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Effects of Pre-Disaster Management of Flood in Lam Ta Kong Basin on Communities' Ways of Life

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Abstract: This research was aimed at studying the effects of Lam Ta Kong basin's community-based pre-disaster management of flood on communities' ways of living. The quality research design was applied with the units of analysis comprising household and community. The data was collected from group interview and in-depth interview based on the interview structures with the target groups including the community elderly group, village sages, village heads, community committee, community organization leaders and villagers whom had undergone flood disaster, totaling 30 persons. The interviews were conducted from February thru November 2014 in the community experiencing at least three times of flood in 2007-2012. The results were analyzed and presented based on the descriptive analysis. The research findings indicated that the community located in a flood-risk area continuously faced flood disasters. Pre-disaster management performed in order to face the flood involved on 2 major processes: Flood Disaster Mitigation: the community modified their houses or built their houses based on the safety and security thinking. This resulted in a different house characteristic. Production was also adjusted by cultivating second paddy which affected labor management. Rice breeds were changed and as a consequence, indigenous rice breeds became less popular. Disaster Preparedness Management: the community sent out warnings and kept surveillance over flooding through their networks both inside and outside the community. This led to alertness of the people in receiving information from various sources, requiring planning, cooperation and working with other communities. Safe areas were planned and provided as temporary refuges.

Key words: Disaster management, pre-disaster management, communities' ways of life, flood, Lam Ta Kong Basin, rice

INTRODUCTION

"Disaster" is a phenomenon seen as the consequence of imbalanced development. When it occurs, the situation is usually violent and causes disasters to humans in huge circles, both socially and environmentally. Losses from disasters can be beyond social capabilities to manage (UNDHA, 1992). Thailand has high risk of disasters from floods that happen annually (Shook, 1997), especially in risk areas. People's housing close to mountains, rivers, waterways or lowland is specifically susceptible to floods (Bureau of Research Development and Hydrology, 2010). Every time flood happens, it covers a vast area with high population density affecting their ways of living and agricultural occupations.

According to the statistics of flood disaster in Thailand during 2002-2008, disaster intensity was increasing and caused more damage cost. Flood disaster occurred 6 times in 2002. The flood affected to 65 provinces around Thailand and the damage cost was up to 7,601.79 Million Baht (DDPM, 2010). Government had to generate large amount of the federal budget to support the victims (DDPM, 2008). In addition, flood disaster caused the damage on risk area where most of the area was rural area with agriculture activity. According to statistics in 2010, agriculture area where got the damage from flood disaster was totally 5,786,655.47 acres (Office of Natural Disaster and Agricultural Risk Protection, 2010). In Thailand, disaster management plan was conducted as the post-disaster management by focusing on the aid and rehabilitation of disaster victims. However, there was still no government units that took responsible for disaster protection and risk reduction plans. The unclear of responsible government units also caused an ineffective of disaster management. Especially

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in the risk area, it was found that the area had to deal with flood disaster many times repeatedly without good management plan. This reflected that there was no any management plans or management plan in local area was still ineffective.

According to the ranking of domestic repetitive flooding area, found that area 38,299,072.88 acres in the Northeastern region affected the repetitive flooding since, the soil condition in Northeastern region could not absorb much rainfall and less forest occupied flooding due to forest deterioration. In addition, geographical context in the region was surrounded by the ranges. The rain then fall down to lower plain and resulted in the flood disaster especially in rainy season (Department of Lands, 2004).

According to the ranking of repetitive flooding area in Northeastern region, found that Nakorn Ratchasima Province had the most repetitive flooding area where was 335,633.60 acres (Department of Lands, 2004). Soil in Nakorn Ratchasima was the alkaline soil condition which caused the plants death or not fully growth (Institute of Engineering, 2007). Thus, there was no plants covered land surface and might be at risk on flood disaster. In addition, rainfall in each year was high variability or uncertainty, so it was unpredictable about rainfall in each year. According to Statistics of flood disaster in Nakorn Ratchasima province during 2007-2012, found that the flood disaster was increasing and had more damage to risk area. In 2010, flood disaster occurred 3 times covered almost 100% of provincial area. Government had to allocated the federal budget to support flood victims about 180,000,000 million Baht. In addition, Nakorn Ratchasima now is still dealing with the repetitive flooding and the problem has not yet solved especially in community around the Lam Ta Kong basin.

Lam Ta Kong basin is situated in the lower Northeastern area covering 7 districts, 60 sub-districts and 579 villages. Runoff from the basin changed with the season. During heavy rain periods, runoff amount is high bringing flood over both banks of the river. Lam Ta Kong communities have faced floods before 1958 until now affecting the paddy fields. However, the communities still live there and did not move away. It is believed, on part of the researchers that the communities were capable to manage the floods.

Questions thus arose of how the people who repeatedly faced the floods managed pre-flood disasters so that the communities received the least impact and how their management affected the ways of living. The study would lead to new bodies of knowledge of pre-flood management in flood-risk areas which would benefit community and governmental unit levels in setting appropriate policies to support the people.

Literature review and conceptual framework: The concept of disaster management does not see severity causing disasters as a socially external phenomenon but an internal phenomenon connected with individuals' decision to settle and develop the place (Smith, 2004). Occurrence of disasters to several community internal aspects led to consideration to mitigate risks and hence reduce losses that happen to people. Disasters can be classified into 3 types, the natural disaster, the man-made disaster and the complex disaster. These are caused by actions of man with social or political expectations (CBSE, 2006; Keeney, 2004). This study emphasized flood which is categorized as the natural disaster that takes place every year in Thailand with a very high risk level.

Mitigation of violence from impact when there is missing of preparedness led to limitations in response to the natural disaster (Pearce, 2003). Efficient response to disasters requires management of preparedness to mitigate impact. At present, disaster management is related to activities under the Hyogo Framework of Action, a ten-year program from 2005-2015. The United Nations Organization requires member countries to cooperate and accept regulations when adopting the approaches to manage their own disasters. The approaches include risk assessment, disaster prevention and preparation, development and strength of preventive potentiality, disaster impact mitigation, warning systems, distribution of information, participation of all levels from community to national governments, regions and international levels, reduction of vulnerability and environmental protection which are important factors in preparation for disasters (UNISDR, 2005).

Pre-disaster management is preparation prior to the disaster. Activities include reduction of impact from the disaster and preparation to accommodate the disaster (Coppola, 2007) with details as follows:

- Disaster mitigation reduces severity of impacts or risks. It is an important element of disaster management. Strategies for impact mitigation can be divided into two categories, the structural strategy and non-structural strategy. The first includes strong construction, resettlement, building refuges, building of codes and monitoring measures, etc. The second includes building of awareness of disasters, education, control and maintenance of the environment and alteration of behaviors
- Disaster preparedness involves preparation for disasters and builds up capacities to lessen impact and capabilities of restoration work. The preparation work includes planning, training, preparation of equipment and education, etc.

This study aimed at explaining pre-disaster management implemented by communities around Lam Ta Kong basin to mitigate violence and prepare for disaster counteraction. The term pre-disaster management means communities' two dimensions of actions to reduce loss from floods, namely: mitigation of violence of impacts from floods and preparation to counteract when floods occur. It is believed that such community-based preparation will lead to alterations of communities' ways of life so that impacts from disasters can be reduced.

MATERIALS AND METHODS

This study used the qualitative research method to understand the pre-disaster management phenomena in the community with socially-contextual dynamics. The emphasis was placed on the social phenomena occurring due to phenomenological assumptions (Creswell, 2008) to obtain in-depth data. The analytical units were at household and community levels.

Regarding on research area selection, selected area was considered by steps as per details; the 1st step, basin selection, during the area surveying, it was found that there were 14 basins in Nakorn Ratchasima. Criteria of selection were designed to find out an outstanding area. The criteria were: the area would be a major basin of the province, the basin would have the most damage cost. The study finally selected the Lam Ta Kong basin as the research area because the Lam Ta Kong basin covered 7 districts and had the largest watershed area of the province that was 3,518 m^2. In addition, 54,502 households and 128,102.83 acres of agricultural area around the Lam Ta Kong basin got effects on flood disaster and the damage cost was 92,921,612 Baht.

The 2nd step is area selection, in the Lam Ta Kong basin, criteria of selection were: vulnerability of geographical context, flood risk possibility, the repetitive flood area and damage cost. It was found that the basin area around Si Kiew District, Soong Nuen District, Kham Talaysor District and Meung District was suitable to conduct research because the area got effects from the flood disaster 5 times during in 2007-2012. The flood caused negative effects to 50,973 households and 124,821.46 acres of agricultural area. Damage cost in this area was 72,233,649 Baht.

The 3rd step is community selection, the chosen community would be based on criteria which were: community settled in the center of Lam Ta Kong basin, community settled in the repetitive flooding area (average 3-5 times in 5 years) and community has ever experienced in the pre-disaster management before. Regarding on community criteria, "Klong Say village" in Kham Talaysor district was selected as research area.

The data was collected from 30 key informants, separated into 2 groups which consisted of: seniors, community leaders, leaders community and leaders of local organizations who were totally 15 persons. These informants were persons who have lived in community at least 25 years and well known on community contexts, disaster history in community and pre-disaster management in community and key informants who provided information about disaster in community included community leaders, leaders of local organizations that related to water resource management and villagers who got effect from flooding, totally 15 persons. These persons were interviewed to find out the pre-disaster management by community by focusing on the disaster mitigation and the disaster preparedness.

Data collection was conducted from February until November 2014 through in-depth interview based on the interview guideline (Podhisita, 2006). Interviewees comprised village head, committee members and villagers undergoing floods to collect data on pre-flood management. The group interview technique was used with the community elderly, village sages and organization leaders for contextual information on physical, economic, social and cultural aspects together with the flood occurrence and preliminary pre-disaster management. Non-participant observation was conducted on the physical conditions, housing, lifestyles, field crop and orchard cultivation around the area to obtain data concerning areal conditions for cropping, types of crops, people's behaviors and practices, water resources, direction of flow. Participation observation was conducted through attendance in the sub-district community meeting and the meeting on water management of Lam Ta Kong Basin Communities. Observation was made on relationships in the community on the children's day. The data was analyzed using the content analysis approach.

RESULTS AND DISCUSSION

The results of the pre-flood management of a Lam Ta Kong basin community that affected their ways of living are presented in 3 topics: the flood-risk community context, the community's flood experiences and the community's pre-flood management affecting ways of life.

The flood-risk community context: Ban Khlongsai village is situated in the Southern part of Lam Ta Kong Dam, 50 km from the dam. There are 109 households of Isan citizens who descended from Thai Korat line. The village area is low land receiving drained water from the

dam and branch streams which flow into Mun River. When the water floods the banks, it flows into the area, causing riverine flood for a longer period than in other areas. Besides with construction of basic infrastructures and urbanization, the natural waterway becomes obstructed. Such location makes the area a flood-risk place, both from heavy rains and flash floods from highland. The village itself risks flooding since it is lowland adjacent to a canal. Villagers are aware of risk in rice paddies and hence manage their land and cropping by planting field crops such as cassava and decorating flowers on the high ground where drainage is good. In the area down below, vegetables and fruits are grown such as cha-om (acacia), string bean and papaya in order to add to their incomes. It was noticed that there is no forest around the area that helps slow down the flow of water.

Most villagers are kinsman living here for a long time. Therefore, they adopt patronizing relationship. For example, in time of floods, the villagers who work elsewhere would send representatives from their family to help or donate money for food and drinking water. People join into groups to build weirs or diversion dikes that direct water into the rice paddies. In the village in 2007, people joined together into the group named "Kum Phuchainam Lam Ta Kong Sai Kaw", a group that manages Lam Ta Kong water both at their own village level and inter-village level. This group had a meeting with officers in charge of Lam Ta Kong water management and obtained access to data related to the amount of water and the discharge periods from the dam for agriculture. The villagers had to know when to divert the water into their paddies and then to the adjacent paddies within the cultivation period.

Additionally, the village had formed relationship with official units in the region. Many official organizations for example, the Office of Community Development and the Office of Sub-District Agriculture encouraged villagers to form into groups to assist each other in other occupations besides growing rice. This has changed the ways of living into an open society with the people exposed to modern living, knowledge and developments. People learn and adjust themselves to many more things, making the village become an outstanding and a pilot village in terms of integrated farming learning resource and sufficiency economy village. When the village faced the flood in 2010, an academic institute and the Department of Water Resources came in to study the flooding problem. Then in 2011, the community's disaster warning network of Lam Ta Kong was established. It can be seen that apart from the inside structure of patronization and self-assistance, the village connects with other villages and organizations outside, leading to effective mitigation of disasters from floods.

The community's flood experiences: The study findings indicated that from 1958 until now, the village faced an average of one flood event every 2-3 years during the rainy season from September to October. The floods had the following major characteristics:

The first characteristic "Flash Flood": This was the slow flow of water from the higher area in the village to the lowland area within 1-3 days. This caused short-period of riverine that drained away. The cause was the seasonal rain in the village itself and in the vicinity which happened nearly every year. The occurrence damaged the farming area not the produce. However, there was impact on the households' living; villagers had to change the crop or the rice paddy time frame. They learned from the past that runoff normally took place after the rain. From 1958-1977, the water collection area was big since there was no road or structure to obstruct the waterway and drainage was fast. In 2002, however, urban areas expanded with construction of infrastructure on the waterways that obstructed the flow. The villagers realized that the amount of water flowing into their area and remained undrained was unusual. A group of villagers consisting of community leaders became aware of the problem and started to dredge the canals and creeks for water to drain more easily and quickly. This showed management at a village level and proved that the village attempted to react to the condition of flash floods. It could be said that this reflected the necessity of communities to adjust their ways of living in order to live with the floods.

The second characteristic "Riverine Flood": This happened when water flew at tremendous amount and was retained for a period of 10-15 days in lowland area of rice fields. The amount was beyond the capacity of any drainage channels because of the downpour. The dam was not able to hold water and had to discharge, it through the spillway causing runoff from higher places. The villagers realized this from observation of the unusual amount flowing into their area until they were unable to drain it away. The impact on the village was great leading to loss of farm produce. Harvesting could not be done and rice breeds were damaged, affecting the people's ways of life. Things left because people could not remove them were damaged. The elderly staying in the house had a very hard time. Other members were not able to go to work, nor could they cook any food. They had to live on the top floor of the house only. Some people worried that the water level would rise and so moved to stay with other families. Management of flood before the hardship was achieved by the leader who announced through the village loudspeaker for the people to get ready. When the

flash flood arrived, the leader led some villagers to evacuate people living in lower area to the higher places. Later, some organizations came to assist during the flood by giving food and necessary items to the people. After the flood, they came again to help restore the place by observing what was lost and paid the victims compensation money.

Most villagers perceived the two events to be caused by nature and thus, they believed nothing could be done to prevent the flood. One villager who faced the flood said:

> It was the natural disaster. It is the nature we are familiar with. Moreover, it was not only us, the others faced it too. We should be considerate to one another. Mostly, waterfalls are downstream of the dam. The dam could not withhold the water. They had to discharge it. Whatever, it will come every year

Then, the event changed from the condition of flash flood to riverine flood, causing losses in the agricultural land and houses close to the canal. A group of leaders learned a lesson from the situation and managed it in order to mitigate the impact and prepare for the flood.

The community's pre-flood management affecting ways of living: The situation of floods that brought impact to the people's ways of living made the community obtain experiences that enabled them to face another flood. The study showed that pre-flood management was implemented through 2 major processes of management: flood disaster mitigation and flood disaster preparedness.

Flood disaster mitigation: The community attempted to reduce impact from flood disaster. This is considered pre-disaster management according to the concept of Coppola (2007) with the following details:

Improvement of houses: The community area is characterized by low land resembling a receptacle for water. Water flew into the canal and to the community; therefore, the place was always inundated. The issue taken into account of the local people was the place to build their houses and the characteristics of their houses. The villagers modified and improved their houses as follows.

Moving the community location from the water stream, formerly, villagers settled down in the paddy fields which are lowland parallel to the stream. When time passed, they learned that flash flood always happened during the rainy season from higher areas around them causing flood problems. This brought with it inconvenience preventing them to travel easily. Before 1957, 8-10 households moved to settle their houses on high land north of the village which is the area of the present village (Fig. 1). One elderly said, "…It's natural for water to come every year. It was about one meter… We moved up here because of the flood during the great grandparents' time." When the city was more developed and growth expanded, their houses became close to the road because the villagers moved up on highland to avoid the current and reduce the risk from flash flood.

Building houses based on the safety and security thinking, formerly, houses were built in a one-story ancient style without raising the floor. The materials were mainly indigenous. During flash flood, the houses were damaged and their ways of life were affected because the houses were not strong. Later, villagers changed the house materials to wood and raised the first floor higher. When the number of household members increased, they modified the houses again to brick and wood two-storey houses. At present, houses had a mixed style of the 50 years ago and the half brick half wood houses where the ground was raised higher than the road level in order to protect against flood.

We can see that the community is situated downstream from the dam and receives impact from flood. This made the villagers changed their houses in order to lessen impact from flash flood. Therefore, they were able to live safely. With the growth of the community, houses were constructed closer to roads further away from the canal. The area is on high land and the villagers felt safer from the flood. They also made their houses stronger and more durable. The houses became half brick and half wood and built on raised ground higher than the road. Technology was used to make certain the houses would not be affected by flash flood. The improvement of houses, moving the houses to high ground and building of house based on safety and security thinking enabled the villagers to face floods and reduce impact from floods. This correlated to the concept by Smith (2004) who said that disasters correlate to decision of the people that settled down.

Alteration of production patterns: This community is fortunate to have fertile land near the canal, allowing them to utilize the area for agriculture, especially rice paddy which is the main occupation in the community (Fig. 2). They produce rice for subsistence as well as for selling. The paddy fields faced flash flood and riverine flood for a long time. When there was flood, the community managed the problem as follows:

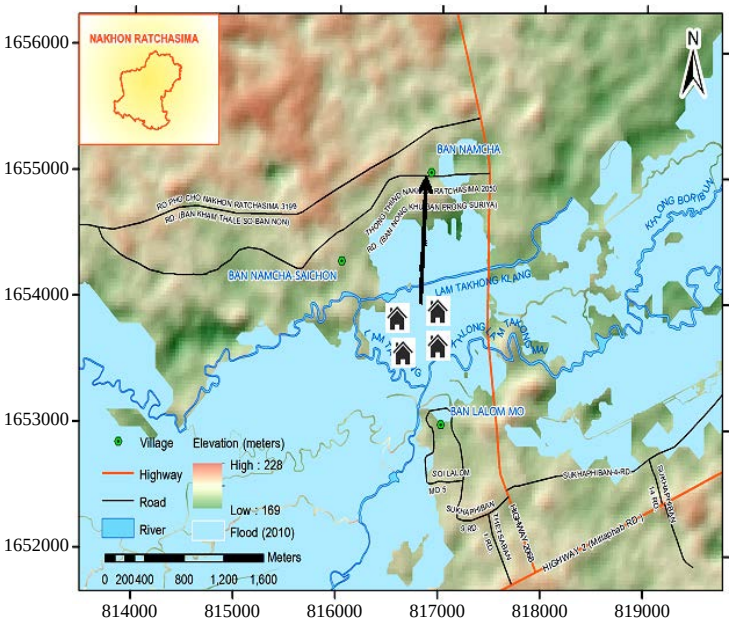

Fig. 1: Village location; Geo-Informatics and Space Technology Development Agency in 2015

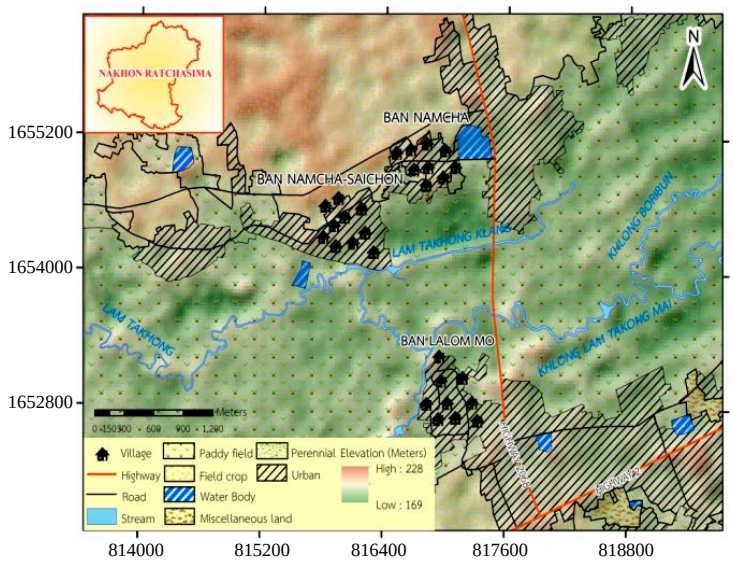

Fig. 2: Land use; Geo-Informatics and Space Technology Development Agency in 2015

Growing the second season paddy, formerly, community households produced rice once a year relying on rainfall. In 2007, they started to grow the second rice by making a site visit and learning from farmers in Ayuthaya. They were then able to grow rice twice a year. The first season was planting in May and harvesting in December. The second season started with rice planting in January and harvesting in May. The reason for doing the second season rice was the location close to the canal. Irrigation water also enables them to produce rice twice. The second season rice becomes the new ways of living to reduce impact from the inundated first season rice fields.

Altering "rice breeds", formerly, villagers grew the indigenous rice ("Lueang pa tew") which is a good breed with high resistance to the surrounding but it took very long before harvesting. Then in 1971, severe flood took place and brought with it great loss of produce. The state then suggested the officially developed breed (Kor khor breed) which is sensitive to light and the harvest time is

shorter than the indigenous breed. Households in the community then changed the breed as suggested but depending on the rice fields. In lowland area (deep fields), they grew Lueang patew and in high land (shallow fields), they use Kor khor breed (light rice). One villager said:

> ...The change of rice breed depended on the field, deep or shallow. The Lueaung patew would allow us to eat. Even though it floods, we still are able to harvest it. Although, the produce was not great, some remains. But if we use the non light-sensitive, we won't be able to eat it. It cannot stand water. Flooding for less than a week makes it rot

It can be seen that selection of rice breeds depend on the characteristic of fields and needs to reduce impact from loss of rice which takes a long time to grow. Villagers having fields in low land are able to reap the produce quicker and before the flash flood and reduce the impact.

The alteration of production patterns, changing from one season rice paddy to two seasons and changing rice breeds is in fact considered normal of inundated communities. It mitigates impact from floods and reduces risks. This correlates to a study by Thuan (2011) which mentioned self-adjustment in rice paddy due to climate changes by increasing production to two or three times a year with support from an irrigation system. Mabe *et al.* (2012) also showed the strategies used by rice farmers from weather change by altering rice breeds.

Flood disaster preparedness: Before 2010, the community did not prepare themselves for flood. Flood management usually happened after the disaster where emphasis was on assisting the victims. After 2010, when the flood disaster was violent and brought great damages to the community owing to lack of warning, community leaders started to initiate ideas to manage and prepare for floods as follows:

Warning and surveillance of flood through networks: Community households had always faced floods since the founding of the village in 1824. Villagers were aware of this when they came to settle down here. They learned from the flood disasters by observing the changes of the environment which indicated that the danger was approaching. These included: observation of water condition if the flowing water turned red and turbid during downpours, then it meant violent flow; observation of termite hill next to the edge of the rice field which was the highest point in the paddy if the water level reached the termite hill then it meant the water was reaching the village; observation of black ants if black ants brought their eggs up the house's pillars, it meant the amount of water would be high that year. Later on when the population increased, land was encroached for more settlement with impact on the ecological system. Therefore, such observations could not always be correct. The only thing the community was able to do was to perform surveillance for the water level. If that was high, words were sent out for folks to move their assets to a higher place. If the flood was severe, then evacuation would take place.

Up until the great flood in 2010 with tremendous flash flood and damages ever happened before to both the farmers and villagers living close to water canal, a group of community leaders learned a lesson from the disaster. They realized that each flood brings with it damages over a vast area and is beyond capacity of any single individual or community to manage alone. In order to minimize the risk, relationship must be built among the people in the community and among their own community and others. When cooperating, they would be able to plan what to do before the flood. Hence, a warning network was formed that assisted the community to efficiently accommodate the floods. The operations of the community network are as follows:

The community network was created from the clustering of farming households who were affected by the flood. The group, comprising village headman, chair of village tap water, chair of water resources and chair of Former Lam Ta Kong Users would manage water problems. They divided the roles among members: villagers conducted surveillance of the water levels at the community bridge and at the adjacent communities; chair of village tap water gauged the water level from the iron rod under the bridge; chair of Former Lam Ta Kong Users contacted with villages upstream to obtain information on the amount of water. Then, they met and consulted each other in front of the Community Hall that was the news distribution point. Following are some interview protocol from community committee:

> ...In the rainy season, when we have problems about water in front of my house at the Community Hall, they have the coffee club where they report the news. Acquaintances usually join there. But if the situation is really bad, we would announce through the village loudspeaker...

The work of the group working on warning and surveillance was in fact not official. Therefore, their operations and communications were efficient, especially during the crisis. They would check the real situation at once as in the following report, "...There was rumor that

water was high at that area, so we drove at once to the place to have a look..."When anyone was informed of something, a consulting group met to plan how to accommodate the flood. It can be said that success depended on self-support of the community people in order to lessen the impact from flood.

Inter-community networks, in term of external networks can be categorized into 2 types. The first was official. In 2011, some academics and officers from the government came to investigate the problem and perceived the fact that the community had no network to report the information about flash floods. Since, the lack of such information could lead to disasters, a center for warning and surveillance of flood in Lam Ta Kong areas was established. The academics supported in terms of knowledge and operational patterns while the government sector through the Irrigation Department 8 supported equipment and tools. The center communicated and coordinated through phone calls with members in upstream areas who sent information to the midstream and then downstream. In 2012, when the flood occurred, people downstream called the upstream people and received information that enabled them to plan for the occurrence. In 2013, the community was able to drain water from their area before the flash flood arrived. The operation of these networks made villagers believe that summoning up power of the community enabled effective operations for flood impact mitigation. In 2007, the unofficial network the Former Lam Ta Kong Users group, was established by those who used the water for agriculture. These people were in the district of Kham Thaleso. The network coordinates about amount of water in the upper river villages. It was led by an arbitrary leader instead of an official leader. However, this person was accepted by the villagers because he had taken regular roles in supporting villagers. This group did not see the importance of setting the group officially because there could be problems in management and setting of roles. They believed that personal relationship among themselves could lead to group freedom to solve village problems better. One community committee said, "I think I would be in trouble if many villagers joined and formed a group. It is better to do it separately and then coordinate for information..." The surveillance and warning operations are shown in Fig. 3.

The operations of the flood warning and surveillance network were based on the community concept that mitigation of flood disasters and impact would be successful only with cooperation from other networks,individuals and communities who assisted in sending information and news. Then, the community could be thought of as having mechanism to face floods. This is in correlation with the concept of the World

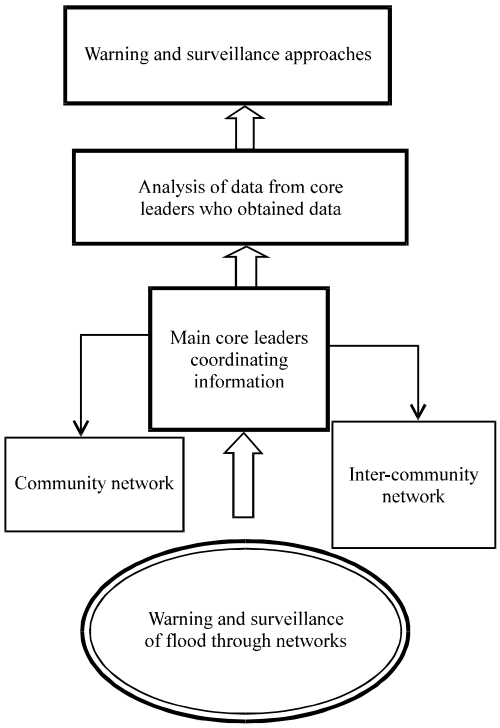

Fig. 3: Flood warning and surveillance through networks

Meteorological Organization (2006) that states efficient mechanism for connecting relevant individuals and setting a network for exchange of news and information.

Preparation of temporary refuge: From the location of the community with risks from flash floods as well as riverine floods, the community had to adjust itself in order to be able to survive. They raised the level of their houses' floors or moved their houses to a higher place for instance. This was achieved for a period of time. However, after the big flood in 2010, the community realized that such actions were not enough for the safety of their lives. Therefore, the community leaders selected and set aside a safe area to evacuate people when the event became violent. Villagers call this area "Nong Wang or Nong Hua Chang" which is situated north of the village. The area is on high land about 7 km from the village. There is a big pond that could be utilized for drinking water and farming. The place was set aside as a temporary refuge and the leader had informed the community people. Rice and foods were prepared in time of disasters at this place. The idea correlated to Coppola (2007) who saw that actions for mitigating loss of lives and assets from disasters, setting of measures to lessen risks and prevention and mitigation, could be done to reduce losses and damages.

It can be seen that the community's mechanism in housing adaptation, changes of production patterns,

warning and surveillance of floods through networks, preparation of an evacuation place could be achieved by the community to reduce their own risks and dangers and most importantly, this is based on the community's potential.

CONCLUSION

In the past, flood disasters in the Lam Ta Kong basin widely affected to residential area. Residents in the affected area had to deal with the disaster for the long time. Therefore, community should act as a resident's tool to deal with the disaster. Community in the Lam Ta Kong basin attempted to response the disaster issue without any helps from government. The community started moving residential area away from flooding and settled their houses on safety area. The community then adjusted their production mode by improving rice breed quality and doing the second rice cultivation. They also set up the warning network with surrounded communities and prepared safety area in case of emergency evacuation. However, their disaster management resulted in many changes within community. Moving residential area caused the change of house settlement pattern. Labor management was affected due to the change of production mode. The indigenous rice breed became less popular. Villagers in the community were not able to solve the flood problems by themselves. They had to adjust themselves to work with other communities or with government units. Lack of chance of decision making might be occurred when they coordinated the plan with various government units. And the preparation of temporary evacuated area resulted in the perception of residents on flood disaster protection. Research results reflected that community had more participation on the pre-disaster management. Community operated the plan through community practices with the coordination from surrounded communities or government units to solve flooding issue. This management approach would bring new knowledge, experiences and information to local community and community then applied these to reduce the disaster risk and improve quality of disaster protection by community.

SUGGESTION

From this study, the following suggestions were drawn: although, collaboration in various aspects of management including cooperation and work with others with the state, both officially and unofficially could reduce impact, they still had some limitations. The community was not able to manage networks in which the operations were not systematic. Moreover, the warning and surveillance networks did not cover all areas. Thus, the government should inform villagers to understand clearly the flood situation and obtain relevant knowledge. On the part of the community, unofficial exchanges of information were advantageous. However, in order to obtain the community's trust, management should be more concrete with the community cooperating with the internal network as well as the external one to achieve quick communication and develop more meaningful cooperation.

With the major roles belonging to the leaders without setting roles to other members not all of the community people could be empowered to work in this respect. Therefore, it is still necessary to make people understand. In the future, if the core leaders are strong, rules and regulations governing the community would be better clarified and hence, the pre-flood management of the community would be more effective.

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