Environmental, Economic, Social and Health Impacts from the Flood Situation in Kham Riang Sub-district, Kantharawichai District, Maha Sarakham Province, Thailand in 2022

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Abstracts: The purpose of this research was to study the environmental, economic, social and health impacts of the flood situation in Kham Riang sub-district, Kantharawichai district, Maha Sarakham province. The sample used in the study were 140 villagers, 10 villagers per village, 14 villages of affected by environmental, economic, social and health impacts of the flood situation in Kham Riang sub-district, Kantharawichai district, Maha Sarakham province, from purposive sampling. The tools used in the study were: 1) interview form for the impact of the flood situation, 2) questionnaire on the impact of the flood situation. Qualitative data were analyed as descriptive. The results of the study showed that :1) Environmental impact from the flood situation, it was found that most of them were damaged in agriculture, for example, the flooding of rice fields and vegetable gardens, resulting in the lack of agricultural products for villagers and lack of income from agriculture. 2) The economic impact from the flood situation was found to affect agricultural crops and made the villagers lose income from their work due to inability to travel to work. And after the flood disaster disappeared must borrow debt borrowing money to repair the house which such villagers has been doing agriculture for the most part by damage to the plantation will fall at 1,750 baht per rai. There were some families relying on agriculture as their main occupation, the next occupation is trading. There are no products to be sold and do not have money to go buy things to resell. 3) Social impact from the flood situation, it was found that most of them were damaged in housing such as doors, windows, home appliances that were broken. The road has been damaged by water erosion, making traffic difficult for a long time, having to use a boat instead of a car to travel. Agricultural crops are damaged, especially the rice fields that were mostly damaged.4) Health impact from the flood situation, it was found that most of them had water allergies, such as biting feet. The cause of water bites is caused by irritation of the skin. Due to wetness and exposure to dirt, various chemicals in flooded areas can cause eczema. The skin looks peeling, especially at the niche of the toes which has a red rash, burning, itching, including causing stress and anxiety in the lives of the villagers in everyday life.

Keywords: Flood, Impacts, Environmental, Economic, Social, Health

1. INTRODUCTION

A flood is a flood that occurs from a large amount of accumulated water that flows in a horizontal plane from high

to low, infiltrating houses. The farm was damaged, or it is in a flooded condition. In large metropolitan areas caused by continuous heavy rain for a long time, it is caused by the drainage system and is not good enough. There is a building blocking the drainage, and rising water levels have resulted in a change in the environment. These changes can be very damaging. Whether it's a health problem Increased water levels tend to wash away dirt and germs from different places. This may result in the breeding of disease-carrying insects, bacteria and viruses. In addition, the rising water level has resulted in poisonous animals migrating from the water to living in human habitations. These changes can result in health problems often associated with infections, such as food poisoning, leptospirosis and dengue fever including increasing the risk of injury from poisonous animal bites and other accidents to the point of causing the death of the public. In addition, difficult transportation causes an accident to occur causing economic, social and environmental damage. People who live in flooded areas, have their property damaged. At the same time, they also had to move to find other shelters [1].

Environmental impact danger and damage to life, property, buildings, and houses directly flood in the city, and factories, warehouses, warehouses, houses are not strong. These may be destroyed by the turbulent current or the waves can wash down to the sea. People, vehicles, pets may drown or be swept away by the turbulent currents. Transportation routes were cut off, including roads and railways that were damaged in general. Vehicles that can't run for deliveries cause damage and disruption to the economy, public utilities will be damaged, such as the telephone telegraph business, electricity, water supply and drainage system, etc., airports, parks, schools damage to public buildings such as airport terminals, parks, schools, temples, architecture and fine arts. It is damage to agricultural sites, including farmland, pets, animals and vehicles, as well as grain storage [2].

The economic impact of flooding is a natural disaster as the amount of precipitation fluctuates in many areas, resulting in a balance. The water tends to decrease while the supply of fresh water for consumption decreases. Temperature changes are likely to reduce important agricultural products in Thailand. It affects the general price level of goods, which is an indicator of economic stability. This shows that climate change disasters are a factor in increasing the severity of flooding in many areas affecting the security of consumers and people [3].

The impact of flood disasters affects society in terms of land use conversion from natural conditions to construction areas, increasing the risk of flooding. due to the amount of surface water runoff increased. Even though the change in land use in urban areas will include planting areas for trees and lawns. However, its ability to absorb water is still very different from that of natural forests and grasslands. This is because trees planted in urban areas tend to have a slower growth rate and a shorter lifespan than perennials in natural conditions built on hardscapes that cannot seep into the soil, or the seepage of underground water in the vicinity of the construction site is often reduced as well. Because the soil will hold together more tightly. It may be the effect of the construction site on the seepage of water to the ground. However, the thing to be aware of is that conserving nature may help mitigate the severity of flooding. However, the conservation of nature alone may not prevent all flooding. The flood problem is related to other factors, many more especially if there are structures that block the natural flow of water, both from the construction of infrastructure such as roads, bridges, dams and various drainage systems including the development of large areas such as public utility projects, industrial estate and large residential projects [4].

The most serious health effects are death caused by drowning electric shock and stress suicide during flooding victims. It may be found with injuries such as abrasions, lacerations, sprains, sprains, broken limbs. Which occurred during the transfer of assets fleeing water poisonous animals such as snakes, centipedes, may cause harm to the victims. Improper hygiene care leads to problems with infectious and contagious diseases such as food poisoning, infected diarrhea, leptospirosis, etc. And if the prevention is not properly taken care of, it may also cause an epidemic. During the flood, vulnerable groups of people or those with low self-care ability, such as children, the elderly, chronic disease patients, and the disabled, are more likely to be affected by the flood than other people in the community who can lead normal lives. It is becoming more and more difficult to provide food that is suitable for age and underlying disease. The disadvantages of transportation during the flood also affected the healthcare system. People have difficulty accessing medical and nursing care and treatment. Patients with chronic diseases must miss medication and are not continually being treated, complications may follow [5].

In September 2022, the Noru storm passed Maha Sarakham province, raining all day, causing the water situation in the Chi River to be affected by heavy rains in Khon Kaen province which the mass of water flows along the Chi River to Maha Sarakham province together with the drainage of the Ubolratana Dam with full water capacity. There is an announcement to increase the ventilation causing the two water masses to connect before entering Maha Sarakham province consequently, the basin along the Chi River. Due to continuous heavy rain in the area. There is a lot of water in the Chi River, causing delays in the drainage into the Chi River in Kantharawichai district. which such disasters are public disasters or emergency disasters causing damage to property, homes, agricultural areas, fisheries, livestock and public benefits, especially in the area of Kwai Yai sub-district, Kham Riang sub-district, Tha Khon Yang sub-district, Makha sub-district, Kham Thao Phatthana sub-district, Kut Sai Cho Sub-district and Na Si Nuan Sub-district, Kantharawichai District, Maha Sarakham province.

Therefore, the researchers are interested in studying the environmental, economic, social and health impacts of the flood situation in Kham Riang sub-district, Kantharawichai district, Maha Sarakham province to be a way to prevent and solve flood problems with better efficiency.

2. RESEARCH PURPOSE

To study impacts of the environmental, economic, social and health from the flood situation in Kham Riang sub-district, Kantharawichai district, Maha Sarakham province.

3. METHOD

3.1 Conceptual Framework for Research

A study of environmental, economic, social and health impacts the flood situation in Kham Riang sub-district, Kantharawichai district, Maha Sarakham province, we purpose context in Kham Riang area information on environmental, economic, social and health impacts from the flood situation in Kham Riang sub-district, Kantharawichai district, Maha Sarakham province namely; environmental, economic, social and health impacts from

the flood situation in Kham Riang sub-district area Kantharawichai district, Maha Sarakham Province as illustrated in figure 1.

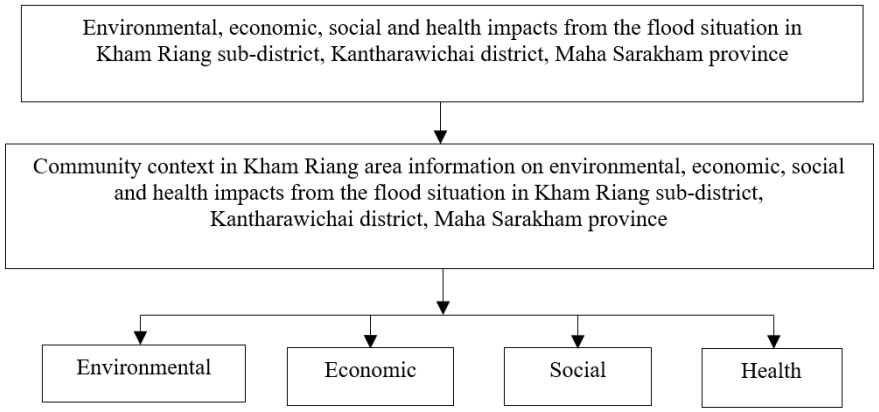

Figure 1. Conceptual framework used in research.

3.2 Study Area

The study area is the area in Kham Riang sub-district, Kantharawichai district, Maha Sarakham province.

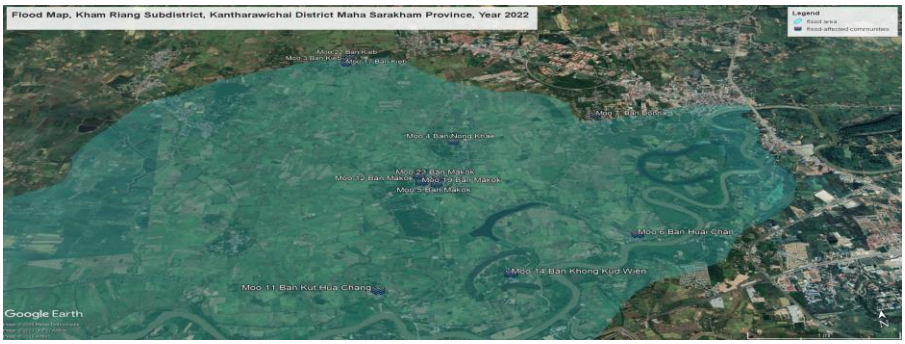

Figure 2. Map of the flooded area of Kham Riang sub-district, Kantharawichai district, Maha Sarakham province

3.3 POPULATION AND SAMPLE

There were 140 people being affected by the environmental, economic, social and health impacts from the flood situation in Kham Riang sub-district, Kantharawichai district, Maha Sarakham province, representatives of 10 villages, 14 villages; Ban Khieb, Ban Nong Khae, Ban Makok, Ban Huai Chan, Ban Donna, Ban Kut Hua Chang, Ban Makok, Ban Khong Kut Wien, Ban Khieb, Ban Makok, Ban Makok, Ban Nong Khae, Ban Khieb and Ban Makok.

3.4 THE RESEARCH TOOLS AND QUALITY OF TOOLS

The research tools were structured interview form and questionnaire about environmental, economic, social and

health impacts from the flood situation in Kham Riang sub-district, Kantharawichai district, Maha Sarakham province.

1) Study the basic information about the impact of the flood situation in Kham Riang sub-district, Kantharawichai district, Maha Sarakham province. The in-depth information consists of community leaders, sub-district headmen, village headmen, assistant village headmen, and village health volunteers, who have knowledge about people affected by the environmental, economic, social and health impacts of the flood situation.

2) Create a structured interview form which is an open-ended interview with issues concerning the impact of the flood situation in Kham Riang sub-district, Kantharawichai district, Maha Sarakham province.

3) Create a structured questionnaire. Each question has an answer on a rating scale consisting of environmental impacts, economic impacts social impacts and health effects. The criteria for responding to the questionnaire were 3 levels: high, moderate, and low.

4) Bring the generated interview form to verify the accuracy and suitability.

5) Bring the interview form and revise it according to the advice of experts in order to collect data with the sample group.

3.5 STUDY AREA SELECTION CRITERIA

Criteria for selecting types of people affected by environmental, economic, social and health effects from the flood situation are divided into 2 categories: areas that are highly affected and less affected areas with the following criteria:

1) The criterion for selecting the most affected area is the long-term affected area suffering from both physical and mental health, mental health, and property.

2) The criterion for selecting the least affected area is an area that is affected in the short term, not high flood suffering from both physical and mental health and less.

3.6 CRITRRIA FOR SELECTING INTERVIEWEES

Community leaders choosing a community leader, the researcher selected those who are leaders by position and those who have status or are accepted by the community as leaders, village headmen, village headmen, village headmen's assistants, village volunteers, etc. Who have knowledge about people affected by environmental, economic, social and health effects from the flood situation in Kham Riang sub-district, Kantharawichai district, Maha Sarakham province.

3.7 DATA COLLECTION

To study the environmental, economic, social and health impacts from the flood situation in Kham Riang

Sub-district, Kantharawichai district, Maha Sarakham province.

1) The study of secondary data is the study of information from documents, books, textbooks, journals and related research on environmental, economic, social and health impacts.

2) Survey and study the area, population and sample group, Kham Riang sub-district Kantharawichai district, Maha Sarakham province.

3) Visit 140 people in the area to collect in-depth information about environmental, economic, social and health impacts from the flood situation in Kham Riang sub-district, Kantharawichai district, Maha Sarakham province, along with recording data, sound recording, and taking pictures for the operation.

4. RESULTS

The research results can be summarized as follows:

4.1 Environmental impacts from flood situations

The results of the study of environmental impact of the flood situation with an average of 2.93, at a high level, it was found that Kham Riang sub-district, Kantharawichai district, Maha Sarakham province. Most of them were damaged in agriculture, such as flooding in rice paddy fields and vegetable gardens, causing villagers to have no agricultural products and lack income from agriculture. Following the damage to houses, it was found that most villages were flooded in low-lying areas. Due to the large amount of water flowing from the Chi River, it overflows from the barrier or the water flap into the surrounding villages. In some villages, there is a waterproof flap between the entrance to the village of Donna. This water barrier prevents water from entering in large quantities. The water will flow down through Huai Chan Village, Village Moo 6 and Ban Makok, Village Moo 5, 12, 18, 19, 23.

4.2 Economic impact of the flood situation

The results of the study of the economic impact of the flood situation with an average of 2.50, at a high level, it was found that Kham Riang sub-district, Kantharawichai district, Maha Sarakham province as a result, villagers have higher living expenses. But impacts for agricultural crops and made the villagers lose income from their work. Due to the inability to travel to work and after the flood disaster disappeared must borrow debt borrowing property to repair the house. Most of them are affected by the economy, which is agriculture, which the villagers said. It has been doing agriculture for the most part by damage to the plantation will fall at 1,750 baht/rai. There are some families relying on agriculture as their main occupation, followed by a trading career, this occupation has been damaged, such as spoiled goods, damaged products, causing merchants. There are no products for sale and do not have money to buy things to resell.

4.3 Social Impacts of The Flood Situation

The results of the study of social impacts from the flood situation the mean were 2.74 at a high level Kantharawichai district, Maha Sarakham province. Most of them are damaged in housing such as doors, windows, and home appliances. Roads are damaged by water erosion making traffic difficult for a long time, having to use a boat instead of using a car to travel. Agricultural crops are damaged especially the rice fields that were mostly damaged.

4.4 Health Impacts from The Flood Situation

The results of the study of health impacts from the flood situation with an average of 2.67, at a high level, it was found that Kham Riang Sub-district, Kantharawichai district, Maha Sarakham province. Most of them have water allergies, such as water bites on their feet. The cause of water bites is irritation of the skin due to wetness and contact with dirt. The chemicals in the water add up to cause eczema. The skin looks peeling especially at the niche of the toes, there is also a red rash that burns and itches causing stress and anxiety in the lives of the villagers in everyday life.

Table 1. Mean value and standard deviation of the impact of the flood situation. (n=140)

Environmental, economic, social and health impacts from the flood situation	$\bar{x}$	**S.D.**	**Impact level**
Environmental impacts from the flood situation	2.93	0.22	high
Economic impacts from the flood situation	2.50	0.27	high
Social impacts from the flood situation	2.74	0.48	high
Health impacts from the flood situation	2.67	0.50	high
Overall	**2.71**	**0.28**	**high**

5. DISCUSSION

5.1 Environmental Impacts from Flood Situations

The study of environmental impacts from the flood situation, it was found that Kham Riang Sub-district, Kantharawichai district, Maha Sarakham province. Most of them were damaged in agriculture, such as flooding in rice paddy fields and vegetable gardens, causing villagers to have no agricultural products and lack of income from agriculture damage to houses. The environmental impact of this flood situation is a danger and danger caused by flash flooding conditions. Which is caused by water in Chaiyaphum province, heavy rain, and continuous rain for a long time. It was also affected by the Ubolratana Dam, Chulabhorn Dam which releases water. And Chi River overflowing the sandbag flap that the villagers blocked at Ban Kut Hua Chang. The entire mass of water has flowed into thousands of rais of farmer's fields. This is consistent with the concept of Na Chiang Mai, N. [6] said that environmental impact refers to new things or new combinations of the environment, either man-made or that may occur naturally resulting in the original environment or other environments being affected and until affecting the

change in any way. There may be chemical, physical, or biological changes that could have a detrimental effect on the quality of life and the environment. This is consistent with the concept of Office of Natural Resources and Environmental Policy and Planning [7] said as a consequence or arising from events that happen to the land, water, air, forests, animals, plants, various natural resources, and what humans do in that environment. Which has both positive and negative effects on the environment both in the short term and in the long term. It may cause changes to the livelihood of humans and animals that live in that system. This is consistent with the concept of Sriburi, T. [8] said that environmental impact assessment (EIA) means the analysis of the impact of projects or activities that may occur on the environment or the environment that may affect the project or business both positively and negatively. Things that should be prepared and controlled to be corrected before deciding to implement a project, business, or that thing. This is consistent with the research of Tharasrisuthi, T. [9] has studied ways to solve economic impact problems in society and environment from tourism development: a case study of Tha Kha floating market community. The study found that tourism development has a medium impact on the overall picture with high positive economic and social impacts. But has a moderate negative environmental impact. This is consistent with the research of Phoochinda, W. & Tengsakul, D. [10] study initial assessment of the environmental impact of community resource management by using industrial ecology: a case study of Ban Khok Mai Ngam in Si Suk sub-district, Si Chom Phu district, Khon Kaen province. The results showed that three activities of five activities were in accordance with the industrial ecology concept which resulted in a reduction of their cost and CO_2 emission by an average of 22.50%. Respective factors for the achievement are the capability and performance of community leaders, community trust–worthiness of leadership, cultural and traditional conservation. Such factors could make a community development model for the sustainability of a community. This is consistent with the research of Sae-Tang, Y. [11] studied guidelines to establish environmental impact assessment standards for housing condominium projects in Bangkok. The results showed that regulatory requirements for EIA reporting for residential condominium projects in Bangkok have adverse effects on the environment. The sample group opined the requirements for controlling environmental impact assessment reports for residential condominium projects in Bangkok. It is not suitable, and some requirements should be added to create a standard for future use. This is consistent with the research of Hrdinka, T., Novický, O., Hanslík, E., & Rieder, M. [12] study possible impacts of floods and droughts on water quality. The results showed that this study presents that the particular flood event had a significantly greater impact on water quality than the period of drought even if for only a very short time. This is consistent with the research of P.K. Aggarwal, N. Kalra, S. Chander, H. Pathak. [13] study info crop: a dynamic simulation model for the assessment of crop yields, losses due to pests, and environmental impact of agro-ecosystems in tropical environments model description. The model considers the key processes related to crop growth, effects of water deficit, flooding, nitrogen management, temperature and frost stresses, crop–pest interactions, soil water and nitrogen balance, and (soil) organic carbon dynamics.

5.2 Economic Impact of The Flood Situation

The study of economic impact of the flood situation, it was found that Kham Riang Sub-district, Kantharawichai district, Maha Sarakham province affected by economic flooding in 14 villages. Most of them suffered economic losses, namely, many raises of agricultural crops were damaged, rice fields could not be harvested. Some

households must buy rice for their own consumption resulting in more expenses, the household had to purchase all new rice seeds for use in farming the next season. The problem of flooding there are two types of economic consequences, namely houses, shops, dormitories, entrepreneurs, lack of income, things that are purchased to be rotten, damaged materials and equipment, and residential homes. Some households have cement erosion and damaged water erosion making it necessary to repair the damaged house. This is consistent with the concept of National Statistical Office [14] said that economic impact means the monetary impact that occurs both directly and indirectly in the area which is a result of the operation of industrial estate activities, amplification through a multiplier working process. Narrow and broad economic circulation for the concept of the individual economy in terms of income. This is consistent with the research of Viriyathorn, S. & Kirdruang, P. [15] studied that vulnerability to disaster OD household: the case study from the 2011 flood in Thailand. The result showed that the resilience index had a greater effect on the loss of households than the others. For the provinces located in Chaopraya river area which suffered from the 2011 flood, the effect of the susceptibility index and resilience index on their economic loss and income loss were more than the total of household samples. In addition, the flood management and relief plan, flood forecasting and efficiency warnings from the public sector were vital for the protection of household vulnerability to disasters and reduce household loss. This is consistent with the research of Boonreang, E., et al. [16] studied community-based flood management of Warin Chamrap Town Municipality: a case study of fourteen communities affected by flood. The results show that the communities managed the flood through self-assistance before, during, and after the flood: for example, relocating assets, building temporary shelters, supplying boats, and general cleaning after the flood. The proposed community-based approach in flood management is that Warin Chamrap Town Municipality needs to take into consideration communities' needs and to assess its capacity in flood management. This would lead to efficient and responsive flood management. Which is consistent with the research of Deshmukh, A., Ho Oh, E. and Hastak, M. [17] studied impact of flood-damaged critical infrastructure on communities and industries. The results show that the serviceability of infrastructure plays an important role in post-disaster recovery and response. Reduction in the serviceability of an infrastructure also affects the functionality of the activities that depend on the affected infrastructure resulting in social and economic impact. This is consistent with the research of Agamuthu, P., Milow, P., Nurul, A. M. N.., Nurhawa, A. R., & Fauziah, S. H. [18] studied the impact of a flood on waste generation and composition in Kelantan. This study concluded that flood waste generated in Kelantan is highly heterogeneous in nature but predominantly construction and demolition waste, which carries significant economic value. This is consistent with the research of Bubeck, P., Otto, A., & Weichselgartner, J. [19] which studied the societal impacts of flood hazards. Floods remain the most devastating natural hazard globally, despite substantial investments in flood prevention and management in recent decades. Fluvial floods, such as the ones in Pakistan in 2010 and Thailand in 2011, can affect entire countries and cause severe economic and human losses.

5.3 Social Impacts of The Flood Situation

The study of social impacts from the flood situation, it was found that Kham Riang Sub-district, Kantharawichai district, Maha Sarakham province affected by the social flood situation in 9 villages. Most of them have been

damaged in housing, such as doors, windows, and home appliances. Roads are damaged by water erosion, making it difficult to travel around for a long time. And agricultural crops are damaged. This is consistent with the concept of Pongphaichit, P. [20] said that social impact assessment from the decision-making process of large-scale government development projects, and economic evaluation methods are used in the form of cost-benefit analysis or security in various areas. There is a lack of attention to the negative effects on society-culture of the project. It has a profound impact on the people. Whether it's about having to be relocated to the house, the place of work, having to change the way of life, or worsening quality of life. Even negative effects on mental health in various forms that the development project has created. This is consistent with the concept of Chankham, Ch. [21] proposed the idea that social impact studies should be separate from environmental impact studies because based on the environmental impact assessment process. It is a study that focuses on physical and biological problems. This is different from social impact assessments that focus on the value or quality of life or way of life that may have to change when implementing various projects. And to strengthen the decision-making process of the state to be more prudent and appropriate. This is consistent with the research of Pinsawasdi, Y. & Sinchai, T. [22] studied national disaster risk management in Chainat province. The results showed that analysis of risks from natural disasters found that natural disasters in Chainat province are floods and droughts caused by topography and climate. The geography is hilly and mountainous, and there are areas both in the irrigated and non-irrigated areas. Risk management includes disaster risk reduction. Emergency management and rehabilitation emergency management process in Chainat province. There is a process of organizing a rapid action team to provide initial assistance to flood victims. There is a place to evacuate the victims. There is preparation to provide consumer goods, food, drinking water, medicine and taking care of the health and well-being of the victims. In addition, a set of officials have been prepared together with local leaders, village headmen and village headmen to jointly perform their duties. This is consistent with the research of Khamnu, N. [23] studied the utilization of social capital in the development of the lower Chi River Basin network for dam impact mitigation. The results showed that the construction of the Roi-Et dam Yasothon-Phanom Phrai dam and That Noi dam. As a result, it affects the subsistence farming system and watershed ecosystems. This causes long-term flooding in agricultural areas and villagers' residences. Villagers experiencing such problems have organized a group to claim compensation for the loss of opportunity with the relevant agencies. Private developers working on the environment to support the development of a network of villagers in the lower Chi River Basin. To demand the right to manage community resources and compensation for the loss of farming opportunities. This is consistent with the research of Sresunt, S. [24] studied poor people in the flood disaster during CE 2011. The results showed that the poor are more affected by floods than other groups. At the same time, they received less help than other groups. This is consistent with the research of Reeve, D., & Badr, A. [25] studied the performance of sandbags for domestic flood defense. This paper presents the results of experimental research carried out to assess the performance of sandbags as domestic flood defense. The performance criteria included water leakage, structural integrity, ease of use and environmental impact. It is concluded that sandbags have only modest performance as a domestic flood defence. The results showed that leakage from sandbags increased rapidly with increase of the outside water level.

5.4 Health Impacts from The Flood Situation

The study of health impacts from the flood situation, it was found that Kham Riang Sub-district, Kantharawichai district, Maha Sarakham province most of them have water allergies, such as water bites on the feet. The cause of water bites is irritation of the skin due to wetness and contact with dirt. Various chemicals in the water can cause skin rashes. The skin appears to peel, especially between the toes. There may be a rash, burning with itching including causing stress and concerns in the lives of villagers in everyday life. This is consistent with the concept of Suwan, M. [26] said that the impact assessment must be assessed before the project implementation. During the project and after the project to know what is expected to happen accordingly. Which affects changes in every social system and there must be a health impact assessment as well. Because the impact that will occur must have an impact on the mind and health. Therefore, it should be evaluated in all aspects, because all aspects of the impact are linked and related. This is consistent with the concept of Senee, Ch., et al. [27] said that health impact assessment is an important tool for developing public health policies. Health impact assessment is not a decision-making process in and of itself. Rather, it is a process that provides evidence in the field of health and adds weight or importance to the health dimension in the decision-making process in public policy. A health impact assessment is an attempt to develop a set of recommendations or recommendations that contain corroborating information that reflects the approach. And the value or importance of the shared well-being of society. This is consistent with the research of Klaisuk, A., et al. [28] studied the association of knowledge, attitude, and flood preparedness behaviors among people in Patal Sub-district, Muang District, Lopburi Province. The results showed that the knowledge of health effects and management for reducing health effects was rather low. The flood preparedness behavior was found to be correlated with knowledge and attitude. Results suggested that knowledge should be provided by addressing health effects and management so that people have appropriate flood preparedness behavior. This is consistent with the research of Klaiket, W. [29] studied of health management community during floods in Phra Nak horn Si Ayutthaya province. The results showed that the major health problems were Athlete's foot, conjunctivitis, and dermatitis, respectively. The needs for health management during the flood were clean water, medicine for the Athlete's foot and conjunctivitis. This is consistent with the research of Siriprohmpathara, Ch., et al. [30] studied the impacts on health and health care after flooding in Banprakue, Pralub Sub-district, Muang District, Khon Kaen Province. The results showed that the affected samples have a congenital disease, namely hypertension and diabetes in the majority. As for the disease caused by the effects of the flood, there is only one disease Athlete's foot. For mental health impact, it was found that most of them had no problems. Only participants had serious mental problems regarding isolation, paranoia, eating troubles and sleeping problems. When having a disease or health problem, most samples would go to see health professionals and receive treatments at health promotion hospitals and other hospitals. The first three supports that samples needed were the investment, consumer goods and places to live respectively. This is consistent with the research of Charoensuk, Ch. & Nathapindhu, G. [31] studied the health impact of flooding and the adaptation of the people in the repetitively flooded area of the Kasetsomboon district, Chaiyaphum province. The results showed that the health of the population was affected in that 49.3% suffered from some sort of illness. Fungus infection of the feet was considered the most frequent one (94.7%); 12.1% suffered from cold; 6.1% were stressed, and 2.7% had an accident mainly because of a slippery surface (57.1%).

Figure 3. Picture of flood impact

Figure 4. Picture after the flood situation

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