborers lived on those plots but paid no money for a long time. By June-July of 2016 there were about eleven manual laborers who still had not paid for their plots. Fortunately, the owners who sold the plots were Shwetasoke villagers and the village headman and the Land Managing Group collectively told them to wait a few months. This was an example for village leaders for the future.

By February of 2016, the majority of households (69.44%) had moved to the new site. 30.56% of households moved outside the village area: 23.15% settled in Cowherd Pagoda which is about one mile from Shwetasoke village, where they have to pay

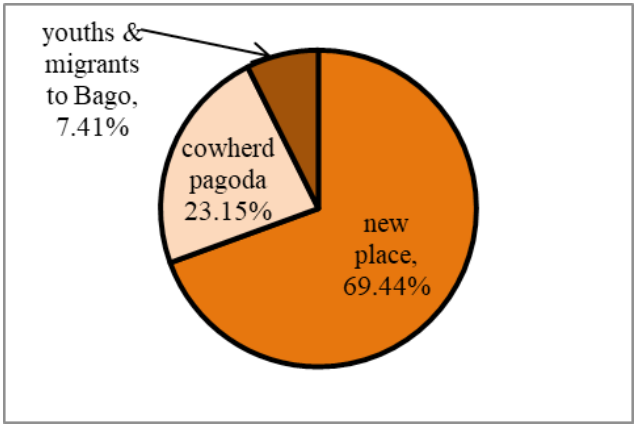


Figure 11: Percentages of migrated population from Shwetasoke village

100,000 kyat per plot; the other 7.41% - youths and landowners - moved to Bago Town and its environs (see figure 11) (Office of the village administration, 2017).

This situation was not secure for the future. A 45-year-old man who sells bamboo and nipa palm for houses and who is also a health worker, and who has moved to Hlaing-Tharyar ward near Yangon Town said:

> When I married I moved here. The future condition of Shwetasoke village is not secure, so my wife's uncle who is from Yangon suggested that my family should follow him, and I decided to follow his plan.

Job opportunities are scarce for village youths. Although some find work on the land or driving motorbike taxis, many go to work in Myalymyine, Myawaddi, and Mae-sauk towns for 8,000 kyat per day, helped by their network of friends. They come back to the village to pay homage to their parents and grandparents at holiday times such as the full-moon day of *Waso* month (June-July), and *Thadin-gyut* month (September-October). Some young people, both male and female, work at factories in Banar-gone village, Indakaw Township, Bago District, where they earn about 4,000 kyat per day - their families relocated there about a year ago.

The livelihoods of members of society depend on the natural environment. Their socio-cultural systems, especially family structures, can change due to erosion.

Livelihoods

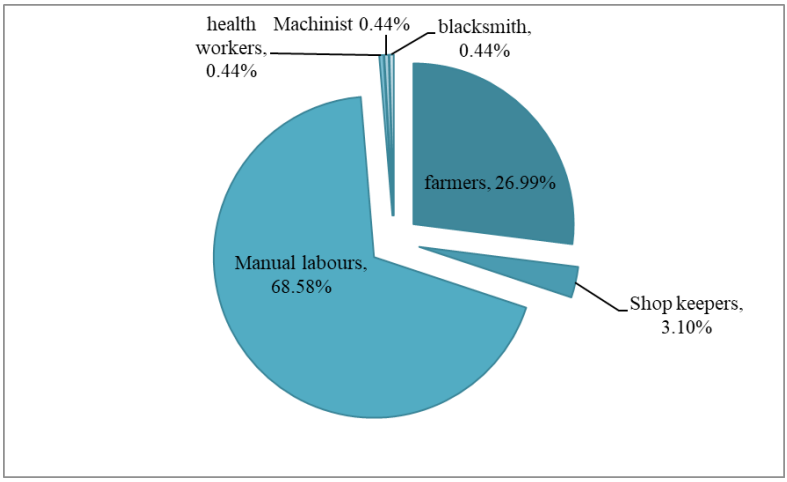


Figure 12: Livelihoods of household heads in Shwetasoke village [2]
Source: Office of Shwetasoke village headman (2015)

Figure (13) shows that the majority of households, 73%, are landless, while only 26.99% are landowners. Among the landless groups, manual laborers are the majority (68.58%), with health workers and technicians at only 0.44%. Manual labor means daily wage workers who do not have a stable source of income; they do different jobs - digging land, building houses, fishing, driving motorbikes and motorboats - depending on the seasons. Mostly they earn about 6000 kyat ($5) per day. Usually, they go fishing or picking crabs at full moon not only for their family but also to earn money. Some seasonal workers such as motorbike drivers can earn about 10,000 kyat ($8) per day.

Some farm laborers work all year on the same farm, and they get

2. Manual laborers are hired farm workers, carpenters, fishermen, motorbike drivers, motorboat drivers, others earning daily wages.

about 500,000 kyat ($385) per year (2016). They usually work from 6:00 a.m. to 6:00 p.m.

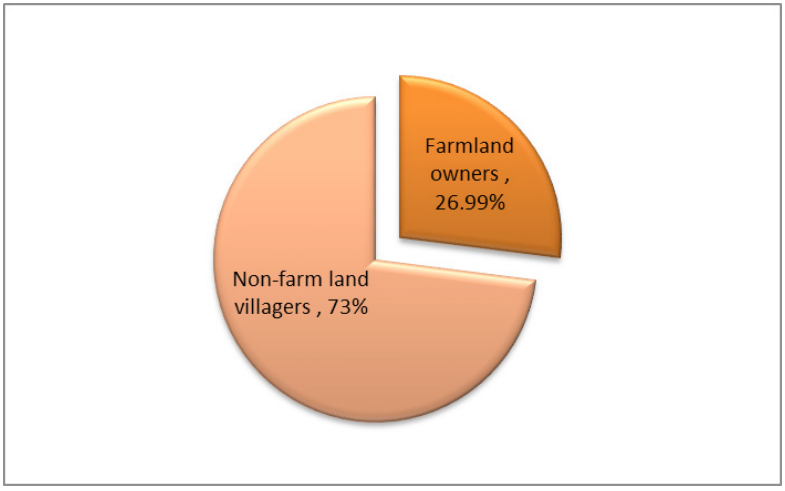


Figure 13: Proportions of land-owners and landless persons
Source: Office of Shwetasoke village administration (2016)

Landless households

Some housewives said that before the 2015 erosion they did farm work in the village, but that today there are few farms left because of the erosion. And land-owners have switched to seed cultivation because of low expenses. The wives said that they could not do this work. So, they stayed at home doing the housework and depended on their husbands' earnings. During the summer season they could go harvesting beans in neighboring villages - their children followed them and looked after each other.

Some housewives did transplanting or harvesting for farmers in neighboring villages. There were two types of pay for transplanting: the first was pre-paid money, and the second was piece-work. Most took pre-paid money at 1000 kyat per day instead of the 1500 kyat they might earn by piece-work. Their daily wages were less than men's but were useful for household expenses because their husbands sometimes lacked a daily wage.

While villagers relocated to the new village manual laborers earned more money by dismantling old houses, building new ones, or

fishing. Due to support from the government and NGOs, they could save something from their daily wages but it was not enough for all expenses. For housing, they bought bamboo, dani for roof, and big poles by borrowing from the sellers. The expenses for a bamboo house were about 150,000 kyat for manual laborers. A manual laborer said:

> My house has not yet been moved to the new village. For me, this time is convenient to find money because now some moved to the new village while some are re-building the old house there. I get 6000 kyat per day but I have four children and I couldn't save enough money to move to the new village.

A 55-year-old male who is a daily wage worker said:

> Jobs are easy for me to find because most people are building houses while others in the new village as well as in neighboring villages are preparing their farmlands and houses to keep out the salty water. Now I have no free time.

A 40-year-old villager told me that landless villagers built their houses themselves. They could not normally help each other because they were struggling to earn a living. However, they did help each other for one or two days with the foundations (see figure 14).

Figure 14: Moving to the new site and building a house

The village headman and elders created job opportunities for manual laborers in the construction of new embankments. They used manual laborers to dig the land and build embankments, saving on the renting of trucks. At that time daily wages were about 10,000 kyat. Other village leaders visited Shwetasoke village and checked Shwetasoke manual laborers' skill in building the new embankments. They liked what they saw and used Shwetasoke village laborers in building new embankments in their own villages.

Figure 15: Breeding ducks

Land-owners

For land-owners, the salty water had entered their farmlands and thus most of them could no longer do cultivation. Most changed to husbandry such as chickens, ducks, and pigs. They breed 50 to 100 ducks because a six-month-old duck can give eggs for household expenses. According to the village headman, one farmland-owner said:

> Due to salt water, I can't do farming on my farmland. Now I breed some chickens and ducks. If one profession is not convenient for me I will change to another (see figure 15).

Some farmers took their farming equipment such as tractors to the eastern part of the Sittaung valley to do farming there. Others have changed their livelihoods to residence-cum-shop where they sell commodities such as kitchen goods, cloth and so on. A wife of the land-owner who had 50 acres said:

> Now I open a general store in the house while my husband rents his machines for cultivation to others.

Before the third erosion of 2015, land-owners grazed their cows in the farmlands after growing beans in the summer season. However, in the rainy season paddy was cultivated on the farmlands so the cowherds had to look for grazing land far away. Nowadays, the salty water floods the farmlands and they are no good for

cultivation. So, cow-owners can freely graze their cows on those farmlands and do not need to seek out pastures new.

Loans and credits

During the first and second erosions, landless villagers obtained foodstuffs and miscellaneous commodities from the village shops on credit with very easy terms (a slightly higher retail price, but no interest). Before the erosion, the shop-owners would give the manual laborers credit of about 15,000 kyat, but afterwards they would allow only about 5,000. The landless villagers had financial problems. One mother of three children said:

> We can't repay the debts on the due dates but we have never lied to them. We stand up to our promises. If we don't pay back, they will never trust us.

When manual laborers need money they usually borrow at an interest rate of 20 per cent from wealthy people.

After 2016, all land-owners got loans for farmlands of 50,000 kyat ($38.46) to 100,000 kyat ($77) per acre, with 0.37 % interest. Later the government increased the loans to 150,000 kyat ($120) per acre. According to the rules and regulations of agricultural loans, farm-owners had to repay the loans to the government before the next year. If a farmer does not repay, he misses out on future loans.

Before the 2015 erosion, 39 farm owners in the village were in default and did not get the new loan in 2016. According to the statistics of the village administrative office, 120 farmers got loans in 2016 but then the sea washed their farmlands away and they were unable to repay. The farmers explained their circumstances to the office of the President, and the government did not press for repayment. The farmers were in any case not eligible for the 2017 loans as their farmlands had disappeared.

Each farmland-owner was allowed one loan quota for up to ten acres of land, which had to belong to one household. Owners with more than 10 acres could get additional loans by dividing their land among their children. For example, if a farmer had 50 acres he could allot 10 acres each to each of his children or, for example,

his sisters. Suppose the permitted amount of loan is 100,000 kyat per acre, subject to the maximum of 10 acres. If the farmer shares out the land into 10-acre blocks, each block will get a loan of 10 x 100,000 kyat = 1,000,000 kyat, or 5,000,000 for all 5 farms. If he did not share out his lands he would get only the maximum permitted 1,000,000 kyat for the maximum 10 acres.

Techniques to save shelters

I observed two types of housing style when I visited the village in 2015. My friend's house is bamboo with a bamboo floor. The poles of the house are also bamboo and the house is raised about two feet from the ground to prevent it flooding. The two glazed earthenware pots in which the rainwater for drinking is stored are sunk into the ground. When I observed neighboring plots I saw a big two-storey house built of bricks and wood. My friend explained that while most houses are bamboo, there are about 30 two-storey brick and wood houses belonging to land-owners, who also have houses in Bago (see figures 16 to 19).

Figure 16: Bamboo house with bamboo floor

Figure 17: The village headman's house built with brick and wood

In the new village, I noticed that most houses were built of bamboo with only four small wooden houses owned by land-owners. A 75-year-old villager who had lived in the village since childhood explained that the new site was not stable. Land-owners sold their old wooden houses for about 2,000,000-3,000,000 kyat ($1600 -$2500); some built only small wooden houses at the new site. One of the land-owners, the village headman himself, built his house with bamboo even though before he had built with brick and wood. While the old village had high land for home construction, land at the new site was all low-lying.

Figure 18: A landless villager's house

Figure 19: A land-owner's house

Shwetasoke villagers have coping strategies in case of erosion. At the new site, coping strategies are similar for all the villagers. Since ancient times they have mostly built their houses, feeding troughs for pigs, shelters for ducks and cowsheds, on stilts or on earthen platforms to prevent flooding. They built the houses with bamboo and a *dani* (palm) roof.

Similar techniques to protect against flood and erosion risk can be found in other flood-prone areas such as Bangladesh (Paul & Routray, 2010). In Zimbabwe, the Muzarabani prefer huts and houses which float during flooding events. (Mavhura et al. (2013).

During the first field trip in 2015, I visited the village monastery. It was a two-storey brick and wood building (see figure 20). Different species of big trees can be seen around the monastery, and a lake which villagers used for drinking and domestic water.

After erosion in 1975 20 acres of common sandbank land were rented to farmers. The value of this land increased and the village leaders sold it and added donations from land-owners for monastery building. Finally, they built the new monastery as a collective effort, demonstrating the Shwetasoke villagers' collective spirit.

When the Shwetasoke village was relocated to the new place in 2016 due to erosion, the design of the monastery was changed to a single-storey wood and zinc building, with bamboo poles and wooden floor (see figure 20).

Figure 20: New design of the village monastery in the new village

During the first field trip, I observed a primary school next to the village monastery (see figure 21). My friend told me there were altogether 201 students. Most parents could afford to send their children to the school—there were no extra expenses. After graduation from primary school, some parents sent their children to the high school in Wae-pa-tan village about 5 miles away. The parents' lack of education restricted them to laboring jobs and they wanted their children to be educated. Despite parents' poor earnings, most children can be enrolled in primary school. But boys have no chance to continue to high school – they can go out to work, and earn more than daughters.

Figure 21: The Primary School at Shwetasoke village

After they moved to the first new site, the government supported a new primary school for the villagers. Unfortunately, the new site could not prevent erosion and when they had to move again the village headman and elders organized for each household to contribute 10,000 kyat ($8) to build a new school. Village funds were added. It was built with bamboo (see figure 22), without government support. This is similar to the case of the two coastal communities of Cornwall, U.K reported by Faulkner, Brown, & Quinn (2018).

Figure 22: New primary school built of bamboo in the second new site

In my first field trip to Shwetasoke village I found a big problem - there was no toilet in my friend's home. There are several bushes in the old village and as they are on high land, people used the bushes as toilets. My key informants said there were few toilets in the village before 2015.

The new place they moved to in 2016 is on low land with few trees. Getting rid of body waste in these low lands is unhygienic. With government funding, a hundred toilets were built in the new village.

Strategies to save water resources

While I visited Shwetasoke village in May 2015, I saw one of the host family members go to fetch water from the lake with his bullock cart. Most people carried water on a shoulder yoke while some hired bullock carts from a neighbor.

The lake was situated in the compound of the village monastery. The surface is covered by water hyacinth and there are different species of trees around the lake. I felt that it was a very pleasant, fine, cool, and peaceful place (see figure 23). The lake could be reached in about fifteen minutes from my friend's house in the west of the village. Despite seeming shallow it provided all the villagers not only with drinking water but also water for domestic use, until April-May of the summer season. My friend's family stored rain water for drinking and domestic purposes in glazed earthen pots which are sunk besides their house.

Figure 23: Fetching water from the lake in the old village

When I went to the village in May 2016 it had moved to the new site. Both the school and the lake had collapsed during the last week of December 2015 and all the villagers faced difficulties with the water supply. For domestic use, landless families—mainly girls over 12 years old—were carrying water with shoulder yokes from Melauk village, situated about one mile away. Some land-owners carried their water by bullock cart (see figure 24); and one by tractor. Water was usually fetched in the early morning and evening when it was cooler.

Figure 24: Fetching water from a site near the new village

The government and some social welfare associations provided drinking water in the summer.

Market, electricity

There is no market in the village because it is too small – just small residence-cum-shops selling groceries, and mobile vendors selling meat, fish, groceries, and snacks.

There is no mains electricity. When they relocated to the new site they used solar panels to provide light at night, to watch television and videos, and listen to the radio and charge their mobile phones. In the old village, before the arrival of solar panels, they used batteries for lighting and charging.

Building the pagoda

One evening in 2015, I noticed a pagoda. It was built near the riverbank in the village. I asked my friend why the pagoda was built there, and she said that the aim of the pagoda was to make the sea wave go back to the Gulf of Mottama. It was known as *Pin-lae-pyan zeidi*; literally translated, "turn back sea water pagoda" (see figure 25). It had been finished about two months before, as a

collective effort by Shwetasoke villagers, monks and donors from neighboring villages.

Figure 25: "Turn back tidal water" pagoda

A woman who had settled in Shwetasoke had a dream where a voice told her to build a pagoda to protect villagers from sea erosion. At the time, many villagers felt helpless, with no one to depend upon except Buddha, so they decided to make merit by donating some money to build a pagoda. Some neighboring villagers also donated. Most Shwetasoke villagers believe that they will get merit by building a pagoda and consequently that traditional spirits (nat) will help them. They believe the Lord Buddha has more power than human beings and only he can prevent this natural disaster. They themselves cannot afford to escape serious phenomena but the Lord Buddha can prevent it. In other words, the villagers believe the process is natural, they have no agency to affect the issue and their only recourse is spiritual. Some men in the village didn't know what the dream portended for the village, but they didn't oppose building the pagoda. One land-owner said:

> I don't believe that the pagoda can stop erosion because the strong tidal wave and its current can erode the riverbanks at any time. But most villagers especially women are afraid of riverbank erosion and they built the pagoda collectively. I donated 1000 kyat.

Reciting Buddhist teaching

Unfortunately, the Pinlaepyan pagoda collapsed in 2015. Afterwards the monks from the village monastery recited Buddha teachings, like *pahtan*, four times each month on the 4 observant (*uposatha*) days from 6:30 p.m to 12:00 a.m. Villagers collectively donated ginger salad and gourd fritters to the monks and guests. Donations for alms-food for the monks cost about 7000 kyat ($6). Most villagers give labor service in the monastery.

Individually built embankments

During the 2015 erosion, most farmlands were very close to the river bank, and salty water got into their farms. A few land-owners individually kept their farmlands free from the salty water. One land-owner who had over 30 acres situated near the village border was able to continue farming as he prevented incursions of salty water with small embankments about 5-6 feet high. He said:

> Before the rainy season small embankments were built about 5 or 6 feet high to protect my farmland because I worry about the sea current which can flood over the land during the rainy season. This has been my habit since my grandfather's time and I usually prepare my farmlands like this in the summer season when the tidal wave is not expected.

At full moon in June 2017, a strong tidal wave flooded over the village and salty water got into his land. Following his knowledge and experience, he let the salty water out through holes under the land. It was raining heavily so rainwater fell on the land while at the same time the salty water was draining away through the holes. And he scattered paddy seeds although he knew that he would get little profit from that. If the soil is good for cultivation, it may

produce 35 or 40 baskets per acre. If not, the owner might get only 20 baskets. That is his experience. He keeps an eye on the sea at full moon and stands ready to protect his farmland.

Collectively built embankments

Since 2006-2007, the village headman and elders supervised the building of a new embankment and the repair of old ones. They did this several times before 2015. They checked the condition of the sea water at full moon every month. If village funds were not enough, each household had to participate in the building and repairs. Each household was told to watch the condition of the sea because the wave comes up twice every 24 hours. According to their knowledge, a south wind can cause a strong wave in the evening. Likewise, a north wind causes a strong wave in the morning.

Transportation in first new village

During the rainy season of 2016, they moved to the new village which was situated on land prone to flood. The ground was very muddy and the floodwater persisted for longer than in the old village. House compounds were flooded. The villagers went everywhere by boat, including the children going to school, although some parents carried their children on their shoulders (see figure 26). In the summer season it was dusty and windy.

Sending the children to school

The school boat was entrusted to a 75-year-old villager who provided the service each morning and afternoon. He said:

> In the old village, there was not always flooding but the new place is on low land which floods during the rainy season. The village headman hired me his boat and I felt sorry for the children who faced difficulties getting to school, so I rowed the boat to take them.

Figure 26: Going to school by row boat

Moving to the second new village

During the rainy season of 2016, especially on the full-moon day of the month of Thadingyut, due to that month's high tide, the villagers put their bed, their clothes and other valuable things on the top shelves because the water flooded into the floors of the houses. They worried that the strong currents might carry them out to sea.

One of the land-owners said:

> Shwetasoke was about 900 yards from the riverbank in 2016. Today (May 2017), it is only just over 300 yards away. So, this year we are much closer to the riverbank, and we decided to move to the next new place.

The next (2nd) new place was situated near Aung-min-galar village about seven miles from Shwetasoke village. Unfortunately, there was no budget for the move to the new place, where farmland cost 650,000 kyat per acre or over 24,000,000 kyat for 37 acres. The Shwetasoke villagers could not afford to pay the full cost of a plot. The village leaders sought help from the administrator of Kawa Township, but by the end of February 2017 they received no reply. I put the problem to the administrator of Bago Region in March 2017, and in April 2017 the government offered 12,000,000 kyat to Shwetasoke village from the new 2017-18 budget. Then each household had to pay only 100,000 kyat for one 90 x 90 ft. plot.

The village leaders changed the process for selling land to the villagers. The new procedure was that any villager who wanted to

buy a plot at the new site had to pay a deposit of 50,000 kyat to the village leaders to register. The household statistics of the village headman showed that there were about 80 households who wanted to buy land for houses, while some villagers opted to move away. Before marking out the new plots, the leaders called for one person per household to provide labor to move the village monastery, before they relocated to the new place. They have still to measure out the plots.

Due to the late government support, Shwetasoke villagers did not move to the new site until May 2017. Twenty households did not join the move; they bred ducks and needed a wide area for the ducks to swim. They nevertheless took plots at the new site.

After the move, some villagers went back to near the Sittaung River to go fishing and crabbing with motor-boats to earn more money. The motor-boats were rented. They were familiar with fishing and although they prefer to do their normal work fishing provides extra income.

Nowadays, Shwetasoke villagers live together with neighboring villagers with family members working in Thailand. They discovered that villagers who went to Thailand could send about 300,000 (kyat) ($230) back to their families every month, while the cost of going to Thailand was only about 600,000 kyat. Now 30 villagers who can afford the trip are preparing to go to Thailand. Manual laborers are still left in the new village doing their normal jobs because they have not saved enough money to leave. Grandparents and older parents stay on in the village with the children.

There are advantages and disadvantages for Shwetasoke villagers who moved to the new village. Transport is better than in the previous two villages which were near the Sittaung River. But a villager said:

> In previous places such as the old village or the first new village, we could get fish and crabs for daily food. But in the second new place there is no fish or crab because it is far from the sea. So, I really like the old place. But the new place also is convenient for me. Water convolvulus is all we can get here for food.

Moreover, the second new place is not good for health; in the old place the wind was warm but in the new place it is cold and villagers frequently get fever.

Support from government and non-government organizations

Since about the time of the 2015 erosion, when they were able to use it to get some support, most young people in Shwetasoke village use Facebook.

During the 2015 erosion, different social welfare organizations donated drinking water, dried noodle packages, and other household goods to vulnerable villagers. The government supported by building a monastery, the primary school, three water tanks for villagers and one for the monastery, and by helping with earth-moving. During the previous government, the minister of Bago Region, U Nyan Win and his entourage, visited the village and donated 500,000 kyat (approx. $380) for drinking water and other basic needs.

The Daw Khin Kyi Foundation and 88 Generation Organization also donated money and material to the victims at the beginning of December 2015. The village youth association received assistance from the Kawa Township National League for Democracy office, and as already noted a local family from the village donated 20 acres of their land for relocation. This was a first-time donation for them. There were other social welfare organizations that donated to victims of natural disasters. The victims received drinking water, dried noodle packages, and other household goods from donors in Bago Township (figure 27). Some who had moved away from Shwetasoke donated as much as they could because it was their home village. One 32-year-old Shwetasoke villager who lived in Naypyidaw said:

> I grew up in Shwetasoke village but now I am an engineer and live in Naypyidaw. I always care about my home village and I would support them if they told me what they needed to save the village from sea erosion.

Some gold shop-owners from Bago supported their customers from Shwetasoke village as much as they could. A gold shop-owner said:

> I have some customers from Shwetasoke village and they usually come to me whenever they want to sell or buy or pawn gold. I contacted one customer and now I have donated drinking water.

Figure 27: Sharing drinking water and other donations

In 2016, the Mottama Gulf maintenance group from Thanatpin Township gave 5,000,000 kyat not only for Shwetasoke village but also for other villages situated near the Sittaung River, to prevent the sea erosion. A donor from one political party supplied money, rice, oil and other needs to the village during the erosion period, because he had canvassed there for his party. Also, he had lived in Yitkan-gyi village as a child before he moved to Bago.

The relationship of the researcher to the community, and my advocacy role

During my time researching in Shwetasoke village I formed close relationships with the community, and as I came to recognize the urgent nature of their plight, I worked to advocate for external support to assist them. This chapter explains how these relationships were forged, and how I was able to work with the community to represent their interests.

When I visited the village in 2015, I met the village headman in his home. I introduced myself to him and then explained the objectives of my research. He was very welcoming and provided me with a good initial connection to the community. When I asked him about the statistics of each household, he phoned the village clerk, and provided some preliminary data. We worked together with the village leaders to gather information and statistics on households according to age, sex, occupation, and household numbers, which had never been done before. I helped him with his work and formed a close relationship with him and other village leaders.

While I was working with the village administrator, two 65-year-old villagers came along. I interviewed them to understand about their experience regarding riverbank erosion. Whenever I was walking and observing around the village I usually met with one of them; I followed him to his house and interviewed him about the history of the village and his life. That evening my friend, who sold things, went around the village to collect debts owed by customers. I followed her to observe or converse with villagers. While we walked round my friend introduced me to some local wives. One said:

> Some strangers came to the village and they asked me questions. After questioning me they did not pay anything. Now what will you do for us. If you ask questions like the others how much will you pay me after interview?

I explained:

> I am a teacher from the university and I can't pay you money. I have never seen the riverbank erosion before so I have come to see it here. But I will see if I can find some donors.

She was satisfied with my reply and I proceeded to interview her to understand her family's daily life. I chose her as a key informant because her feeling about riverbank erosion persuaded me to think about her life. I was familiar with some informants as I stayed in the village for about ten days. I was the only one looking around. I saw different daily activities of villagers according to age and gender; some household heads went outside for daily wages; some housewives were doing their daily household chores such as cooking, caring for their children, and feeding pigs and ducks; one grandfather was repairing his roof because he had only daughters; and young sisters were fishing in a mud depression.

Depending on my interest in a person, sometimes I entered a house and introduced myself to the head of household and interviewed him about his family life and gave him some gifts. Sometimes I met some housewives and did informal interviews with them. I tried to understand their feelings and their struggles.

Whenever I met Shwetasoke villagers over 20 years old, both manual laborers and house wives, I asked their age, sex, occupation, and total household family members. They were young, but looked older. Because they were not educated people they mostly got married at about 20 years old without thinking for the future. And their daily life was fraught with difficulties.

One day in April 2016 I came across two women and their children sitting in the stairway of a house. I greeted them and asked how they were. They said they had a problem because they couldn't get advance payment for transplanting paddy. Maybe they expected me to help, or maybe they were just telling me about their problem.

Some youths said most villagers liked the current village headman because he helped out in the village with his own money. When some donors came to support the victims he hosted them from his

own pocket. Some women said he could do all this because he was single and had no family responsibilities. Moreover, he owned some farmland. All the villagers wanted him to continue in his current position.

I wanted to know what was important in each household and I asked one of the house-wives. She replied that she could guess the condition of the sea wave because she was familiar with it since childhood. Each household always prepared for all eventualities and took care of important things such as household statistics, money and other valuables. No one wanted to keep everything. Women need *thanakha*[3] but when they move from one place to another they cannot bring it with them. Their wish is to stop the sea erosion happening in Shwetasoke village.

I had more opportunities to understand about Shwetasoke village during the second field trip in 2016 because of these close relationships. Some women would confide in me if I was alone, but not if my friend or another villager was there. This showed that they trusted me. They said they were facing challenges to find farm work because of the lack of farmland. There were now two groups of villagers; the majority who had moved to the new site, and a minority who had relocated about one mile away from the old Shwetasoke village.

I got the chance to meet some young people under the stairs of one youth's house; some were about 30 years old while others were just over 20. There were seven altogether and most were married. One youth was very active in social affairs. He had lived in the village since childhood. He explained about his experience on sea erosion and his perception on villagers' struggles. He led a group of youths to help village affairs, especially to welcome and host NGOs, government organizations and other social associations when they came to donate something to the village; they were known as the Social Welfare Association. I chose him as another key informant. This group did not exist before the 2015 erosion. There were five members of the group and they were all about 25

3. *Thanakha* is a white powder applied by women to their faces, giving an agreeably cool and fragrant sensation.

years old; each member paid 5,000 kyat for membership and all but one were married. The members have sacrificed to unite and develop the community. When donors informed the village headman that they wanted to offer support, he informed the Social Welfare Association to plan the welcome. Due to the number of supporters, the victims are comfortable in the short term. One of the local groups helped them to build some new tanks for drinking water. The group members distributed commodities to each household equally. Regarding sharing support, a 22-year-old member said:

> Some house-owners built a house but they don't live here because they work in the town. But we gave them their quotas because they give free labor to the village. Their share is maintained by the Group pending their return.

Regarding sharing among victims, for example rice and noodles, only the Social Welfare Association shared equally to all.

Regarding the allocation of land for houses, I asked the village headman how this was arranged. He explained that the Land Management Group was responsible.

Due to my close relationships with the villagers, on my second field trip I could discuss the condition of the village with the headman. He told me of his difficulties in finding money for the land in the new village. I thought he hoped that I could solve this problem and I said I would help as much as I could.

While I was in the village I met one woman in her house. When I asked about village history she suggested I should ask her father who had moved to the village in her grandfather's time. Later, her father became a key informant. He was about 75 years-old and had owned farmlands in the past. Now he did not work except in village affairs - he is one of the five village elders in the Land Management Group. He was very kind and wanted to tell me his life story. I knew him and his family members from my first field trip. He always helped the village monastery for example by going around the village to get alms-food with monks, helping in the village monastery donations, and in other ways. It was he who

helped the school children get to school by rowing the boat. His wife went regularly to the village monastery and cooked alms-food for the presiding monk.

From the above, I understood that Shwetasoke villagers loved their home village and gave their free time to help village affairs voluntarily. I usually contacted my key informants two or three times per week whenever I wanted to get new information. I understood why villagers did not move to the town. When I phoned my key informants I heard repeatedly about their troubles in the village whenever the sea level was rising around full moon. I felt their life as my life; I felt the Shwetasoke villagers as my relatives; and I decided to help them as much as I could.

During my two visits to the village, I ate rice and beans like them although the house-owner killed and cooked chicken for me; I slept on bamboo floors; and they understood my mind. Likewise, I also knew their daily struggle and I was in close relationship with many villagers; the headman, heads of households, the group of village leaders, grandfathers, grandmothers, household heads, housewives, and youths.

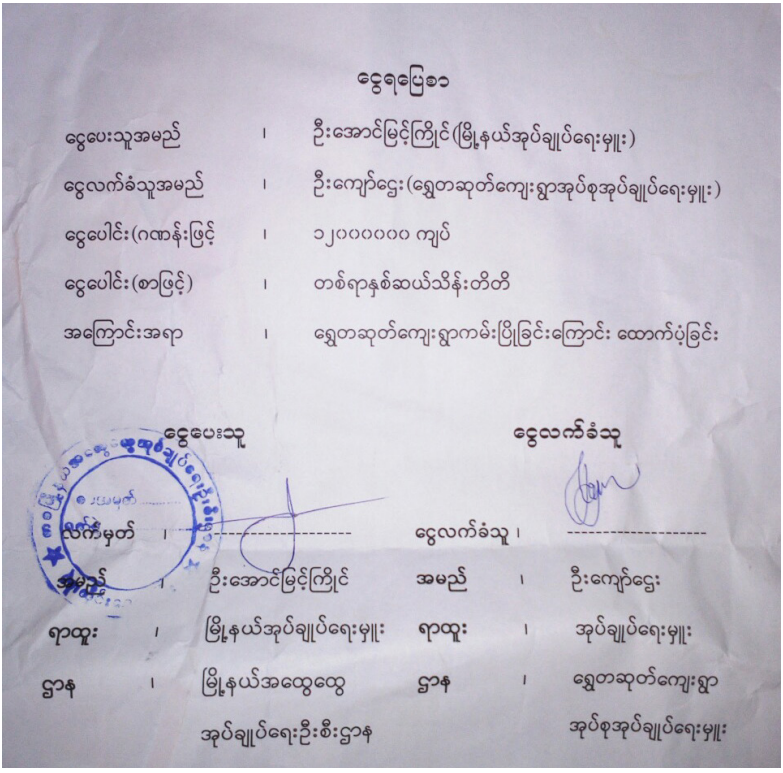
My home town is Bago but when I told my colleagues about Shwetasoke village, I said "my village" instead of "Shwetasoke village" because I looked on Shwetasoke village as if it were my home town.

When I came back, I thought I had a responsibility to do something to help with the urgent needs of the village. I sent a report which focused on the conditions of the village to the minister for the Bago Region before he visited Shwetasoke village in 2015. However, this was not successful as the report only reached the minister's assistant. I tried a second approach by informing the Anthropological Association of Myanmar about the situation of the village.

I wrote an article about Shwetasoke village river erosion in the government newspaper, hoping to find donors. The article was published on 17 July, 2016. I also sent some photographs of the sea erosion as it happened to Skynet media with a commentary. While I was in Mandalay I phoned my key informants about government

and non-government support. Though I did not get any support through my efforts, almost all the villagers understood that I was trying for them and gradually we established close relationships and they explained their difficulties.

While I arrived at the village in March 2017 they planned to move to the second new place because of gradually increasing erosion. I explained the real condition of the village to the administrator of Bago and his group; and in April 2017, at the start of the new budget year, the government offered 12,000,000 kyat (about $9000) to Shwetasoke villagers for the new land (see figure 28).


ငွေရပြေစာ

ငွေပေးသူအမည် ။ ဦးအောင်မြင့်ကြိုင် (မြို့နယ်အုပ်ချုပ်ရေးမှူး)

ငွေလက်ခံသူအမည် ။ ဦးကျော်ဌေး (ရွှေတဆုတ်ကျေးရွာအုပ်စုအုပ်ချုပ်ရေးမှူး)

ငွေပေါင်း (ဂဏန်းဖြင့် ။ ၁၂၀၀၀၀၀၀ ကျပ်

ငွေပေါင်း (စာဖြင့်) ။ တစ်ရာနှစ်ဆယ်သိန်းတိတိ

အကြောင်းအရာ ။ ရွှေတဆုတ်ကျေးရွာကမ်းပြိုခြင်းကြောင့် ထောက်ပံ့ခြင်း

ငွေပေးသူ

လက်မှတ် ။ ----------

အမည် ။ ဦးအောင်မြင့်ကြိုင်

ရာထူး ။ မြို့နယ်အုပ်ချုပ်ရေးမှူး

ဌာန ။ မြို့နယ်အထွေထွေ အုပ်ချုပ်ရေးဦးစီးဌာန

ငွေလက်ခံသူ

ငွေလက်ခံသူ ။ ----------

အမည် ။ ဦးကျော်ဌေး

ရာထူး ။ အုပ်ချုပ်ရေးမှူး

ဌာန ။ ရွှေတဆုတ်ကျေးရွာ အုပ်စုအုပ်ချုပ်ရေးမှူး

Figure 28: Receipt of budget from the government

5

DISCUSSION AND CONCLUSION

Discussion

This paper finds that erosion by sea on the Sittaung Riverbank impacts on people's socio-economic conditions especially through loss of land, occupation, and the infrastructure of the area. The findings are not all consistent with research conducted in Bangladesh (Paul & Routtray, 2010) showing that flood problems were linked to issues of demography, ecology, education, settlement pattern, society, socio-economic status, culture and politics; nor in the study of Muzarabani, Zimbabwe (Mavhura el al. (2017)) which focuses on social vulnerability. In Shwetasoke village most people are manual laborers without much education, and there is not much in the way of social class distinction—just between land-owners and the landless. The house designs of both groups are similar, and they respond collectively to the devastation.

It is evident that in response to erosion, Shwetasoke villagers adopt only locally known strategies and their responses do not differ from one household to another. However, their coping systems are different from those in other parts of the world such as Bangladesh and Zimbabwe, due to different environmental conditions.

Mavhura et al. (2013) found in their study that a high household income level is accompanied by increased access to food and safe drinking water, leading to a greater ability to cope with a disaster without turning to cheap food or selling assets. Likewise, among

Shwetasoke villagers land-owners have more income than manual laborers and they can invest that money in another business or buy land in the town.

Mavhura et al. (2013) argued that external supports and assistance from for example NGOs and the government are vital in determining the effectiveness of coping strategies. And Paul and Routray also recommended that it is vital to ensure assistance from government and NGOs during and after a flood to minimize the hardships that confront victims, and to help them regain their pre-disaster status and move forward. Similarly, in this study Shwetasoke villagers got a lot of support from different associations. The manual laborers need a regular income both for every day subsistence and to save for the future, but when external support comes to an end they face challenges; some left the village, in some cases emigrating to foreign countries.

Finally, this study shows that although sea erosion in Shwetasoke village generates socioeconomic environmental and infrastructural damage, villagers' responses can significantly mitigate their vulnerability to disaster. However, their adaptive strategies such as embankment building appear to be short-term measures which are not sustainable. Eventually the villagers had to move twice to new sites. Therefore, the government needs to implement sustainable development plans in disaster areas.

Conclusion

The Shwetasoke villagers suffered tidal wave erosion three times: in 1974, 1994 and 2015. The 2015 erosion swept away the village which collapsed into the Sittaung River in May 2016. All the inhabitants faced difficulties of water, land for farms and houses, and schooling. Land-owners changed their livelihoods, for example to shop-keeping or animal husbandry. Manual laborers could still get daily wages.

Before 2015, they sometimes recited Buddha teachings and during the 2015 erosion they built a pagoda to try to prevent the sea erosion. Unfortunately, none of this worked. To stop the sea erosion in the new village, the monks still recite the Patthan every week.

In the 2015 erosion manual laborers and the landless were more vulnerable than land-owners, because they depend solely on male labor while the housewives take care of the family. But the men cannot work for daily wages in the village because the farmland has gone. The village has moved twice to new sites, but the expense of moving is too much for some people.

Though land-owners lost their farmlands, they have other capital such as a house in Bago, and money. They can change their livelihood, for example to breeding ducks, pigs, or chickens, or renting land to continue farming. Nowadays, if they have surplus money they can go to Thailand to work in factories. But the landless can only do their daily work such as digging the land and carpentry; they do not have surplus money.

Though they go outside for livelihoods they want the sea erosion to stop in the Sittaung Riverbanks so they can return to their old village. And now they are continuously making merit every week by reciting the Pathtan with the monks from the village monastery.

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About the Author

Dr. Zin Mar Latt received her M.A (Anthropology) in 1998, beginning her career in academia at the Department of Anthropology, University of Yangon. She completed her PhD at the same university in 2013, with her thesis research centering on conceptions of ethnic identity, with a case study of Mon people living in Hinthargone ward, Bago Township, Myanmar. In 2015, she became an Associate Professor at the University of Mandalay.

In the years since she has participated in collaborative research with Florence University in the "Sustainable Destination Plan for the Ancient Cities of Upper Myanmar" project, and has conducted the "Humanities across Borders" program, coordinated by the International Institute for Asian Studies (IIAS) with the support of the Andrew W. Mellon Foundation and partner institutes, where she has focused on combining classroom lectures with student-led field work.

After her research in the UMD project, Dr. Zin Mar Latt has continued to collaborate with RCSD at Chiang Mai University under the support of IDRC. This ongoing project is further enhancing her research and teaching capacity, while she also supports the project in helping mentor her colleagues in qualitative research approaches. As a research fellow she is studying the living image at the Mahamuni compound in Mandalay, and she has more broadly forged an interest Popular Buddhism and the impact of urban development and tourism. In 2018, she transferred to Yadanabon University as a Professor.

EROSION AND COMMUNITY RESILIENCE:

Case Study of Shwetasoke Village, Kawa Township, Bago Region

With this research report, Dr. Zin Mar Latt has taken a deep dive into the life of rural Myanmar and the heavy challenges people there face from not just environmental and natural disasters, but also the human-made responses and adaptations to them. The political and economic transformations accelerating across Myanmar have led to a vastly changed social landscape. In this new context, villagers in this area—which has experienced several flooding and erosion events in the last 50 years—now have to adapt a new set of tools to negotiate their livelihoods.

As more frequent and extensive erosion and flooding becomes the norm, Shwetasoke locals have relied on not only traditional methods—familial and community networks, changing agricultural practices and religious space, as well as ritual cermonies—but have also put to work new tools of an independent press, social media and advocacy campaigns, and even engaging the researcher Zin Mar Latt herself as advocate-scholar to promote their agenda to academic and political actors at the regional and national levels.

As climate change looms in the near future as activator and multiplier of the intensity of these kinds of natural disasters, Dr. Zin Mar Latt's research stands as a critical case study of how communities exercise resilience to cope with drastic change and to maintain traditional ways of life, and also where they may be required to make serious adjustments, if not wholesale changes. Voices like this from the grassroots level will be crucial to fully seeing and understanding the extent and depth of rural transformation throughout Myanmar for policy-makers, aid agencies, and other communities that face a similar set of challenges moving into the future.

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