

Disaster Risk Management

Post Disaster Needs Assessment for Sustainable Recovery Thailand Floods 2011



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Cover photos:

Photo1/top: A floating house on the riverfront settlement, Bangrakam Distrcit, Phitsanulok Province, 18th November 2011 (Credit: Rumana Kabir, UNDP)

Photo 2/middle: Outskirts of Bangkok, 14th November 2011 (Credit: Yang Fang, UNDP)

Photo 3/bottom: Community focus group meeting facilitated by the government officials in Phitsanulok Province, 17th November 2011 (Credit: Rumana Kabir, UNDP)

List of Abbreviations

ACHR: Asian Collalition for Housing Rights
BMA: Bangkok Metropolitan Administration
CBDRM: Community Based Disaster Risk Management
CBDRR: Community Based Disaster Risk Reduction
CODI: Community Organizations Development Institute
DDPM: Department for Disaster Prevention and Mitigation
DPMA: Disaster Prevention and Mitigation Act
DPM: Disaster Prevention and Mitigation
DRM: Disaster Risk Management
DRR: Disaster Risk Reduction
EOC: Emergency Operation Center
ERT: Emergency Rescue Team
FROC: Flood Relief Operation Center
HFA: Hyogo Framework for Action
NDPMC: National Disaster Prevention and Mitigation Committee
NDPMP: National Disaster Prevention and Mitigation Plan
NGO: Non-Government Organization
PDNA: Post Disaster Needs Assessment
RID: Royal Irrigation Department
RTG: Royal Thai Government
SME: Small and Medium size enterprises
SNAP: Strategic National Action Plan on Disaster Risk Reduction
OTOS: One Tambon One Search & Rescue
TMD: Thai Meteorological Department
THB: Thai Baht

Risk Profile

Thailand is regarded as highly vulnerable to natural disasters caused by hydro-meteorological phenomena (floods, landslides, storms, droughts, etc.). Especially, Thailand had frequented floods almost annually and they have become the most devastated disaster of the country. Thailand is ranked as the 7th most flood prone country in the world.¹ The official statistics during 2002-2008 shows that on average and [W1] annually, 10.1 times flood events occur, 43.7 provinces are affected, 95.8 persons are killed and 5,884 Million Baht are recorded as economic loss.²

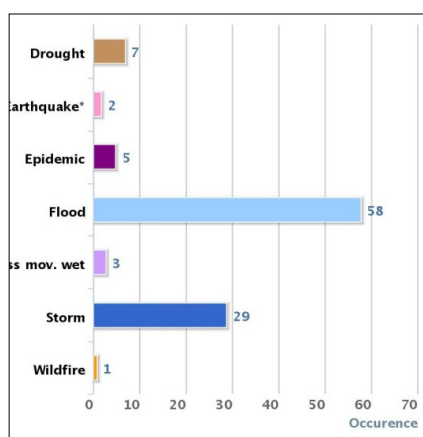


Table 1: Natural Disaster occurrence reported (1980-2010), Source: Preventionweb

Hazard Type	Population exposed	Country ranking
Cyclone	5,147	52nd out of 89
Drought	2,444,010	31st out of 184
Flood	819,822	7th out of 162
Landslide	2,496	42nd out of 162
Earthquake	22,860	92nd out of 153
Tsunami	3,487	54th out of 76

Table 2: Population exposed to hazards and country rank (1980-2010), Source: Preventionweb

Floods pose the greatest threat to Thailand, in terms of mortality and GDP impact.³ On the other hand, the number of population exposed to drought is higher (Table 1), whereas cyclones pose a minor risk to the northern portions of the country and with frequent tropical storms in the coastal areas. The Multi-hazard Disaster Risk maps indicate that Thailand is significantly affected by hydrological and drought events, particularly in the central, eastern, and southern regions. Thailand also faces earthquake and tsunami risk as has been experienced in 2004, with 8,221 loss of lives.⁴

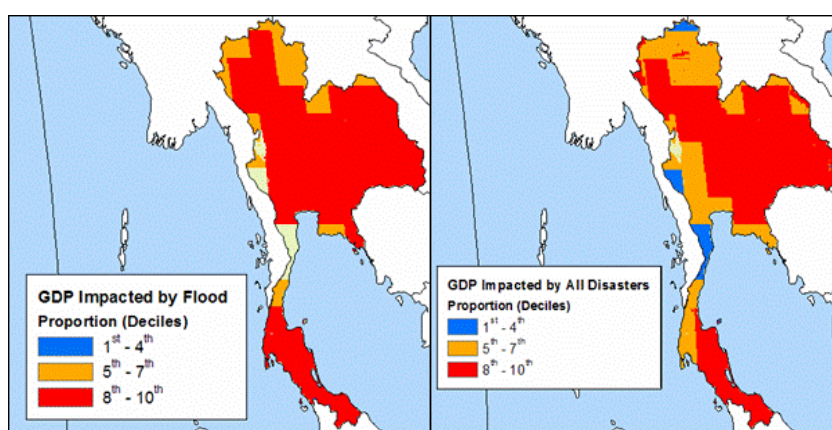


Figure 1: Thailand risk profile showing the impact of all disasters, Source: Natural Disaster Hotspot⁵

¹ Preventionweb: <http://www.preventionweb.net/english/countries/statistics/index.php?cid=170>

² National Disaster Preparedness and Mitigation Plan, p4.

³ Natural Disaster Hotspot: Global Risk Analysis http://www.ideo.columbia.edu/chrr/research/profiles/pdfs/thailand_profile1.pdf

⁴ Prevention web

⁵ Natural Disaster Hotspot: Global Risk Analysis

http://www.ideo.columbia.edu/chrr/research/hotspots/documents/hotspots_backgrd_acknowl.pdf

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DRM Policy and Institutional Framework

The Department of Disaster Preparedness and Mitigation (DDPM) was established in 2002 under the Ministry of Interior by restructuring five government institutions. In 2007 The Disaster Prevention and Mitigation Act (DPMA) was passed from where DDPM is mandated to coordinate as a focal point for all types of disasters. In the past the national civil defense act, did not have a coordination mechanism, for which this new act was passed. DDPM operates in all 76 provinces and has 18 regional centers. However, according to the provincial DDPM the current structure does not have enough guidance for regional cooperation and only focuses on the provinces.⁶ Some of NDPMA features are,⁷

- (1) Scope of disaster management activity has been extended to encompass all types of
- (2) Designating National Disaster Prevention and Mitigation Committee to lay down policy for formulating National Disaster Prevention and Mitigation Plan (NDPMP)
- (3) Designation DPPM as national focal point to carry out disaster management activities of the country
- (4) Formulation of three disaster prevention and mitigation plans (each for National, Provincial and Bangkok Metropolitan
- (5) Clearly identifying authorized persons and their disaster management tasks at all levels.

National Disaster Prevention and Mitigation Committee (NDPMC) is a national multi-sectoral body responsible for policy formulation and planning for disaster preparedness, mitigation, and response. NDPMC is chaired by the Prime Minister or the Deputy Prime Minister whom the PM entrusted as chairman. NDPMC includes representatives of line government organizations and qualified persons appointed by the Cabinet.

The National Disaster Prevention and Mitigation Plan (NDPMP) (2010-2014) provides a basis for national-level DRM activities, such as

- (1) Conceptual Framework of disaster management
- (2) Classification of disaster scale
- (3) Role and Responsibility of government ministries, agencies, state enterprises
- (4) Standard Operating Procedure

Apart from above there are numerous ministries and actors for various aspects of disaster risk reduction (DRR), such as (1) Thai Meteorological Department (TMD) providing weather forecasts and disaster warnings, (2) The Royal Irrigation Department (RID) who manages most of hydraulic facilities such as drainage canals, sluices and dams, etc.⁸

On the other hand the Strategic National Action Plan (SNAP) on Disaster Risk Reduction 2010-2019 is produced by DDPM to ensure Disaster Risk Management is mainstreamed in the national plan within all government institutions and also is a national priority as has been stated in the Hyogo Framework of Action (HFA).⁹ However, this strategy being very recent has not been made familiar within the government institutions.

⁶ 'The current Disaster Prevention and Mitigation Act (2007) focuses on provincial level and does not support a regional approach of response, while the old 1971 version did address this. The current act is considered not being able to meet the challenge of a larger scale disaster, which required a more decentralized response.' - Interview with Director of Training Center, DDPM Nakhon Sawan Province, 14th November 2011.

⁷ Disaster Prevention and Mitigation Act B.E.2550 (2007), Department of Disaster Prevention and Mitigation, Ministry of Interior, RTG.

⁸ National Disaster Prevention and Mitigation Plan B.E.2553-2557 (2010-2014), Department of Disaster Prevention and Mitigation, Ministry of Interior, RTG.

⁹ Strategic National Action Plan (SNAP) for Disaster Risk Reduction 2010 – 2019, Department of Disaster Prevention and Mitigation, Ministry of Interior, RTG.

Chronology of Flood 2011

The main natural driver of Flood 2011 was apparently the unprecedented heavy rains caused by monsoon and a series of Typhoons, since mid-May to October 2011. In June, heavy rainfall occurred in many locations throughout the month. During late June, affected by tropical depression "Haima", heavy rainfall in several areas especially in the northern part. In July, downpour rain continued in many areas in addition with tropical depression "Nock-Ten", which brought heavy rain to several areas resulted in widespread flooding in north and northeast parts. During August to September, many areas such as northern, central and northeastern parts experienced wet condition caused by the active southwest monsoon and the rather active monsoon trough. Massive flooding persisted mainly in lower northern and central parts. In October the northeast monsoon prevailed over Thailand since around mid-month. Meanwhile, the monsoon trough moved southward to lie across central Thailand, bringing occasional rain. Associated with the high tide, severe flood and extensive damage in the lower northern part has extended to the central part including the Chao Phraya River Basin, most areas of northern, eastern and western Bangkok and its vicinity.

The rainfall amount of Thailand since 1 January to 31 October was 1822.4 millimeters, about 28 percent above normal and the October rainfall was 201.8 millimeters, 10 percent above normal. Seasonal rainfall from May to October in 2011 was above normal of 20 – 60% for most Meteorological Station in northern part and of 10 - 40% with below normal in some areas in central part.

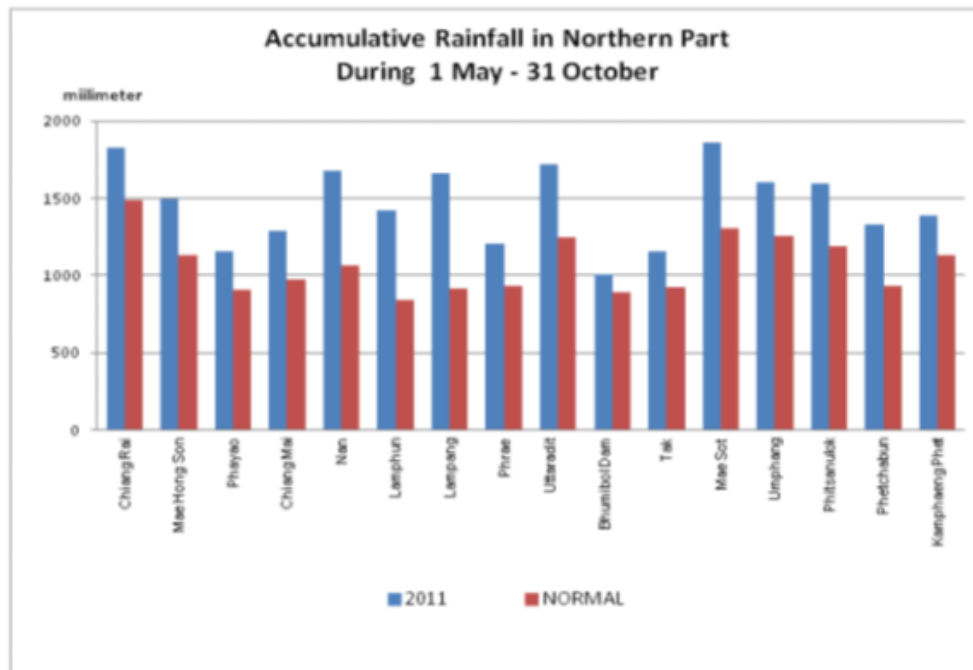


Figure 2: Accumulative Rainfall in Northern Part, During 1 May-31 October (Source: Thai Metrological Department)

Institutional Arrangement and The Flood Response

Due to the dramatic increase of flood, the Prime Minister Yingluck Shinawatra announced the use of Section 31 of the Disaster Prevention and Mitigation Act on the 21st Oct. 2011.¹⁰ Under this act the Prime Minister or the Deputy Prime Minister assigned, has the full authority to command and direct all government agencies and local administration agencies to implement measures for disaster relief and protection, as well as provide assistance to the affected people in designated areas.. The committee is chaired by the Justice Minister and comprises experts tasked in advising, monitoring, and setting guidelines and measures to divert water and lessen the impact of the floods.

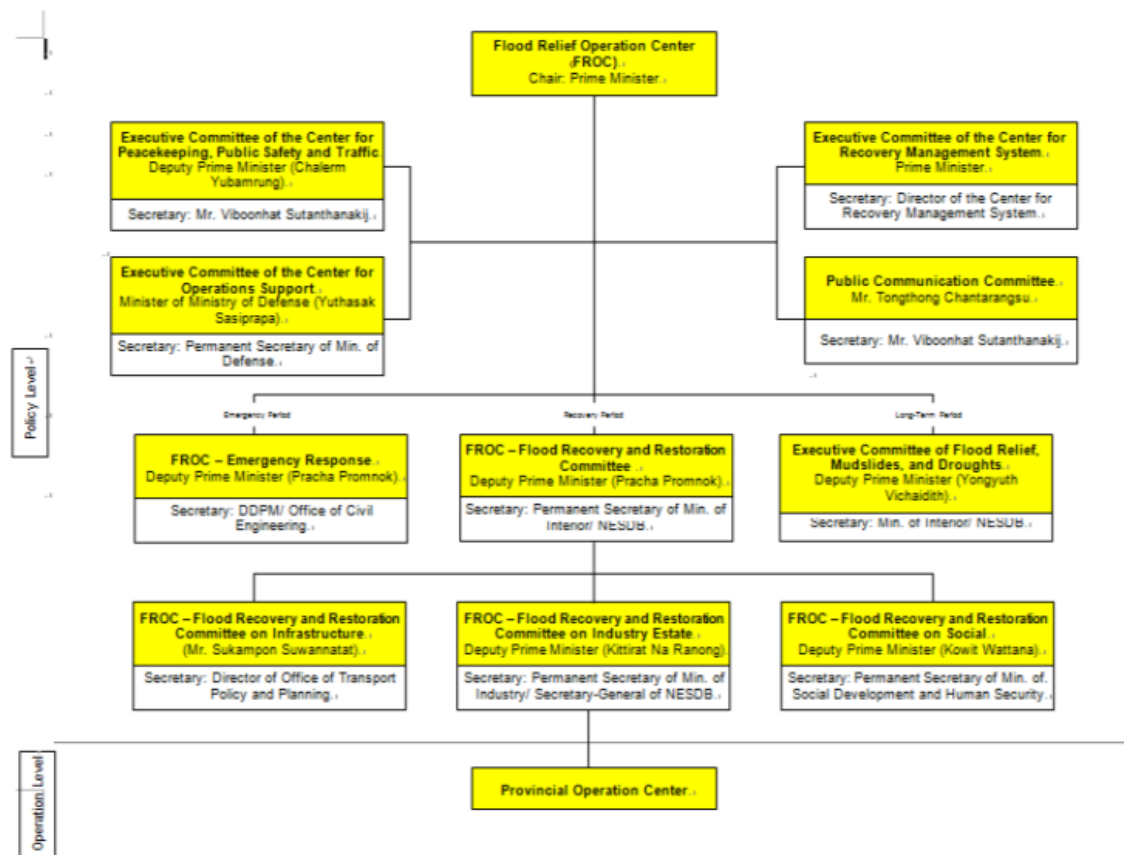


Figure 3: Organogram of Flood Relief Operation Center (FROC) as of 8th November 2011,, Source: DDPM

On 25 October the Cabinet approved a four-phase relief and recovery plan and package for immediate response, flood assistance, post-crisis rehabilitation and long-term phase. Relevant ministers also carried out their respective responsibilities on social protection, sanitation and hygiene, transportation, education and water management, etc.

The Government also set up a National Committee to prepare a comprehensive strategy for the country's rehabilitation to make Thailand better, safer and stronger. The strategy is separated into three parallel phases, namely, the 3R's – Rescue, Restore and Rebuild. Immediate relief and rescue efforts include receiving donations, distributing relief assistance, providing medical care and temporary shelters and dispatching support personnel to the fields.

¹⁰ Disaster Prevention and Mitigation Act B.E. 2550 (2007), DDPM, Ministry of Interior, p 85.

RTG also launched a financial package of THB 325 billion (USD10.3 billion) to assist people and business sectors affected by the floods. In addition, Plans also put in place to provide skills training and financial support for the estimated 660,000 workers who were not be able to resume work as workplaces have been halted.

Shortly after the water receded, the Government started assessing damages and processing compensation under the THB 5,000 scheme for majority of the eligible households through local banking system.

Apart from the efforts of the Government, the military as well as civil society organization such as the Thai Red Cross Society (TRC) and private sector organization provided critical manpower and assistance for flood relief work, which include 54,000 military personnel deployed to build, monitor and repair flood barriers, evacuation and transportation support, and medical and emergency assistance throughout the affected areas. The Stock Exchange of Thailand (SET) has set up a 500-million-baht flood relief fund with donations from SET listed companies to assist with immediate assistance for affected people, as well as support rehabilitation and recovery for business and civic sectors. The unprecedented scale of this year's flooding and the continued threat posed has resulted in an international response to assist the Thai authorities and flood victims. Since the situation unfolded in October, Thailand has received international funding of over US\$20 million from various donors, including Japan, China, EC, Canada, Australia, and etc.

Risk Assessment¹¹

Information about hazard and risk is the critical first step to any comprehensive risk management plan. The desire to build back better following a disaster demands an improvement in risk information and public awareness in order to avoid rebuilding vulnerability into the recovery and reconstruction process. In Thailand, however, the flood risk assessment results were rarely shared among citizens. According to NDPMP, more than 10 Ministries and organizations are designated as key implementing agencies for “undertaking of risk assessment on flood and landslide hazard and evaluating existing condition of vulnerabilities to reveal the probability of their occurrence”, such as DDPM, Ministry of Mineral resources, Thai Meteorological Department, Land Development Department, Department of Water Resources, Royal Irrigation Department, provincial government, local administration office and Bangkok Metropolitan Authority (BMA). In addition to the government’s response, many stakeholders and institutions are responding to the relief and recovery effort. Due to such complexity, coordination, and standardization role is of great importance to precede flood risk assessment.

It is necessary that results of risk assessments are useful for various purposes, such as public awareness raising, base information for public and private investment projects, disaster preparedness and prevention. Risk assessment necessarily need be exercised by scientific and academic tools. Therefore proper assessment methodology should be developed in the first place. This may need to incorporate knowledge on satellite technology, meteorology and hydrology, etc. Such cutting edge technology will need to be mobilized for assessing urban areas and whole basin level. On the contrary in rural and community level, risk identification through community-based approach will still be a useful tool. Community-based risk identification approach will also contribute for awareness building and enhancing the sense of ownership among local residents. In addition, tropical cyclones could advance from the Andaman Sea towards the east. Storm surges in Bangkok could be serious, and the worst-case scenario should be developed to raise awareness of decision makers and general public.

In addition, technical risk assessment such as the hazard maps and simulation outcomes needs to be translated into a user-friendly manner so that policy makers can make the right decision, practitioners and general public could understand what action to take. Flood marks may provide precious information in validating accuracy of flood simulation models that need to be developed and exercised. Therefore preserving flood marks in as many locations as possible with the date it occurred, would be essential.

Simulation exercise may be useful with various mega-hazard patterns such as to taking into consideration, cyclone, assuming the worst-case scenario, causing huge storm surge, matched with high tide. By exercising multiple hazard simulations, preparedness and response planning would be enriched.

¹¹ This Chapter is written by Katsu Miyake, World Bank

Climate Change Prediction

It is important to incorporate the anticipated climate changes into Thailand's risk profile and conversely the newly identified needs and vulnerabilities of the flood affected cities and communities into projected risk management activities and climate change adaptation plans. The resilience of cities and communities will need to be reassessed and rebuilt in light of changes to infrastructure and all relevant sectors. Thailand is ranked 4th among countries with the largest total climate-related economic losses by 2030, after USA, Russia and Japan. Bangkok is one of the largest mega cities in Asia and is considered as a high-risk hazard prone city. Bangkok Metropolitan accounts for approximately 40% of national GDP.¹² The ground level, being close to mean sea level, has great susceptibility to flooding and inundation. The sea level rise may add to the threat of land subsidence, flooding and tropical cyclone.

' In 2050 the number of persons affected (flooded for more than 30 days) by a 1-in-30-year event will rise sharply for both the low and high emission scenarios—by 47 percent and 75 percent respectively, compared to those affected by floods in a situation without climate change. Bangkok, the increased costs associated with climate change (in a high emission scenario) from a 1-in-30-year flood is THB 49 billion (\$1.5 billion), or approximately 2 percent of 2% of gross regional domestic product. The actual costs of a once-in-30-year flood, including costs resulting from both climate change and land subsidence are close to \$4.6 billion in 2050.'

- Climate Risks and Adaptation in Asian Coastal Megacities (2010)¹³

Although the above prediction indicates that with future threat from climate change, in the near future Bangkok and many other towns in Thailand will be exposed to more hazards and economic losses.



Photo 4: Bangkok 14th November 2011 (Credit: Yang Fang, UNDP)

¹² Climate Vulnerability Monitor 2010 – the State of the Climate Crisis, DARA, 2010

¹³ "Climate Risks and Adaptation in Asian Coastal Megacities", ADB, WB and JICA, 2010, http://siteresources.worldbank.org/EASTASIAPACIFICEXT/Resources/226300-1287600424406/coastal_megacities_fullreport.pdf

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Lessons From Flood 2011

Evidence based learning is essential for implementing DRM policies that caters to the need of the affected people and responsible institutions. Based on findings from field visit to Nakhon Sawan, Phitsanulok provinces, Bangphlat district and meetings with DDPM, BMA, various government officials, private sector representatives and some affected communities the following lessons are captured.

- **Early warning and preparedness:** In the case of 2011 floods, despite constraints on flood analyzing and forecasting tools, early warning information was issued in a timely manner. However, such constraints to some extent have hampered the authorities' ability to assess and forecast disaster for better preparedness. Data and information to manage flood situation is under a number of responsible agencies, including the Thai Meteorological Department, the Royal Irrigation Department, the Department of Groundwater Resources, the Department of Mineral Resources, the Electricity Generating Authority of Thailand (large hydro-electric dams), etc. Thus, a coordination system among various agencies to achieve a unified incident command system will be needed for more effective early warning data and system as well as flood and disaster management in future.
- **Emergency management:** A number of national disaster response committees were set up, though on an ad-hoc basis, in response to the changing and evolving flood situation. These include the Emergency Operation Center for Floods, Storms, and Landslides (EOC), set up on 22 August 2011, and the Flood Relief Operation Center (FROC), set up on 21 October 2011. The designation of a national focal point/agency to carry out disaster management activities was although in line with the National Disaster Prevention and Mitigation Act (2007), it was not adequate enough to address the emergency, blurring the roles and responsibilities and causing confusion in coordination. However, such ad-hoc approach was also seen in other countries, reflecting more of the need to review the DRM plans and the Act to be less rigid and to avoid a one-size-fit-all DRM approach/model and to take into account the differences in disaster types and scales. Furthermore, the emergency and disaster management mechanisms relied on the provincial and local administrative structures which are area specific, but lack coordination across the administrative areas. While in-depth knowledge of areas is an advantage, the lack of coordination has played out quite evidently in the flood prevention, management, and response – i.e. each province and TAO plans their own prevention, response and recovery efforts with little views on holistic impact. In certain areas, the lack of coordination and holistic water/flood management has led to conflicts among communities living along boundaries of these administrative areas. Lastly, disaster management plans and efforts are also skewed towards emergency response and less on preparedness and prevention. Thus, more emphasis should be given to improving coordination, preparedness and longer-term mitigation efforts as stated by a local government official,

'For the past 2 years, we have experienced floods three times. Sandbag walls of 5 km long, 1.2 meter high were set up since 9th September in an attempt to prevent floods. But the height of the flood water reached 1.7 meter high and the water overflow on the 3rd October. Announcements were made to the communities on updated disaster situation. However, due to the lack of accuracy available on the scale of flooding, people found it hard to follow any instruction and guidance for local preparations. The evacuation centre announced for the communities was also flooded. The sub-district has more than 7,600 households and the area is 100% flooded. Local government office requested for materials support both from the District and Provincial office, e.g. boats, pumps and gasoline. But relief equipments were either used in the upstream flooding areas or were difficult to deliver due to transportation interruption. Most of our relief funding was from sub-district's own budget. Given the unsuccessful efforts in flood prevention, we learned that it will be better to save money from sandbags to meet recovery needs, if similar case happens in the future.'

– Interview with a Sub-District Head, Nakhon Sawan Province, 14th November 2011

- Impact and response in rural and urban areas:** Adaptability and resilience is different between rural and urban communities. The built-up housing and settlements in many urban and sub-urban areas have generated greater vulnerability and challenges in flood prevention and management efforts. Many sub-district, district, and provincial administrators have expressed concerns over effectiveness of city planning and land use enforcement. While flooding in rural areas and also in urban riverfront settlements is a regular occurrence, many urban and sub-urban areas have not experienced flooding for more than 10-15 years. As a result, people in the rural and urban riverfront areas are more adaptive to their livelihoods and ways of life. Also those living in high risk urban areas, deal with regular flooding and other environmental hazards. Due to the less frequency of floods in urban areas, the provincial authorities as well as DDPM have less guidance available to be able to manage and prepare for disasters in urban settlements. Nonetheless, many lessons and experiences from the local NGOs working in poor urban communities such as Community Organizations Development Institute (CODI), the Asian Coalition for Housing Rights (ACHR) and from the Bangkok Metropolitan Administration (BMA)'s conflict management and coordination experiences with neighbouring areas outside Bangkok, , can be shared with other provinces, particularly in the areas of relief operation, private sectors' contribution in technical expertise and equipment and citizens' participation.¹⁴
- Evacuation planning and community participation:** Evacuation is an integral part of any emergency response. While guidance on evacuation orders and plans in place¹⁵, the challenge remains in people's compliance with them. The problem is well stated by an official: *"people will not evacuate when they can and want to evacuate when it is not possible"*. Many people also believed that relief and assistance would be delivered to their doorsteps. Such belief was due to the experiences of doorstep delivery of past relief efforts. If the evacuation orders and plans were to be effective, this incentive mechanism needs to be reviewed; evacuation of the sick, elderly and infants need to be in place. This non-compliance is more problematic in urban settings, where resources for relief operations would continue to be stretched, especially when trying to provide such doorstep relief operations. Evacuation orders and plans would need to be revisited to reflect the reality. In an event of floods, many rural people have adapted well to the situation, such as living in a traditional Thai houses or floating houses with boats for using during rainy season and regular flooding and the need for evacuation might be less relevant. Another issue concerning evacuation is related to thefts and public safety. Many people, especially in urban areas, refused to evacuate because of theft fears and reluctance to leave their assets and belongings behind. Measures to ensure public safety was reactive and was only put in place when the public has voiced their concerns. The peacekeeping, public safety, and traffic committee established under FROC should be considered as an integral part of future NDPMP.

'In the beginning three schools were selected by the district office for evacuation centers. Twelve more teachers and myself volunteered to help with the preparation work within a week. We expected around fifty evacuees, but the number jumped to 250 people and then the downstairs got flooded. So we had to move the kitchen and the elderly and disabled people upstairs. The water pump got damaged and was under the flood water. I had to pay for a plumber from my own pocket. The whole district got flooded, including the school. People were asked to relocate to another center outside Bangkok, but they did not want to leave their community, to be able to check their assets at home regularly. We arranged the classrooms for families and the neighbors they know to stay together. Sometimes we also separated women and men. In one room we had to accommodate 20 adults, 10 children with one newborn, who is nearly a month old and is named Water (Naam).'

- Head teacher, a school-turned evacuation center in Bangkok¹⁶

¹⁴ The Section 32 of the NDPMA focuses on the role of the Governor of Bangkok to have the full authority to manage catastrophes. BMA's Disaster Management Plan (2011-2014) focuses on fire, toxic, transportation, drought, cold and weather.

¹⁵ Airport, stadiums, university campuses, temples and schools were used as evacuation centers in urban areas and Bangkok whereas the community centers were used as evacuation centers in rural areas. These were established on an ad-hoc basis upon instructions from the local government offices in a short notice. Many evacuation centers had to be relocated because floods have reached these areas.

¹⁶ Field visit, Bangphlat district, Bangkok, 21st November 2011

- **Prevention:** DDPM volunteer training, Community Based Disaster Risk Management (CBDRM), and One Tambon One Search and Rescue Team (OTOS) make a difference to DRM/DRR, but lack of due regard to DRM in government policy and planning as well as hazard-free country perceptions among Thais have given rise to budget constraints and inability to implement the training across nation, rendering discrepancies in capacity to plan and respond at all levels. Communities with stronger leadership and Disaster Prevention and Mitigation (DPM) teams (DDPM volunteers, rescuers and community volunteers) as well as greater engagement of civil society organizations respond and recover better. For CBDRM, training has been delivered for communities and community volunteers. DDPM has identified 27,000 communities living in the high-risk areas. Out of this, only 5,400 communities have been trained. Male volunteers dominate the emergency response team while health volunteers are mostly women. DDPM has also implemented 'One Tambon-One Search and Rescue Team' (OTOS) programme in selected villages or *Tambons*. The plan is to train 77,000 people and establish 7000 teams nationwide. Lastly[W4], since DDPM has still a long way to go in training high risk communities, it is essential to partner with other community driven development experiences across the country to extend their outreach. It is important to learn from a comprehensive review of 2011 floods experience, that would review limitations in many non-structural issues, some of which are aforementioned. Thus, these non-structural measures should be considered in tandem with many structural considerations that are being put forth by the RTG to prevent future flood disasters.



Photo 5: A high-risk flash flood prone community explaining their Community Based Disaster Risk Management Programme (CBDRM) in Phitsanulok province 16th November 2011 (Credit: Yang Fang, UNDP)

Disaster Risk Financing¹⁷

This catastrophic flooding this year in Thailand may lead the international reinsurance market to reclassify Thailand as a high-risk country subject to catastrophe risks for the next reinsurance season starting on January 1, 2012. This would imply limited reinsurance capacity, and/or lower coverage limits and/or higher reinsurance premium rates. It will be critical to restore the confidence of the reinsurance market on the capacity of the government of Thailand not only to manage major floods, but also to have greater domestic capacity to absorb losses if they do still happen. Otherwise, if the international reinsurance market thinks that such a level of losses could happen again with any frequency, they will make flood reinsurance either unaffordable or simply unavailable.

The vast majority (90-95%) of the property catastrophe risk insurance business underwritten by the domestic insurers is reinsured abroad, according to the Office of the Insurance Commission. This means that the net retention of the domestic insurers should not exceed 15bn THB (in fact, our best estimate based on the information currently available is that it will be around 10bn THB). The domestic insurers should then be able to pay their claims in full, although some may face some significant depletion of capital.

Building on the recent disaster risk financing and insurance framework proposed at the WB/ASEAN Forum on Disaster Risk Financing and Insurance¹⁸, the Government of Thailand may want to consider an integrated disaster risk financing strategy, as part of its overall disaster risk management agenda, to increase the financial and fiscal resilience of the country against natural disasters. Such a financial strategy would complement the risk mitigation investments (such as investment in water management).

In the light of international experience, such insurance pools rely on close partnerships between the government and the private sector, and require strong and continuous support and commitment from the government. Development of an operations manual for an agricultural insurance pool would normally cost around 30mln THB. There may also be a need for some government guarantee (in the form of line of credit and/or reinsurance of last resort). This is difficult to quantify at this stage as it depends on the type of perils and crops covered under this pool, and thus is not included in the calculations at this stage.

¹⁷ This chapter is written by Luc Vaillancourt, World Bank, for the PDNA main report.

¹⁸ ASEAN/WB Forum on Disaster Risk Financing and Insurance, November 8-10, 2011, Jakarta, 2011.

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Recommendations

This chapter elaborates on the recommendation based on the PDNA exercise and concludes with the suggested summary of activities that needs to be implemented by the RTG and other stakeholders. Some of these recommendations may be useful for future programming and capacity building for the disaster risk management in Thailand.

A. Strengthened communication and risk awareness

Short-term (six months)

- **Continue the needs assessments:** Many parts of the country is still under water and it has been a challenge for gathering information and planning for future recovery by the provincial and local government. To incorporate disaster risk reduction it is important to monitor and assess the existing situation to collect real time information.
- **Communication strategy:** It is essential to set up a consistent communication strategy for the next hazard or disaster to come as many people were confused with mixed messages. Therefore streamlining formal and informal communication channels should be prioritised. It is also essential to disseminate the recovery policy and information on types of compensation, its eligibility, how to access compensation, grievance and redressal mechanism for the affected people and institutions in the coming months. In addition to this, early warning, hazard awareness, guidance for both rural and urban recovery, needs to be disseminated through media with consistent messages. This will restore resilience and confidence amongst people to 'build back safer'.

Medium-term (two years)

- **Multi stakeholder capacity assessment and resource mapping:** Mapping resources amongst all stakeholders, government agencies from region to sub-district level, defence (police, army etc.), private sectors, NGOs and civil society institutions will be essential for future responses and recovery. Many stakeholders came forward to share their resources and expertise to deal with flood. Although there are private sectors and civil society organizations involved in the response and recovery activity, no formal reporting or coordination mechanism with the government has been observed after the flood. Resource mapping and capacity assessment is needed to create a database for future disaster response. This will help the government to know who is doing what and where and ensure replication of efforts is avoided and timely coverage of assistance is provided[W5]. For example, the use of Open Data Platforms (Open DRI) and strict data sharing protocols amongst the involved institutions, crowdsourcing tools, Frontline SMS, Open Street map and Ushahidi are some good practice, which can be used in future.
- **Integrated early warning with multi-hazard mapping:** Thailand has multiple hazard threats and different institutions are responsible for different hazard mapping. Early warning system should consider all the possible threats and have a consistent strategy to inform people and government about the potential threats from hazards. Early warning systems could only be effective if they actively involve the communities at risk, facilitate public education and awareness of risks, effectively disseminate messages and warnings and ensure there is constant state of preparedness. Therefore, improved forecasting and equipments with both local and national level, use of technology and local knowledge and engaging with disaster management experts, research institutions to help integrate information across different authorities will be necessary to mainstream and improve early warning system.
- **Programme planning with defence and civil society institutions:** Engage with defence sector, specifically for security measures and evacuation plan, grass-roots organizations, both men and women's groups and private sector in DRM planning, implementation, monitoring and evaluation processes. This will allow the government to demonstrate

accountability and transparency for future decision-making. For example, crowdsourcing is a tool that can help to develop this mechanism in place.¹⁹

- **Scientific and socio-economic assessment and analysis** of 2011 flood with collection of gender disaggregated data will be essential for future learning and institutional capacity strengthening. Academic institutions, research bodies, community development organizations and private sectors can be engaged with the RTG to take initiative to learn from other countries, across the regions and also within the country.
- **Information management** before, during and after a disaster is crucial for DRM. Upgrading the reporting, disaster database, relief inventory system by using modern technology will help cross sectoral and cross governmental coordination for timely decision making. For example, enrichment of “Desinventar”, for data collection of past disasters, computerized and efficient logistical system developed for warehouse management including tracking systems of relief goods and external aid acceptance are some measures that can be introduced based on the lessons from the recent response. In addition to this, local level technological intervention is also proposed by DDPM,

‘If GIS database is available in sub-district and community level, then it will be easy to manage information to know centrally and to allocate resources accordingly. Some provinces already have this system in place.’²⁰

Long term (five years)

- **Risk assessment of climate change impact:** There is a need to incorporate risk assessment results into future development plans. Climate change related hazards would continue to affect the country, especially Bangkok. The RTG currently facing challenges with strategic decision whether to further protect Bangkok, or to relocate parts of the city.²¹ This is critically important decision that need to be made considering the importance of Chao Praya basin and the multiple threats of continuing subsidence, growing development, sea level rise and increasing rainfall variability. To make such strategic decision, environmental adaptation measures both grass roots and high tech, should be incorporated in the longer term recovery planning, by working together with cities and communities at risk, by engaging civil society and private sectors.

B. Strengthened DRM Mainstreaming

Medium-term (two years)

- **Recovery policies to take into account different needs of urban and rural settings.** Examples from many disasters show that urban recovery is more complex and time consuming. Therefore it will be essential to have recovery strategy to reflect the urban needs for mainstreaming disaster risk reduction. BMA and DDPM need to be involved together with the private sector and civil society institutions for urban recovery strategy development and implementation across the country. Additionally DPMA needs to consider integration of urban towns and its development policies in its provincial level disaster management and planning process.
- **Community Based Disaster Risk Management (CBDRM),** search and rescue training need to cover a wider part of the country. Sharing experiences, exchange visits across cities, villages, sub-districts, provinces, and regions, neighbouring countries to learn on adaptability to climate change and preventive measures will also enhance the quality of community and citizen led initiatives. It is essential for DDPM and BMA to partner with the community driven development experiences across the country to learn from the other community based DRR initiatives to be able to extend their outreach. Thailand has a wider community volunteer network across the country, which should be more strengthened, as

²⁰ Meeting with DDPM Bangkok, 18th November 2011, field visit to Phitsanulok province, 16th November 2011

²¹ If the peer reviewer or the main editor can provide a source that will be good. As DRM chapter authors we cannot provide any details as we haven't really talked to anyone to look in detail into this issue during our assessment. Only did lit reviews.

UNDP Internal Report on DRM-PDNA, November 2011 Email: rumanakabir2003@yahoo.co.uk kwanpadh.suddhi-dhamakit@undp.org

many of the community volunteers are not active. Incentives, awards and good practices should be introduced; such as volunteer of the year, national, regional and provincial award systems to encourage active volunteerism. Although Thailand is an open society, promoting gender equality in disaster risk reduction and ensuring gender-mainstreaming recovery in support of both women and men to build back better. Efforts need to be made to ensure elderly, disabled; women, men and children's unique interests are incorporated into CBDRM.

- **Non-structural measures should be mainstreamed with structural measures:** Participatory environmental impact assessment, evacuation strategy, conflict resolution and multiple-hazard mapping should be well integrated during infrastructure recovery and planning process. As many critical infrastructures as well as evacuation centres were flooded and many communities were in reluctant to leave their belongings behind in fear of theft, the design of infrastructures and ensuring security of assets should be considered in the evacuation strategy, by engaging defence sector. On the other hand, many communities, provinces including the BMA are in conflict with their neighbours as well as with various government authorities, environmental NGOs and communities. Therefore tradeoffs and conflict resolution should be part and parcel of the flood recovery and water management plan for communities and institutions to have a holistic picture of the environmental impact with consideration to multiple hazards.

' First of all we don't need to only build more infrastructure, but also provide skills to empower people for disaster prevention. Mostly we have seen the use of sandbags as a preventative measure up to one meter high. But when you try to protect your own territory, you let the water pass through your neighbors' territory. New initiatives should focus on empowering provinces on prevention.'

- Mr Songchai Rohitachart, Director, Disaster Prevention and Promotion, DDPM

Long term (five years)**Safety culture and resilience:** Many people and institutions in Thailand had less exposure to large-scale disasters, although many part of the country faces regular hazards like typhoon, fire, flood, landslide, drought and epidemics. The lessons from resilient communities, countries, institutions and their community driven development programmes need to be disseminated, to increase awareness on climate change and coping mechanism to deal with future hazards. Therefore flood recovery should be seen as an opportunity to strengthen DRM mainstreaming, and to promote a safety culture while the memory is still fresh in the coming years.

C. Institutional reform

Medium-term(two years)

- **Enhance DDPM's authority and capacity:** For the middle to long-term perspectives, DDPM should be the central and official coordination body for DRM. DDPM's role therefore, will need to be enhanced so that they are able to manage future large-scaled disasters. Perhaps raising DDPM's legal setting in Thai governance system, at Ministry level, or an organization directly attached to the Prime Minister's office can help in enhancing its authority. This is the case for numerous countries such as Indonesia, Malaysia, Japan and the Netherlands. This will justify the need of enhancing DDPM to be a much powerful national coordinating body. To do so institutional capacity building, collaborating with others, as well as investing in operational and program resource will be necessary.
- **FROC:** In case of mega disaster such as the current flood, establishment of FROC-like organization would be necessary. As seen in many disasters from many countries, overwhelming scale of disaster needs international and cross-governmental cooperation and collective decision-making. The current FROC strategy is already kept under constant monitoring and for catering to the rapid changing recovery need. Lessons from FROC will be essential to incorporate in the planning process and implementation policies such as SNAP and NDPMP and also for a resilient flood recovery.

- **Institutional clarity:** In Thailand, many ministries and organizations are acting in similar DRM activities as mentioned in the NDPMP. For example, for risk assessment, 12 ministries/organizations/local administration bodies are appointed as implementing agencies. Therefore it is important to clarify their roles and responsibilities with regular coordination and reporting mechanism.²²

Long term (five years)

- **Development planning and capacity building:** At national level, although the National Disaster Prevention and Mitigation Plan 2010-2014 (NDPMP) and the Strategic National Action Plan on Disaster Risk Reduction for 2010-2019 (SNAP) prioritise areas for improvement towards a holistic approach for disaster risk management. However, the plans are fairly new and need time as well as tactic roadmap to be translated into sectoral and local actions. At local level, disaster risk management components were incorporated into local development plans. However, without the support of a clearly defined operational and implementation plan in place, local disaster risk management is almost dominated by emergency response and recovery. The prevention and preparedness aspects are fairly weak and likely to be marginalized rather than mainstreamed. Government institution such as DDPM and BMA needs to invest in staff and resources and enhance partnership opportunities to address all aspects of disaster management cycle. Therefore training and capacity building on disaster management should be incorporated in future planning. A systematic review of training needs should address this issue.

- **Revise DRM policies:** Thailand has a sound legal foundation for emergency management. However, the laws and regulations need to be further harmonized and interpreted. The Disaster Prevention and Mitigation Act 2007 (B.E. 2550) and other relevant laws and regulations provide a useful framework and guidelines for emergency management including recovery. The system for disaster management is seen as highly complex in practice, requiring integration of related governmental agencies, defence, NGOs, private sector and civil society to work effectively. The lack of clear operational procedures and fragmentation of roles and responsibilities often led to ad hoc responses and resulted in inefficient and untimely interventions, especially when it required coordination among different agencies, e.g. the delayed activation of the Disaster Prevention and Mitigation Act (until October), and the absence of timely and accurate warning information needed by at-risk communities.

- **Restore Accountability and transparency:** While the floods have mostly brought the people of Thailand together, there have been issues with confusion and conflict. The institutions and communities may have disputes with each other regarding environmental resource management. How relief and recovery funds are administered may also create tensions and rifts, especially if aid is seen to lack transparency and favor particular groups over others. Information campaign and institutional reforms should therefore continue as a longer-term practice.

D. Disaster Risk Financing²³

Medium-term (two years)

- **Assessment of the fiscal risk associated with natural disasters, as part of the broader fiscal risk assessment strategy.** This would require a detailed analysis of the explicit and implicit contingent liability of the state associated with natural disasters, including the development of probabilistic catastrophe risk models for major perils such as earthquakes, floods and tropical cyclones – including detailed risk mapping from an insurance liability point of view. Developing such a risk model for major perils (including floods) usually costs around 60mIn THB.²⁴

²² National Disaster Prevention and Mitigation Plan, B.E. 2553-2557 (2010-2014), DDPM, p 83

²³ This section is written by Luc Vaillancourt, World Bank, for the PDNA main report.

²⁴ Highly dependent of the exposure database already available.

- **Financial management of the budget** volatility associated with natural disasters. In particular, the short term spending needs in the aftermath of a (future) disaster should be carefully estimated and any potential liquidity gap should be managed through retention (such as reserves and contingent credit) and risk transfer (such as (parametric) insurance).²⁵ A program to develop an improved disaster risk financing strategy would normally cost around 12mIn THB.

Long term (five years)

- **Development of an insurance program for public assets.** Natural disasters, and particularly floods can affect public buildings and infrastructure. The government could identify and prioritise critical public assets and develop a catastrophe risk insurance program for those assets. This would ensure that funds would be immediately available post-disaster for their rehabilitation and/or reconstruction. This strategy could rely on either the placement of a group insurance policy for the key public assets or (ii) the establishment of a dedicated fund for the insurance of public assets. Developing such an insurance program would normally cost around 12mIn THB.
- **Promotion of the property catastrophe risk insurance market for private dwellings and SMEs.** The property catastrophe risk insurance market is still under-developed in Thailand. It is estimated that less than 1 percent of the private dwellings are insured against natural disasters, and particularly floods. The government could support the development of a property catastrophe risk (re)insurance pool, allowing the domestic insurers to pool their catastrophe risks and access the international market with a single, more diversified portfolio when it is the most efficient. The government could support this program by providing (i) technical assistance to the private insurance industry for the preparation of this program, (ii) a line of credit to the newly established pool during its first years of operations to help it retain some risk, and (iii) reinsurance capacity of the last resort, beyond the private reinsurance layer, to cover extreme losses. The government could also assist the private insurance industry in developing new delivery channels to increase the property catastrophe risk insurance penetration among the homeowners and SMEs. Based on international experience, there may be a need for some compulsion to generate a stable and large enough business for the pool. In Turkey for example, earthquake insurance is compulsory for urban homeowners. One could also explore compulsory catastrophe risk insurance policy for mortgages. Assumed costs are 30mIn THB for the design of this catastrophe risk insurance pool (including operational manual), and a 1.5bn THB line of credit from the government, to back a total of 3bn in the pool. No other cash injection from the government is assumed at this stage. Note that these figures are very rough estimates that will need to be reviewed during the design stage.
- **Promotion of agricultural insurance.** Farmers are particularly affected by the floods. Building on the ongoing rice insurance pilot program, an agricultural insurance pool could be developed for the agricultural sector.

²⁵ Existing government planned spending on the current flooding is still emerging, but includes about 20bn THB for disaster relief scheme of households (5K THB each), 40 billion THB (US\$1.3 billion) under the agricultural disaster relief scheme (2,222 THB per rai), up to 230bn THB of grants/write-offs to the financial sector, 5bn in energy subsidies, an unknown amount of corporate tax rebates/holidays, and the list surely goes on.

Summary of DRM Needs and Recommendation

A. Strengthened communication and risk awareness	
Short-term needs	Recommendations and suggested activities
Continue needs assessment	As flood situation still prevails, damage assessment should be continued to understand the total scenario
Communication strategy	Communication strategy especially with media and inter governmental agencies needs to be improved to avoid causing confusion to general public for any future disaster and also to disseminate compensation and recovery policy information on 'Build Back Safer' campaign for resilient Thailand.
Medium -term needs	Recommendations and suggested activities
Mapping resources and capacity assessment	- Mapping all available resources amongst all stakeholders, government agencies from region to sub-district level, defense, private sector, NGOs and civil society institutions for better disaster response and preparedness
Integrated early warning system with multiple hazard mapping	- Integrated and improved coordination among agencies concerned with early warning functions to look into multi-hazard scenarios - Mainstream media, informal and formal communication channels for consistency and accuracy of information. - Invest in forecasting and equipment
Comprehensive assessment of 2011 flood event	- Socio-economic and scientific assessment and analysis to be widely exercised with collection of gender disaggregated data, to draw findings and lessons. - Engage with academic and research institutes, think tanks locally and internationally
Information management	- Enrichment of "Desinventar" as proposed by DDPM. Data collection of past disasters are facilitated and installed in <i>Desinventar</i> system, so that it can perform fully as disaster data warehouse. - Computerized and efficient logistical system developed warehouse management including tracking systems of relief goods, external aid acceptance, etc. - GIS system at local level to track resources and capacity
Long-term needs	Recommendations and suggested activities
Risk assessment of climate change impact	- Climate change impacts are assessed together with multiple hazards and incorporated into various development plans, including integrated town and country plan
B. DRM Mainstreaming	
Medium term needs	Recommendations and suggested activities
Separate policies for urban and rural recovery	- Compensation policies should consider the urban and rural aspects. - Urban recovery is more complex and need BMA to share their lessons with DDPM and provincial capitals.
Community Based Disaster Risk Management (CBDRM)	- Increase training budget - Organise exchange visits across villages, sub-districts, regions, overseas, etc. - Promote incentives and awards for volunteers and communities - Increase number of trained volunteers both men and women - Increase partnership with multiple stakeholders to cover climate change adaptation issues and urban communities - Introduce conflict resolution and community development training
Non structural measures to incorporate any and structural measures	- Participatory decision making at all level and at all stages of DRM - Participatory environmental impact assessment, conflict resolution - Multiple hazard mapping during planning new infrastructures
Evacuation Strategy	Set up urban and rural evacuation strategy, looking into community needs by incorporating resilience measures to critical infrastructures and also by engaging grass-roots agencies, defence sector for enhanced security and local community in the planning and implementation process.
Long-term needs	Recommendations and suggested activities
Safety culture	Awareness raising events and lessons sharing workshops within provinces, communities and institutions and also exchanges of good practices from other countries

C. Institutional Reform	
Medium term needs	Recommendations and suggested activities
DDPM's leadership and capacity enhancement	<ul style="list-style-type: none"> - DDPM legal status is upgraded - Enhance coordination role both within the government and with outside stakeholders - Increase resources and budget - Train staff internally and externally on climate change, conflict management and DRM - Develop strategy to work in urban areas, especially those prone to regular hazards - Create database and set up information management system - Compile hazard maps from all sources - CBDRM activity to cover all high risk urban communities -
FROC like arrangements for mega disasters	<ul style="list-style-type: none"> - Set up strategy for taking rapid actions in the event of any future large-scale hazards - Lessons from FROC will be essential to incorporate in the planning process and implementation policy such as SNAP and NDPMP
Engagement of grass-roots and private sector organizations	Grass-roots organizations, representing vulnerable and marginalized population, both men and women's groups and private sector are engaged in recovery planning, implementation, monitoring and evaluation processes.
Integrated coordination system	Train staff from all government sectors on DRM mainstreaming Manual preparations for all concerned agencies for better unified incident command system
Information campaign	Inform about the compensation policies, hazard awareness and safety messages, to restore people's confidence to 'build back safer'
Long-term needs	Recommendations and suggested activities
Disaster management capacity building, Institutional capacity building for longer term planning	Trainings on multi-hazard disaster management from national to community level Emergency response and preparedness capacity building for communities, ERT, OTOS and civil defence volunteers, Allocate resources Train staff Mainstream DRM
Revise DRM policies	Revise policy based on the lessons learnt, train staff, implement DRM policies such
Restore accountability and transparency	Civil society and media engagement for consistent information strategy to raise public confidence for longer term recovery
D. Disaster Risk Financing	
Medium -term needs	Recommendations and suggested activities
Assessment of the fiscal risk as part of the broader fiscal risk assessment strategy	A detailed analysis should be conducted which takes care of the explicit and implicit contingent liability of the state associated with natural disasters, including the development of probabilistic catastrophe risk models for major perils
Financial management of the budget volatility associated with natural disasters	The short term spending needs in the aftermath of a (future) disaster should be carefully estimated and any potential liquidity gap should be managed through retention and risk transfer.
Development of an insurance program for public assets	The government should identify and prioritize critical public assets and develop a catastrophe risk insurance program for those assets.
Promotion of the property catastrophe risk insurance market for private dwellings and SMEs	The development of a property catastrophe risk (re)insurance pool should be supported by the government, allowing the domestic insurers to pool their catastrophe risks and access the international market with a single, more diversified portfolio when it is the most efficient.
Promotion of agricultural insurance	Building on the ongoing rice insurance pilot program, an agricultural insurance pool could be developed for the agricultural sector.

Annex I - Acknowledgement

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Annex II – Scope

This report is produced based on the PDNA consultant's TOR. The PDNA exercise led by the Ministry of Finance, Royal Thai Government and the World Bank was conducted from 7th November 2011- 25th November, with a week long field visits in the selected flood affected provinces, Phitsanulok and Nakhon Sawan and also Bangphlat district in Bangkok. The PDNA field assessment team were mainly focusing on the institutional framework and community level risk management practices. The methodology developed by the PDNA team was used as a guide during the field visit (Annex III). Additionally, the lessons, cases and notes from the field are all captured in this report for future reference and programming for UNDP.

According to the PDNA consultant's TOR, the outputs of this report are:

- An overview of the institutional framework for Disaster Risk Reduction and Management and its operation during the floods
- Status of disaster risk management in the affected provinces
- Recommendations to institutionalise and mainstream disaster risk management in the recovery and reconstruction programme and into development processes in the state
- Recommendations for community level flood adaptation measures
- Recommendations for UNDP's work on post disaster recovery in the area of disaster risk reduction

Annex III - Methodology

PDNA Thailand floods: Format for CBDRM and CBDRR section

Focus Group Workshop Agenda

Time 1:30 hours

1. *Introduction (5 min+10 min) Why are we here?:*
Kwan, Rumana, Sek, Yang Fang introduces themselves and then the participants introduce themselves (depending on the size of the group-20 min)

To translate in Thai:

'Post Disaster Needs assessment is a joint thorough exercise lead by the Thai Govt. and the international agencies UN+WB. It is done in many countries of the world to understand the overall picture of a large-scale disaster such as the Pakistan floods or Haiti Earthquake in the recent time. In Thailand we are doing the CBDRM part within the PDNA. We are from the Ministry of Finance and UNDP as a joint mission for the WB, Govt of Thailand led through assessment where a team of 92 + people (from govt, WB,UN) are looking into 15 number of sectors, visiting X no. of affected provinces. We are a cross cutting and qualitative assessment team, while many of these sectors have been collecting many quantitative data about the damage caused by the floods. We are trying to understand what impact it had on the Thai people, the authorities and yourselves and how to deal with this in future so that sufferings are minimised. What are your suggestions on how to deal with future disasters better? We are looking for qualitative information such as how to improve the awareness systems, early warnings, who should be doing what etc.

Therefore it would be great to start by telling us your name, who you are representing/where you work and also by telling us your most valuable learning experience or most memorable experience as a result of flood. It would be good if you take less than one min each.'

2. *Timeline of the floods: What has happened as a result of the flood? Who did what in order to respond to the floods?*

Map on the wall should be placed. Flip chart and marker needed to draw the timeline below for everyone to be able to see:

Impact
 What happened in the past and what caused the disaster? ← Timeline → what is the future recovery plan?
 Response

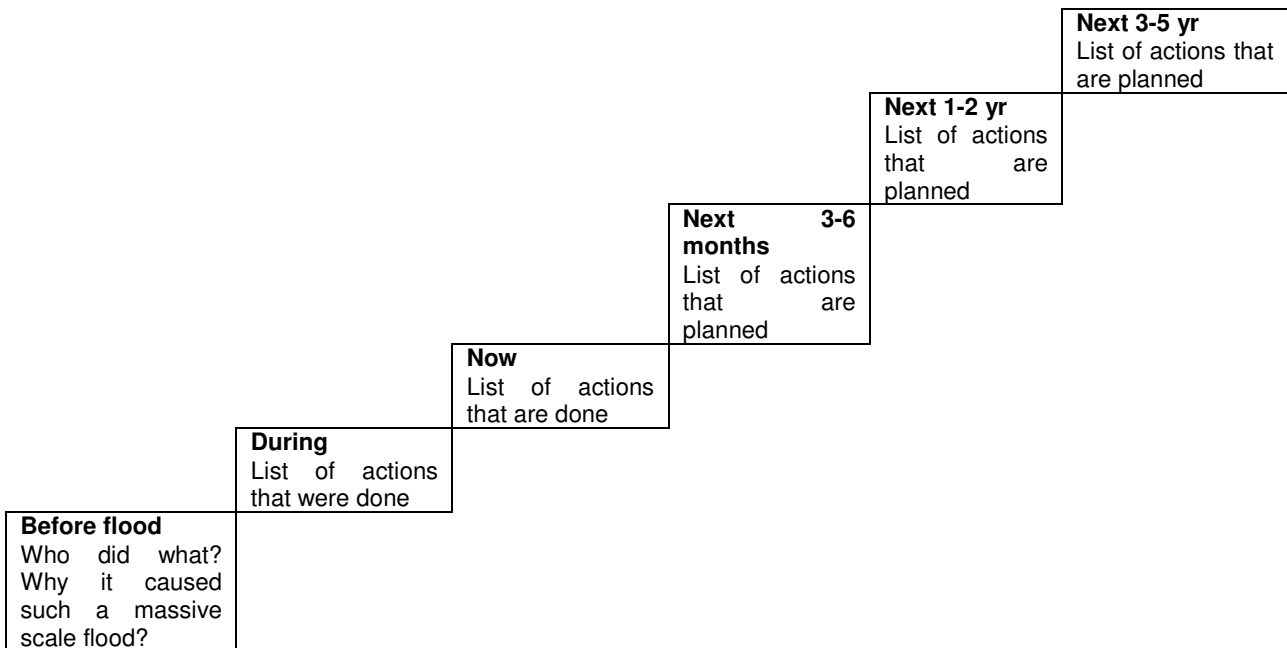
Timeline Thailand Disasters	Impact/ losses/ material and social/shocks and stresses	Responses
<ul style="list-style-type: none"> • What other disaster or stressful event can you remember that you had to cope with in the past? • When did the flood start, what happened before this flood? Show in the map... 	<ul style="list-style-type: none"> • What impact stresses your province have experienced on 20+years)? • What has happened before, after and during the disasters (man made and natural) 	Who did what to support
		Govt
		NGOs
		Community
		Private sector
		Civil Society
		Media
		Military
		Police
		Tourists
Others:		

3. *SWOT analysis and key questions:*
 What are the strengths and weaknesses of the current response? What worked well and what didn't?
 What is the way forward to improve future disaster responses/recovery planning/disaster preparedness and planning?

Strengths: + ve
Weaknesses: -ve
Opportunities: <i>Your vision for future recovery and disaster planning. How to make sure less people and asset are affected? What do you want to learn from other regions or disaster that are happening in many parts of the worlds? What do you want to learn from each other?</i>
Threats: <i>What will be the obstacle to achieve this goal</i>

4. Step ladder/ Action Plan/ Vision:

Scenario planning, what will be achievable and who will be doing what in the recovery effort with focus on CBDRM/CBDRR?



Community Meetings

- Collect cases by talking to Mr. Disaster, community based disaster management committees, if there is any, talk to local volunteers, teachers,
- flood evacuation centre experience, other evacuation places, its quality, flood and other multiple
- hazard mapping exercise, transect walk, to understand how flood started what other hazards and problems exist (manmade, and environmental, both)
- future plan to deal with floods/multiple hazards,
- SWOT analysis with CBDRM committee if they are around and not too busy with relief work, or just talk to them. Vision of community what they have learnt and how they will deal with disaster better in future (long and short terms)-dm cycle..
- If there is a chance to have an organised meeting follow SWOT, Step Ladder Exercise and TimeLine exercise, similar to the Focus Group.

Talk to women, children, schoolteachers, health workers, farmers, community leaders, youth workers, elderly (specially to know the history, if they can remember the big flood that happened fifty years ago) etc. Just be investigative. Find out if the best practice cases from both communities who were part of CBDRM and were not part of CBDRM projects. Find out how much or what type of compensation packages should be most useful fro recovery (immediate 3-6months and longer term 1-3yrs).

Annex III - Case Studies

Case 1: Mr Warning and One Tambon One Search and rescue (OTOS),

Photo left: Mr. Warning, Phitsanulok Province / Credit: Yang Fang, UNDP



In many high-risk villages of Thailand rainwater is measured by 'Mr. Warning' who is trained by the DDPM. One of the remote community in Phitsanulok province, don't even have mobile phone networks. Early warnings rely on 'Mr Warning' (*Mr Tainpai*) usually a community volunteer such as a farmer in this community, who monitors the water level in the river to warn people about flash flood which is faster than the flood due to river overflow in the plane areas. He receives a monthly allowance of 300Baht/month.

Photo right: OTOS truck and the village leader who is also wearing the Mr. Warning hat for the last two years, Nakhon Sawan Province / Credit: Rumana Kabir UNDP



In addition to training 'Mr Warnings' DDPM initiated programmes with fully equipped search and rescue facilities called One Tambon One Search and rescue (OTOS) teams along with Mr. Warning trainings, in some of the selected high-risk villages. These efforts should be scaled up for better preparedness in future.

Case 2: Bangrakam model relief operation centre, Phitsanulok Province



Bangrakam district in Phitsanulok province is situated at the merging point of Naam and Yom River, before it becomes Chao Praya River in Nakhon Sawan province. Bangrakam faces frequent floods and many villages in this area were flooded for three months in this year's flood. Bangrakam has established an operation centre to observe flood water flow, to warn people on the flood situation and to coordinate with various internal and external stakeholders for better response. This is regarded as one of the model operation centres, which the Prime Minister of Thailand also visited recently.

However, the efforts are more on emergency management and early warning. More emphasis needs to be incorporated on preparedness in future.

Photo left/credit: Rumana Kabir, UNDP
Photo right/credit: Kulasake Limpiyakorn, MoF



Hazard Profile: Nakhon Sawan Province has multiple hazards such as flash flood (purple), slow flood due to water overflow (pink), land slide (orange) and drought (green) which was last experienced in 2009 (Photo: Hazard map). Additionally due to the presence of the nature reserve wetland, Bueng Boraphet swamp it was also the source of bird flu pandemic in 2003. There are total 15 districts of which 5 are high-risk to flash flood and the 10 districts face regular inundation. Elevation is 107m above sea level. There are 113,099 communities, 664 villages and 78 sub-districts. So far only 21 communities in rural areas have been trained on CBDRM.

Flood 2011- Cause and Affect: During 2011, the first round of rainfall started from 3rd May to early July, lasting for about a month, affecting 300,000 Rai of farmland and some roads. But the situation wasn't considered very bad at that time, so local government managed to deal with it and repaired the road and the farmers replanted their land. Usually regular rain in monsoon season pauses July to August. However in this year, after just one-month break, another rounds of tropical storm (Nockten on 5th August) and typhoon (Haima) started from early August until November. As a result the farmers didn't manage to harvest in August. So total of 900,000 Rai farmlands were affected which is 80% of the total farm lands in the province. Some houses damaged in the first rounds of rainstorm/flooding were repaired using considerable local relief funds, but were hit again in the second round. Now the provincial is waiting for budget allocated from central government to help with recovery. Usually the rainy season is May and June then a gap, but it was continuous rain this year. September to November was also rainy season and we get flood every year. Day before yesterday (12th November) was the last rain. Additional heavy precipitation exceeded the water containing capacity of the soil quickly. And the discharge of water from upper stream Bhumibol dam further caused the overflow. On the 7th October they released the water and on the 10th October the water level breached its capacity. The Bang Chong Si flood gate in the neighbouring Singburi province, down south was also dysfunctional, which cased the water to stay longer in Nakhon Sawan province. In addition, flash floods in the east hilly areas affected roads and paddy fields for 2 days.

Altogether 65 people in the province died of drowning and electrocution – most were fishing. 10 districts, 78 sub-districts, 113,099 households and 356,912 people were affected.

Reponse and Mitigation: The Provincial DDPM provided CBDRM trainings in 21 villages started in 2008. Community volunteers were trained to observe and measure the level of rainfall for possible flooding and landslide, send out early warnings to villagers and other disaster prevention activities at village level. So far only three villages are trained each year. Last year with more budgets from central DDPM, the village number has increased from 3 to 6. But we are focusing villages facing high risks to landslides according to the Natural and Mineral Resources Department, although these villages in the West part of the province have still not experienced any severe landslides.

This year, when dam released water – messages were given to villages to move assets to upper level of the houses. There were evacuation centres but were not used too much for two reasons – the flooding only last for a short period of time (4 days), and typical Thai houses usually has flooding adaptation functions by design. There are 3 sources of information flow for disaster communication:

1. Provincial DDPM meets with from provincial Irrigation Office and Meteorological Office on a daily basis. Upon receiving flooding alert, they will inform districts to sub-districts along the river, by sending official letters/fax, disseminating messages through community radios, warning notice can be issued from 24 hours to 3 days in advance using fax
2. DPM committees at communities and volunteers in all sub-district areas will keep observing the situation and applying local knowledge and experience to cross-check the disaster information.
3. There are also information flow from upper stream via informal network – people to people telephone and SMS

Other stakeholders involved in flood response are, local chamber of commerce, volunteer groups, and red cross etc. The government compensation of 5,000 Baht is being allocated is seen as a psychological support to help with the lack of income.

Issues and suggestions for future:

- There has been a low compliance for evacuation, partly because the situation wasn't considered too bad – 5 yrs ago a similar floods hit the areas with higher level of water overflow but caused less losses.
 - The focus of the new Disaster Act (2007) is on provincial level, which doesn't support a regional approach of response, while the old 1971 version did. Current one was considered not being able to meet the challenge of a larger scale disaster as such, which required a more decentralized response
 - Centralized response wasn't providing timely support needed - the army was instructed to help with rescue but it was too late until it gets approval from central government. And the ministers dispatched to different provinces by the gov't were not experienced enough to made effective decisions.
 - The change of living style also has an impact, people living here used to deal with water for ages but the younger generations tend to abandon boats but use more cars. There is a need for restore water transportation in the area. And the community awareness to risks need to be further improved
-

Case 4: Resilience/ living with floods



Photo: Ahong Granlert, a 62 years single elderly who lives on her own on nan riverfront, in Bangrakam, a flood prone district in Phitsanulok province/credit: Rumana Kabir, UNDP

'I've been living here next to the river all my life. My sister helped me build this floating house and I have my own boat. Every year I experience flood and this years flood was not much different for me. Except that after this year's flood the students from Volcational College helped me to repair my house. I also got 5000 Baht from the government and a food bag to survive for ten days by the Thai Red Cross. Although I don't have any land to build a house, I am happy where I am and have no intention to move, as flood is a way of life for me. During flood my house floats and I can sustain myself by fishing.'

- Ahong Granlert, a 62 years single elderly who lives on her own on nan riverfront, in Bangrakam, a flood prone district in Phitsanulok province

Case 5: Community confusion

Bangrakam one of the regular flood prone district in Phitsanulok Provnce. The village leader of Wang Koom was telling the assessment team about his frustrations as he felt left out both from the higher authorities and also from his own community.

'During flood we had problems with sanitaiton, when flooded we raised the water reservoir but could not move the water pump as its too heavy to move. Everyone decided together on the responses via the village committee. Five years ago we were flooded for seven months and took bank loan. We have 10 community volunteers, 3 men, 7 women who are mainly health voluneteer. Sometimes there are conflicting ideas amongst the volunteers and so I would like to find more new ones. I had the idea to raise my area with sand bags in future. I did everything myself and was accused for corruption by my own people. I got sand from the subdistrict, airforce helped me with the bags. I made reports of the products but still got accused...'

Case 6: Evacuation Centre, Bang Plat district, Bangkok, 21st November 2011



'In the beginning three schools were selected by the district office for evacuation centers. Twelve more teachers and myself volunteered to help with the preparation work within a week. We expected around fifty evacuees, but the number jumped to 250 people and then the downstairs got flooded. So we had to move the kitchen and the elderly and disabled people upstairs. The water pump got damaged and was under the floodwater. I had to pay for a plumber from my own pocket. The whole district got flooded, including the school. People were asked to relocate to another center outside Bangkok, but they did not want to leave their community. We arranged the classrooms for families and the neighbors they know to stay together. Sometimes we also separated women and men. In one room we had to accommodate 20 adults, 10 children including this newborn girl, who is nearly a month old and is has been named 'Water (Naam)'.

– Head teacher, a School-turned evacuation centre in Bangkok²⁶

²⁶ Field visit, Bangphlat district, Bangkok, 21st November 2011

UNDP Internal Report on DRM-PDNA, November 2011 Email: rumanakabir2003@yahoo.co.uk kwanpadh.suddhi-dhamakit@undp.org

Annex IV - Field Notes

Meeting 1: Director of Training, DDPM Nakhon Sawan

Time: 11:00am -12:30pm, 14 November Monday, Venue: Provincial DDPM Nakhon Sawan

Disaster impact and hazards

- First round of rainfall started from early May to early July, lasting for about a month, 300,000 Rai of farmland was affected. But the situation wasn't considered very bad by then.
- Usually regular raining in monsoon season stops from July to August. However in this year, after just one month break, another rounds of tropical storm (Nockten) and typhoon (Haima) started from early August until November. Additional heavy precipitation exceeded the water containing capacity of the soil quickly. And the discharge of water from upper stream dam (Bhumidol) further caused the overflow.
- Some houses damaged in the first rounds of rainstorm/flooding were repaired using considerable local relief funds, but were hit again in the second round. Now the provincial is waiting for budget allocated from central gov't to help with recovery.
- Due to the torrential rain, farmers didn't manage to harvest by the end of august. Altogether there were 900,000 Rai, nearly 80% of the local farm lands affected by the flooding.
- Altogether 65 people in the province died of drowning and electrocution – most were fishers. 10 districts, 78 sub-districts, 113,099 households and 356,912 people were affected.
- In addition, flash floods in the east hilly areas affected roads and paddy fields for 2 days.
- In addition to flooding, other types of hazards in the area include drought faced by higher ground – Nakhon Sawan was considered source of the flu in 2003

Responses and Mitigation

- The Provincial DDPM provided CBDRR trainings in 21 villages started in 2008. Villagers (volunteers) were trained to observe and measure the level of rainfall for possible flooding and landslide, send out early warnings to villagers, and other disaster prevention activities at village level. With more budget from central DDPM, more (from 3 increased to 6) villages facing high risks to landslides were trained per year.
- When dam released water – messages were given to villages to move stuff to upper level of the houses. There were evacuation centers but not used too much for two reasons – the flooding only last for a short period of time (4 days), and typical Thai houses usually has flooding adaptation functions by design.
- There are 3 sources of information flow for disaster communication:
 - a) Provincial DDPM meets with from provincial Irrigation Office and Meteorological Office on a daily basis. Upon receiving flooding alert, they will inform districts to sub-districts along the river, by sending official letters/fax, disseminating messages through community radios, warning notice can be issued from 24 hours to 3 days in advance (??).
 - b) DPM committees at communities and volunteers in all sub-district areas will keep observing the situation and applying local knowledge and experience to cross-check the disaster information.
 - c) There are also information flow from upper stream via informal network – people to people telephone and SMS
- Other partners including local chamber of commerce, volunteer groups, and red cross also contributed in response to the flooding.
- Compensation of 5,000 Baht is being allocated, but most seen as a psychological support to help with the lack of income.

Issues and suggestions for future

- There has been a low compliance for evacuation, partly because the situation wasn't considered too bad – 5 yrs ago a similar floods hit the areas with higher level of water overflow but caused less losses.
- The focus of the new Disaster Act (2007) is on provincial level, which doesn't support a regional approach of response, while the old 1971 version did. Current one was considered not being able to meet the challenge of a larger scale disaster as such, which required a more decentralized response.
- Centralized response wasn't providing timely support needed - the army was instructed to help with rescue but it was too late until it gets approval from central government. And the ministers dispatched to different provinces by the gov't were not experienced enough to made effective decisions.
- The change of living style also has an impact, people living here used to deal with water for ages but the younger generations tend to abandon boats but use more cars. There is a need for restore water transportation in the area. And the community awareness to risks need to be further improved

Meeting 2: Chief of Watsai Sub-district Office, Muang District
Time: PM 14 November Monday, Venue: Sub-district Office of Watsai

Photo: Watsai sub-district chief/ Credit:Yang Fang, UNDP

Disaster impact and response

- Water came in two ways from the national park and river (?) that blocked the road. Challenge is the area has limited waterways for the water to discharge.
- For the past 2 years, there have been 3 floods
- A sandbags wall of 5 km long, 1.2 meter high were set up since 9 September in an attempt to prevent floods, but the scale of the flooding is as big as 1.7 m high and overflow happened on 3 Oct
- Announcements were made to communities on updated disaster situation. However, due to the lack of accuracy available on the scale of flooding, people find it hard to follow the instructions to guide local preparations. Evacuation center announced for the communities was also flooded.
- **The sub-district has more than 7,600 households, and the area is 100% flooded.** Half of the population is urban, another half is agricultural. As compared to the urban residents, farmers were not affected much as the flooding happened to be not in the planting season (May to July?). Farmers who plant vegetables suffer more losses instead. Farmers will receive 2,000 Baht per Rai for affected paddy field, and affected vegetable farmers are eligible for higher amount of assistance ca. 4,000 Baht from Agriculture department.
- Local government office requested for materials support both from district and province offices, e.g. boat, pump and gasoline. But relief materials were either used in upper stream flooding areas or difficult to delivery due to transportation interruption.
- Most of their relief funding was from sub-district's own budget. Given the unsuccessful efforts in floods prevention, the sub-district office thought it will be better to save money from sandbags to meet recovery needs, if similar case happens in the future.
- Villagers do not believe the message received from gov't office, only made judgment based on their local knowledge and experience. Similarly with the provincial DDPM, local office found it difficult to implement evacuation, especially difficult to persuade senior people to leave their homes.
- The local office also has a plan to build a dam of 1.5 meter deep... (???)



Suggestion for future

- As a future priority, it is considered important to make local warning system work more efficiently, with more streamlining processes.
- ***And the flooding shall be used as an opportunity to do training at communities when the memory is still fresh. The trainings should be made beyond community leaders to community members to get more people involved in enhancing community preparedness***
- ***Coordination between urban and rural areas also needs to be improved as the Nuevo riche didn't come forward to help the farming community and were preoccupied to protect their own locality***
- In the 3-yr development plan (2011-2014) of the sub-district, DPM (with indicators) has been included as a component with focus on flooding. The local government has set budget for next year's trainings
- Sub-district office has 3 staff working on disasters. And out of the total 30 million Baht annual budget, 1.5 million was generated from local revenue, 1 million was allocated by DDPM on DPM. There is also a need to further increase the DPM budget and personnel capacity.

Meeting 3: Sub-district office, Baan Ma Gluer, Nakhon Sawan Province

Time: PM 14 November Monday, Venue: relocated sub-district office in community temple

Disaster impact and response

- Sub-district Office is flooded – moved out since September and it is now under repairing after water receded
- Flooding from mid August until now, worse than the similar flooding 5 yr ago, which was, measured at 50 cm, and this year it was 1-2 meter. Rice, sugar cane, Guava most affected
- Sandbags were used to protect houses instead of for riverbank. Before the flooding, local government implemented projects including digging trenches and building earth dikes along the river, costing 300,000 baht allocated from local budget.
- Areas flooded received assistance from province including 150 boats, 14 floating toilets.
- 1,773 households out of the total 2,819 were affected in the area. By early September, first compensation was made to the affected households using local emergency relief funds through government serving banks. List of the affected houses were provided from DDPM.
- 2 deaths from drowning; 1 of the 3 schools damaged and 1 of the 2 health centres affected
- As next steps, the office will start conducting surveys on losses and damage for housing and equipments, as required by Contingency Law for recovery plans to be financed by Ministry of Finance. So far about 200 houses have been assessed by a team consist of a civil engineer, a DDPM staff, the village head, and a community worker.
- 210 DDPM volunteers (out of the 9,000 residents) of which 10+% are women (total district about 2% of the 1 million population are DPM volunteers) received trained 3-5 days by provincial DDPM. Minimum allowance from gov't was provided only for official orders.
- More mutual assistance among farmers than urban residents were observed. And rural residents are more adaptive to flooding by using boat, and with adequate relief support from upper government, private sector and local politicians (relief food etc). No evacuation plan was activated in the flooding areas.
- As to information, official info from province and district was trusted but considered slow. More efficient and timely information updates was exchanged between sub-district offices.
- For houses with weaker foundation, it could be easily destroyed by disasters. In general the building quality control in rural area was loose – no need for official approval of the building. Gov't agency may provide technical guidance upon request but there is NO condition for getting gov't housing assistance. However, those who request a bank loan will need better compliance in building code.

Recommendation

- The area needs to improve floods prevention in the future, including restoring canals to increase waterways from rivers. The suspended provincial irrigation drainage projects may serve the purpose if properly designed.
- Road/transportation system needs to be improved, while houses destroyed by flooding need to be rebuilt. It takes about 100,000 Baht for rebuilding a local house (local income level ca. 80,000 Baht/year), of which 30,000 Baht housing assistance will be provided from the gov't.

Photo top: Meeting with sub-district officers/ Credit: Yang Fang, UNDP

Photo bottom: Baan Ma Gluer sub district office was flooded and the equipments and computers were all damaged although they raised heir furniture's and tables, the water level was too high/ Credit: Rumana Kabir UNDP



Meeting 4: Mr. Pongpanu Svetarundra, Deputy Permanent Secretary, MoF.

Venue: Governor's Office, Nakhon Sawan

Time: 9:00-11:00am, 15 November 2011 Participants: PDNA team and government officials

- All provinces will submit recovery and restoration plan with request for budget to FROC by today - opportunity to share preliminary findings and raise question and get answers
- The needs to recovery are more important for how to prevent future disaster by strengthening disaster risk management plan

PDNA DRM team's presentation:

Response:

Observation 1: Government's compensation policies were put in place quickly and in an orderly way.

Preliminary Considerations: Using recovery and restoration as opportunities to strengthen DRM and streamlining DRM processes, e.g. government assistance provides incentives to encourage people to build back not only better but also safer.

Observation 2: Resources did not match the scale of disaster. Sub -districts and districts were not well resourced and needed to rely on the centralized top-down decision making system that slowed down the process.

Preliminary Considerations: Enhance resource sharing between regional and inter-regional structure. Disaster Risk Management (DRM) policies need consider ways to strengthen regional cooperation between provinces and cross-district, cross sub-district level collaboration.

Observation 3: Communities with stronger leadership and Disaster Prevention and Mitigation (DPM) teams (DDPM volunteers, rescuers and community members) as well as greater engagement of civil society organizations made better response.

Preliminary Considerations: Creation of database to map resource availability across the government, military, NGOs, local organizations, civil society, media, and private sector for more timely and effective response.

Recovery:

Observation 1: Adaptability and resilience is different between rural and urban communities.

Preliminary Considerations: DRM policies and approaches to cater to different needs of urban and rural needs. Example: Pakistan Earthquake 2005 - Urban Rural Divide.

Observation 2: Provinces and local government are assessing losses to put forward recovery plans in a short time.

Preliminary Considerations: Allow time to think of phase-based approach, develop and implement a 6-month early recovery plan to meet immediate recovery needs. And a longer-term restoration and rehabilitation plan (6 month to beyond 1 year) with proper DRM consideration needs, to be developed according to the changing needs of recovery with time.

Preparedness

Observation 1: Risk Awareness and perception is poor, as many communities, authorities and institutions considered Thailand hazard free. Flood was caused not only by rainfall but also by water and dam management.

Preliminary Considerations: Water management structure and command control system need to be more integrated and consider the environmental impacts during decision making by involving sub-district to village level environmental impact assessment, conflict resolution and multiple hazard mapping including both natural and man-made hazards such as flood, drought, communities in conflict, landslide, river erosion, etc.

Observation 2: Forecasting was constrained due to the lack of proper equipments.

Preliminary Considerations: Formal and informal communication channels need to be streamlined.

Observation 3: Lots of experience generated from the field visit by various partners. Policies are in place but it does not match with real experiences of the affected people and other stakeholders (private sector, NGOs, media).

Preliminary Considerations: Conduct more systematic evaluations and documentation to take stock of the experience and lessons learning by engaging institutions such as Asian Disaster Preparedness Center (ADPC), Asian Collision of Housing Rights (ACHR), Asian Institute of Technology (AIT) etc. in order to revisit local DPM plans, which need improvement and adjustment.

Observation 4: Effective volunteer system is in place but disparities in gender balance, capacity and ability to response exists at all levels between regions and provinces. Overall, disaster management efforts are still skewed towards response and less on prevention.

Preliminary Considerations: Greater attention towards training at the local level - Community Based Disaster Risk Management (CBDRM) and sharing of experiences/exchange visits across villages, sub-districts, provinces, and regions, neighbouring countries to learn on adaptability to climate change and preventive measures.

Observation 5: Prevention can minimize loss, but damage and loss is inevitable.

Preliminary Considerations: Prevention should incorporate insurance of assets and livelihood in partnership with public and private sector.

Meeting 5: Focus Group Discussion 1, Nakhon Sawan, 15th November AM,

Introduction/ memorable experience/ lessons

- Chamber of commerce: Incorporation of private sector in response to crisis, and long-term water management planning like the Netherlands.
- Land use planning should be enforced
- Provincial Industry Office: In areas where disasters are usual, Industry sector adopted different preventive measures in response to different types of disasters. But the preparedness wasn't enough for flooding at this year's scale, barriers overwhelmed.
- Contingency Emergency plan doesn't exist – industry estate has proper risk assessment approaches in place

SWOT Analysis

Strength:

- **Immediate response actions** (draining water done quickly, construction of floods barriers and dikes, restoration plan was quickly in place,
- **Information and Communication** (regular meetings assessing situation on daily basis, water level data collected and used to provide early warning, fast information from television help communication among people, monitoring of situation and public communication on regular basis)
- **Management** (quick decision-making, preparedness plan for evacuating people in urban areas, flexibility on moving to alternative measures when the preventive measures no longer work)
- **Cross-sectoral cooperation** (Ability of the public and private sector to cooperate to solve immediate problems, regular meeting involving both public and private sector 7:30-10:30 to handle the situation and future plans; large number of volunteers come and help flooding prevention ,CSO in providing assistance, ability in making use of equipment and resources from different sectors in relief efforts)

Weakness

- **Planning** (Lack of systematic and integrated emergency planning, planning lacks clear mechanism and lacks of shared vision
- **Information and communication** (lack of enough and accurate data and information esp. in determining risks in different areas, rain forecast is not accurate)
- **DRM in development** (No longer-term water management plan, esp. on city planning, distance is too far between water gates, difficulties in predicting water level accurately,
- **Preparedness** (lack of resources, equipments, budget and knowledge, no past experience of this much of water led to lack of proper preparedness
- **Implementation** (certain group of people won't comply with response measure such as evacuations,
- **Community** (lack of understanding to take self-help initiatives in crisis situation,
- **Management** (bureaucratic system is slow and lack of integration between departments, leading slow response from local gov't)

Opportunities

- Opportunity to put in place more **systematic disaster management** approach (Improve efficiency of disaster management and cooperation between different sectors, materialize preparedness plans)
- raise **public awareness** and change attitude of people in getting prepared, accumulate information and experience to respond to next disasters
- **Multi-stakeholder participation** (more involvement of private sector and people, civil society, private sector to be strengthened in their capacity
- **Communication** (quicken information flow, improve communications of the government to general public)
- Long-term **development planning incorporating risk management** (overall city planning, more integrated water management approach; better management to use water to generate electricity
- Avoiding political interference

Threats

- **Transparency** (fear of inappropriate budget use, corruption of politicians)
- **Management** (Bureaucratic system, Integration of roles across gov't agencies, lack of good and responsive decision making processes, command structure lacks clarity and responsiveness, lead to lack of cooperation limitation in rules and regulations often obstruct cooperation across sectors, Budgets constraints of gov't agencies,)
- **Information Management** (lack of database to plan preventive and response measures, lack of equipment and experts in processing data and information)
- **Politics** (cronyism leads to appointment of inappropriate decision maker, conflicts between political parties and competition for power, sincerity and continuity of the government to solve the problem, political conflicts at national, provincial regional and local levels
- **Public and Society** (division in Thai society, inadequate public education and knowledge, lack of disciplined Thai people)

Step ladder exercise / scenario planning:

What should be done and your role, before during and after flood for recovery and DRM. The multiple hazard map of Nakhon Sawan province was presented to remind participants to think of other hazards, not just flood.



DDPM

(3-6 months)

- Rehabilitate (enable the flood victims to live normal life)
- Repair infrastructure such as roads, bridges.

(1 year)

- Strengthen community in preparing for handling disasters
- Formulate operation plan in emergency in each disaster for particular area

(3-5 years)

- Organize warning systems with clear and accurate information covering all areas.
- Prepare essential equipment for prevention and solution.

Agriculture: Planning rice planting system (2 times a year) from Nov-Feb and from Mar – Jul.

Make it a national plan in setting up planting system.

Those who do not comply with the plan should not get help in case of flooding.

Before the planting season, there should be public meeting among farmers and government officials to have the same understanding about the goals (and time frame).

During the flood, people should be encouraged to plant their crops without soil.

Sub-district/ OBOTOR

Before flooding: Publicize information about the tendency

During the flood: Construct dirt embankment (barrier) and sandbags in the area prone to floods. Find out about the need of the people for boats, consumption goods, coordinate with agencies providing relief supplies.

After the floods: explore the affected areas for recovery and reconstruction

Short-term plan (1 year): set up a system for draining in the area such as installing pipes and digging canals

Long-term (3-5): cooperate with the government in implementing a project to solve problems in the future. Encourage people to build high houses

Ministry of Commerce

3-6 months

- Survey damages of entrepreneurs; brainstorm in developing measures; provide assistance for entrepreneurs; and find ways to prepare for the next disaster
- Provide necessary goods for the people such as consumer goods, furniture, construction for sale to affected people.
- Provide assistance in terms of remedy for entrepreneurs, building morale.
- Promote entrepreneurs to reopen their businesses as soon as possible.

During floods

- Monitor to ensure sufficient quantity of goods for the people
- Coordinate with the producers to make sure there is no shortage of goods
- Provide consumer goods to sell to the people in fair prices

Police

The government and the global community must realize the importance of disasters by developing treaties or international laws requiring all countries to be prepared, not to wait to solve problems.

The cause is that water cannot be drained to the sea fast enough. Next times there will be more and shelters should be built in advance. Choose appropriate places and we have to assume that it will happen.

Irrigation Department

Before Flooding:

- Monitor the situation, collect data
- Give warning about water levels
- Make water barriers (dirt)
- Prepare to move belongings

During the floods:

- Evacuate to high areas
- Repair broken dikes
- Strengthen dikes
- Try to find way to drain water from the flooded areas
- Install water pumps and water channels

Present time

- Survey flooded areas.
- Causes of floods.
- Flow of water
- Drainage system

Chamber of Commerce

3-6 months

- Implement as planned
- Try to find ways to evacuate in the case that the situation is worse than expected
- Form groups to seek prevention at the community level

5 years

- If possible, (we) should move to a safe place
- Prepare for a worse-case scenario
- Transfer risks in terms of careers, location, and income generation
- Build a safe house to prepare for disaster
- Set priorities in solution when facing disaster

Before Flooding

- Insurance
- Build dikes
- Find prevention tools
- Plan to evacuate effectively
- Seek information and analyze possibilities to prepare for
- Check list prevention measure
- Make plans to tackle floods
- Store essential goods
- Create measure to control prices of goods
- Monitor trade situation and quantity of goods in the market
- Give advice , information for the people and entrepreneurs
- Management of consumers goods for flood victims
- Create cooperation among entrepreneurs in preparing to provide assistance to affected people

During the flood

- Solution to prevent water to flood the house area
- If the water is higher than 1 meter they should evacuate
- Search for information in real situation
- Store sufficient supplies for subsistence

Present

- Restore to go back to the previous condition
- Adjust different things to prepare for the next flooding

Meeting 6: Bangtangai sub-district officials. Time: 2:30pm, 15 November 2011

Participants:

- Deputy Mayor of the Sub-District Council
- Head of DDPM volunteers in the sub-district
- Mr. Disaster
- Public Relations Officer

Profile: 7 villages, 1,800 households and 6,800 people. 30% settlements and 70% paddy fields damaged,

Cause of flood: Canal too shallow – plan to rebuild water barriers & dikes

2 things to improve:

- a. rebuild and lift the road to higher level to protect city ;
- b. water came from big river, need a big project to clear the canal

Two Phase flood: First flooding came in early September, received info from local network not too serious

Breach dikes – use sandbags to build a barrier along the river using 3-4 days

Flooding in Oct was more severe, lasting for 20 days

Ping river – silts deposit along the banks, block the water slow

In harvest season, use watergate to direct water into irrigation channels

All sub-districts in upper stream built barriers along the river, so when there is a breach causing faster overflow in downstream

Warning system: First Broadcasting by radio, announce to villages by cars using speakers, ask community to fill sandbags and build barriers, 2-3 days before the second rounds of flooding. Warning system wasn't very help to farmers as it does allow them to do harvest and relocate animals

Good cooperation in the community: sandbags were put around paddy fields and some crops are saved. Sub-district help mobilize ppl to fill sandbags protect district facilities including hospital upon request. Borrowed 2-3 boat from another municipality and sub-district to help the 1 village to which road was cut off by the floods.

Food, water, health support, some DPM contents merged with local development plans.

178 volunteers including 6 women, 50-60 were active, 4 people stand by normal time and for 24 hours in event of crisis. There is also a **search and rescue team** of 10 people work across sub-districts, trained and have capacity to deliver help to people in need of help.

Volunteers receive 1 days training of early warning, evacuation, siren on car.

Better preparation – no expertise, guidance, proper equipments (boat and life-saving vest) with limited budget, trailers,

Possibility to share resources among sub-districts

Half of the volunteers need more systematic trainings

One Mr. Disasters selected by community and appointed in disaster prone areas (case study on Mr. Disaster)

Only 10% of officially recognized as DDPM volunteers – got 120 Baht per day for a week for their support to flooding response.

Women have primary or secondary education. They travel at least 30 min to access to public services – during floods the village roads was cut off by floods and sub-district use boat to send water, food, medicine every day, running shops, taking care of children, elderly and the disabled in the community, undertake the preventive work – filling and carrying sandbags et. Housewife, rely on husband collectively running shops, health assistant,

Interested in disaster insurance – there was once a pilot project but not up-scaled.

Most on loan from local agricultural bank/cooperative banks and village funds - a micro-credit funds managed by community

Hope to get more training on community preparedness and care,

Information from Met Bureau or provincial government hard to get to community in a understandable way.

Meeting 7: Womens' meeting, Ban Klongbo, Tambon/Sub-district Bangtangai, Banphotphisai District, Nakhon Sawan, Time: 5:00pm, 15 November 2011

Participants: Ms. Intira Hasinsub (TAO Representative), Ms. Lad Phanthamitra, Ms. Suksan Imchuyay (Public Health Volunteer), Ms. Namoi Srith, Ms. Samran Chantha, Ms. Yee Phantamitra (shop owner). A seventy-year-old woman, also joined the meeting. From her experience, this area has not experienced severe flood in the past. Meeting venue was in one of the two shops owned by the women.

Their **priority** is road access, as the flood cut off communication and access to market and hospital, when children got ill. Instead of a 8 km route, they had to take 30km longer route during the flood. So the Orbortor/sub-district sent the health workers in the village almost every day for a month, until the water receded so tht the elderly and disabled are better cared. No paved road for the village mean also mean that the children face difficulty to go to school, as one woman explains,

'We've been asking for a paved road to the village, as our children cannot wear socks on the way to school, as it gets very dusty. They have to take thirty minutes motorbike life to go to school and then wear socks after reaching there. Neighbours who own motorbike helps to give rides to the children.'

Women's roles: The women volunteers who are responsible for checking the medical supplies in the village. Every village has a health centre stock, which is looked after by a designated health volunteer, who are usually women. Khun Ming/ Ms. Suksan Imchuyayu is a health volunteer at the sub-district health centre. There were minor incidednt like sore throat and cold during flood.

There are only two trained DDPM women volunteers. Health volunteers received training from sub-district health centre and support the community in times of crisis.

'The village head assigns roles to monitor the overall situation and everyone coordinated well with eachother during flood. We were fighting for three days with filling in the sand bags and water was still rising. In the end we had to give up. Sixty years ago the community centre building was built, where the elderly and disabled were the first ones to be evacuated. Luckily it was school holiday so classes were not disrupted.'

Lessons from flood 2011:

Preparedness:

'Although we stayed at the evacuation centre this time, its only 30cm higer than the ground level and was not flooded this time. But this may get flooded in future. No houses were destroyed, but were all surveyed in a very transparent way. Last month (14-15th October) in a village meeting the government officials came when the water was still there. Rice farmers are also getting compensation. We have underestimated this years flood, compared to our past experiences. Next time we are not planning to fill in sand bags but will work on making a raised road, so that it's not flooded.'

Awareness: Not only the volunteers, women are more interested to learn about early warning, evacuation etc. and get more knowledge.

'We think its difficult to plan as the weather is unpredictable these days. For example, El nino, we don't know what it is, what's the future weather will be like. Our children in the school are not taught on these issues. We heard about el nio and lcimate change issues from watching TV and listening to the radio. We all have access to mobiles. We can get instant messages on sms and this is good to keep contact with the outside world.'

Finance: *'We've heard form the bank of agriculture and cooperative that they will introduce a system of insurance both for life and crops. We don't have any assets or savings. But can take loans from the village fund, which is managed by us (community development –ministry of interior???) Debt moratorium from bank of Agriculture and cooperative because of flood.'*

Meeting 8: Head of Sub-district, local council members, village head
Venue: Kevi-Chai sub-district Office, Chum Sang District, Nakhon Sawan,
Time: 10-11am, 16 November

Other hazards: severe storm 15yrs ago. Last year also faced a storm. This year, March to May, four houses got destroyed. Drought was faced two years ago and it is manageable.

Cause and affect of flood:

'We consider this disaster man-made as the canal should have been working. All the provinces are making their own barriers and dams to keep water out. So this flood is both a natural and man-made disaster as we tried to force the water against its natural flow.'

- Typhoon Haima in July, another typhoon in August, water started coming to sub-district since 12 Aug and didn't recede.
- Along the river Nan and Yom/Yong?? there are earth dikes about 1m high. Sandbags extra 70 cm was added to prevent floodwater.
- Rains came half a month earlier in March.
- Illegal logging in the Northern parts of the country also causes the water to flow down faster.
- There was a big ship carrying sugae near Ayuthaya? that sunk. So they had to stop the flow of water to rescue the ship. As a result the level water was rising.
- Spatial planning: In Chum Sang district the houses are built on ground these days, which also are blocking the flow of water.
- Dam water was not released on time despite of the met office forecast of rain. Water was only released last week (early November) after two months of waiting.
- The transition government failed to make proper arrangement for water mgmt – e.g. release water in the dam to allow more water containing capacity, with the forecast of more rain
- Water logged for 2 months, just receded last week.

2760 households and 8000 people affected. 30% of settlements and 70% of farmland affected, majority rice (80%, rest are mango and corn). Fish farms also were inundated. Farmer didn't manage to harvest, as the floodwater came early. 100 people got snakebites, electrocuted and diarrhoea and 2 people died. Total 200 volunteers and half are active. Men women both are engaged in farming. 68 health volunteers. 1 agriculture volunteer per village. DDPM volunteers overlap these roles and also train the police on trafficking.

Response and lessons from 2011 flood:

'We spent two million bat on sand bags out of the sub-district budget. The neighbouring Sub-districts didn't cooperate, so we couldn't protect our sub-district in the end. The neighbouring sub district was saying- if its flooding then let it flow, so you see, there is a difference in our mentalities and that's why we couldn't come together to make a collective decision. We sent letters for warning and radio broadcast. Community filled in sand bags and repair the flood barriers. We have a plan to repair the flood walls in future.'

DPM plan as part of the local development plan, on measures to be taken to prevent floods and post-disaster response dyke repair, floodwall and infrastructure/road works.

Response: Heads of villages coordinate with sub districts to get help in event of a disaster, A truck from sub-district, three engine boats from district DDPM, relief bags from Red Cross were provided for relief efforts. Village health volunteers assessed and facilitated people's need to see doctors. Food from sub-district, the worse problem is transportation, 10 yrs ago highway authority build a by pass road in higher land, that wasn't flooded and 200 households stayed there in the tents provided by the district office. Floating toilets were provided in the tent settlement. The PM came to visit the 200 houses and all got 2000 Baht compensations.

Adaptation: Mostly traditional Thai stilt house got 2 floors and people have boats. As there wasn't any severe flood in the past, so many sold their boats.

Assessment: For each village two village heads and their assistant comprised a survey team. These assessment teams surveyed 17 villages for 15 days for house damages – 30,000 Baht. Majorities are Thai houses, only 1 house totally destroyed, other partially destroyed. 15% families have boats

Compensation: Rice 2,200 Baht/ Rai, fruit orchard 5,000 Baht/Rai , Crops 3,000 B, fish pond measured by square meter of area. Most farmers are tenants. If they don't have proper documents, the village head supports and certifies for compensation eligibility. Mature compensation system in place. Sub district is now surveying the damage and loss (infrastructure), prepare to submit to district office and province.

Conflict resolution and participatory environmental impact assessment and resource management: The sub-district would like to strengthen floodwalls, but community doesn't want to sacrifice land. Therefore community conflict resolution, participatory environmental impact assessment between sub-districts and participatory watershed management will be required in future.

'The community does not want to sacrifice their land for building flood protection and that's the problem we have now. The two unused old ports were built fifteen years ago, is causing soil erosion on the other side of the river embankment/dyke. So we should remove these ports that were never used.'

Meeting 7: Community Meeting with CBDRM trained Community
Venue: Bann Chom Pu village hall, Chom Pu Sub district, Phisanulok province,
Time: 15:00-16:00pm, 16th November 2011.

Government officials Mr. Kulit Sombatsiri, Inspector General of the region, Ms. Panadda Puanrub, Head of Inspection and Evaluation Bureau and their team from the Ministry of Finance joined the assessment team.

Good Practice of a CBDRM trained community:

This community have experienced sever flash flood in 2007. They have 315 households, 1,135 people, 26 DDPM volunteers (21 female and 5 male) and also police volunteers. They received CBDRM training in 2009, as they are one of the high-risk flash flood prone communities living near the northern mountainous region.

CBDRM features:

- DDPM volunteers work together with the irrigation dept. volunteer (one per village with 500bhat/month expense allocation), health volunteers and the search and rescue teams.
- Practice evacuation drills every year
- Storm preparedness is also considered
- Mr. Warning (*Mr. Tianpai*) gets 300 Baht/month as a salary.
- Evacuation plan is presented in the community centre and even children knows about it, as they are instructed to come home as soon as they hear the siren.
- When the level of water in canal reaches certain level +7meters, it triggers the siren and when its 8m the evacuation plan is activated.
- 4 stations are set up by DDPM to monitor the amount of rainfall from the mountain to the ground.
- Last year 30th August a warning was activated three times with eight hrs intervals. By the time of the second siren people already evacuate as the water comes very fast.
- Rainfall is also measured. If its above 100cm then warning is issued
- 2 boats and life vests are available for search and rescue

Rescue team and car, 26 health assistants (21 female, 5 male) trained by health materials

- Every year DDPM and Health co-organized trainings for the teams

Resilient and adaptation features:

- Typical Thai house, so not to worry too much about the water

Flood 2011 impact and response:

As this community faces regular flash flood, this years flood experience was not severe. Paddy fields and mango orchards were under water for 2-3 weeks. After a month they already started planting rice. Heavy equipments e.g. tractor, got damaged and the technical collage students came to fix and help the community

Need for conflict resolution in the prevention plan:

Irrigation authority plans to build an irrigation network including water reservoirs that will affect the forest resources. Although this will help both flooding and drought across the sub-district, which includes this village, some neighbouring villages are protesting against this together with environmental NGOs due to the concern for loss of income from forest based livelihoods, as they will need to adapt to new jobs and skills.

SWOT analysis:

Strengths:

- Mr. Warning (Mr. Tuanphai) is responsible for providing warning to people.
- We have the village chief to help community members.
- There is a management team in each cluster. There are 17 clusters of households. In each cluster there are around ten households.
- Division of duties, evacuation, first aid and disaster warning
- Harmony in the community, there is a network in warning system
- Have announcement equipments –its used every morning at 6:00 and also to inform the situation in the evening.
- The bank for agriculture and agricultural cooperative has waived loans for the next three years.
- Children get to learn about natural disasters, students learn about evacuation drill and prepare to run home when there is a siren.
- The people get assistance for 8000 Bhat- ‘Mother fund’queen mother charity??
- At the moment we have 80,000 Bhat allocated for village development and recovery in the area and we can decide on how to use the fund.

Weakness/Threats:

- Agricultural area affected continuously.
- In some period there is drought, and some seasons there is flood.
- We could not build dam as NGOs opposed.
- There is no plan to dig the canal deeper. Canals are curve and difficult for water to flow.
- Erosion of riverbank.
- Sometimes flood come fast and strong and sometimes at night, and sometimes there is a mudslide
- Judging from our previous experiences, we predict that next time it might be worst.

Opportunities:

- Evacuation: We should have a space reserved for evac in case of flood as the old space was flooded. The new space should be moved to a school hall in Baan Samlam for evacuation during flood.
- TAO Wangchompoo, have vehicles for evacuation.
- Should have training on natural disaster warning for all the communities



Photo left: Community meeting, at Bann Chom Pu village hall, Chom Pu Subdistrict, Phisanulok province/ Credit: Rumana Kabir, UNDP



Photo right: Sien to warn people about the rising water level in the river, to warn against flash flood in Chom Pu Subdistrict, Phisanulok province/ Credit: Rumana Kabir, UNDP

Meeting 8: Community Meeting with CBDRM trained Community
Venue: Village hall, Chom Pu Subdistrict, Phisanulok province, Time: 17:00-18:00pm.

Government officials Mr. Kulit Sombatsiri, Inspector General of the region, Ms. Panadda Puanrub, Head of Inspection and Evaluation Bureau and their team from the Ministry of Finance joined the assessment team.

CBDRM features:

- This remote community have a different warnings system, as they are more remote and no mobile phone coverage.
- Mr. Warning is a farmer and he observes the water level in the river.
- 600 households, 2000 people.
- Got CBDRM trained in 2009, similar to the first village (See Notes: Meeting 7). After the siren +8m water level in the river, the children come home and community have one-hour preparation time to evacuate.
- This village have 24 volunteers, 5 female. Sub district give them an allowance. Some time not money but some subsidies like rice or food.
- Awareness is good. And this community can be a good model for preparedness.
- Children were taught preventions skills like when they hear the siren, they should run back home and stay in a safe place.
- They should be prepared in the rainy season to store the belongings in the safe place.
- We got support from TAO for relief.
- Good cooperation within the community to help each other.

Structural needs:

- Barrier to slow down the flow of water is needed, as the flash flood water comes too fast.

Non-structural needs:

- Although they are trained in CBDRM, they were not fully equipped with rescue boats and life vests. 'We do not have enough boats, needs four to five big boats, no life jackets.' Mr. Kulit organised boat and life vests for this community to be delivered ASAP.
- When it rainsd heavily, we couldn't hear the siren, which was not loud enough.
- We couldn't catch fish during the flood due to the force of flash flood water.
- It takes two to three months to replant the crops. We haven't had any government compensation yet.
- Lack of planning for purchasing, new TAO was elected and didn't have time for planning.
- We have some budget in the community fund but were not used. Money in the bank but didn't use it.



Photo: Deforestation causes landslide and flash flood in Chom Pu Subdistrict, Phisanulok province, community wants to slow down the water flow / Credit: Kulasake Lumpiyakorn, MoF

Meeting 9: Focus Group Discussion-2, Phisanulok

Time: 10:30-12:00, 17 November 2011

Participants:

Department of Irrigation/dam/urban water mgmt/
Policy Bureau
Industrial Dept
Commercial

Introduction/Memorable experience/ Lessons learnt from flood 2011:

' When I was young water was clear, I could swim in the flood water, forty years later now I see flood to be very difficult as its act of nature. 1995 I graduate from college and started working there was flood in Bangkok but moderate. For me this is the worst experience. Every year the flood is becoming severe and water getting polluted. Politics also polluted the 2011 flood, which is too much but we did manage to save Phitsanulok as the governor and mayor worked very hard together. Maybe human beings are the one who decides the fate of nature'

Water management:

Management of water system of Kwaee noi dam was the cause of flood and had impacted on the lives of people economy and quality of life. Impact of climate change, inadequate management of water, water from outside the province is hard to measure. Lack of facility/infrastructure 2 dams (Sirikit & Kwaee Noi) for Yong and Nan rivers to manage extra amount of water caused by excessive rainfall.

Kwaee Noi in April has reduced to 30% of capacity – quickly reach capacity in August; drought is more difficult to predict than floods

Lack of system to make more accurate estimation/predication of the rainfall

Limited capacity of dam – gov't has plan to build new dams with bigger capacity, but NGOs and communities are against the plan.

Not much difference in 2007 not comparable – due to waterway changes due to city planning and change of land use,

Tropical storms come more concentrated in a few months – no time to response

Water distribution and management project Naresuan Dam: Because the area is low basin, we have to rethink the water management system. The old way didn't work and now there is a lot more water, more than before. We need to think about how to drain the water effectively.

Irrigation office- station 3: in Phitsanulok the overall system is needs to protect the economically profitable areas like irrigation, farms. There are problems in water canals in the Sai Mai which needs to be looked into. We had lack of information on water management.

Climate change indicates clearly the flood intensity, lack of urban planning becomes obstacle for water management. There is no clear planning because here has not been a severe situation like this... There is not enough tools for water management systems. We tried to prevent in one area and ended up flooding another nearby area.

Director of water distribution and maintenance station 3, Plaichumphol – Monitoring of the situation climate, and water condition in order to tackle or to prevent flooding in the irrigated area is needed. Solution should be done in a timely manner.

Irrigation Dept: Related agencies should provide the information about weather forecast. Continuous public relations, is needed as there is no unified centre of information.

Memory: continuous storm has not happened in the past. (Climate change) there was a first storm and after a pause.

Agriculture: Risk data need to be tailor made to meet different needs of the targeted groups – departments and communities. Pilot insurance projects for the corn and rice – villages in some provinces just started, farmers are not interested as they have to register first and complicated procedures to be able to be insured. Gov't will pay for the loss, insurance only announced by gov't as damaged area or not. Main partner - Agriculture bank, Lack of technical tools and capacity assessing damage

Provincial industry: Impact from the flood caused the entrepreneurs to suffer. Not enough raw materials available for production.

Provincial Police: Cooperation of all sectors including the police.

Roads and public works: products stockpiling so that the distributions centres in the nearby provinces are well equipped for future disaster responses

DDPM Province: We need to learn better on communicating information, monitoring river water overflow.

Private sector- chair of chamber of commerce: Flooding is normal here, but this year we had more water. The municipality knows to manage water. Managing water is a problem and long term solution is needed to from north to south, not only thing about our own provinces as its not comprehensive. Private sectors role is important, as government's role is inadequate to deal with the scale of the disaster.

Chamber of commerce, Secretary General- People helped each other in the time of crisis, private sector and people generosity helped to deal with this big flood as public sector and government measures were not adequate. Therefore it is important to incorporate private sector in disaster response and management, especially for water management. For example: In Holland the private sector is involved in water management.

Land use planning is essential and need to be better enforced.

Coordination and collaboration: There must be a good and affective measure to prepare for a situation like this in every agency in terms of pr and monitoring, cooperation between agencies in the area. Affective water management system will help to relieve the problem.

SWOT Analysis:

Strengths

- Good cooperation between agencies to update on information on a daily basis.
- Effective management. Early warning issued and prep meeting at province level.
- Communication system is good, we got information from internet 24hrs a day
- Leader with vision who is attentive to the situation, who understand the problem. Leader well prepared. The executive team have sacrificed their own time. Chain of command comes from one point.
- Readiness of personnel, preparation in advance.
- Water management, irrigation system, water movement and digging canals to make the water flow. There are dams to keep the water, the system is good
- Climate change adaptation: Because of repetitive flooding, farmers adjusted to the planting system, for example: short-term rice was planted to be able to harvest before flood. Changed from farming to fishing. Farmers were able to prepare to some extent that helped them to establish a planting system in some areas

Weaknesses

- Lack of confidence in the information from the main agencies, no compliances or conformity
- Lack of community network
- Different areas have conflict related to water management
- Conservation groups resisting the building of large dams. Invasion of forest. People occupying all the space: Public areas invasion causing difficulty to create canals and water drainage system
- Lack of regulations to support sustainable development -infrastructure blocks water ways and drainages
- Lack of accurate analysis, real-time measurement was not sufficient.
- Not enough assistance for transportation- boat, food and vehicles.
- Poor mental health
- Government officials were overstretched and overworked
- Spatial information and surveillance station in not enough
- A lot of low lying and vulnerable areas susceptible to flooding so flood cannot be avoided.
- Large volume of water was hard to manage, lack of spaces to store excessive water
- Lack of tools and equipment to mitigate and prevent natural disasters, Procurement of water pump life jacket were not enough to match the scale of the need , Weather forecast.
- Lack of police force
- Communication was not sufficient to provide assistance
- Lack of preparation for communication and public consumption
- There is no clear plan of assistance

Opportunities

- Build confidence in information. Have enough databases for the flood. Integration of information together to reduce the damages.
- Educating stakeholders to prepare for future disasters
- Have a clear prevention measure. Make clear plans
- Good warning system. Provide monitoring and warning in advance.
- Prepare irrigation system. Store more water
- Development of transportation system at the community level
- Learn from the current flood to improve future disaster management

- People are prepared to tackle the flood, more alert and are paying more attention to the water situation
- Establish production system to avoid flood season
- Install tools and instruments to provide accurate information and also for water management system
- **Coordination:** Every agency become more cooperative for future prevention. Both private and public sectors should provide tools and equipment for prevention and mitigations-mobile toilets, tents, life vest, water pump etc.
- Reduce conflict between people in the neighbouring areas
- Monitoring of disaster preparation, with food and water supplies, consumption products.
- Some businesses took advantage of the situation and raised prices. There should be a law enforcing them to control the pricing.
- Provide fair transportation system for the flood-affected people in every community.
- Planning: To tackle disaster, we need the related data to be analysed for preparation. Test the equipment and prepare personnel. Recovery: repair and improvement of equipment.
- Long-term recovery: develop tools and equipments

Threats

- Lack of support from communities
- Conflict between people in the areas between upstream and downstream
- Lack of budget and resources
- Inconsistent and unclear government plan
- Government change very often
- Forget about the situation when its over, not enough emphasis on the issues
- Lack of information and no trust in information
- Lack of cooperation between agencies
- Lack of responsible agencies
- Development could impact community and environment. NGOs opposing the dam construction
- Police force was not enough to provide assistance to people during the flood
- The people didn't understand the government objectives to build water reservoir's which they obstructed
- Interventions of politicians interested areas, conflict of interest.
- Cannot plant crop according to the normal season because of climate change
- Stealing and burglaries increases during flood

General discussion: *as some participants didn't want to do scenario planning/step ladder exercise, as they mentioned that they have already submitted their plans to the relevant government authorities.*

Q: What about the other hazards?

Drought is more difficult to predict than floods:

Lack of system to make more accurate estimation/prediction of the rainfall

Limited capacity of dam – gov't has plan to build new dams with bigger capacity, but NGOs and communities are against the plan. Not much difference in 2007 not comparable – due to waterway changes due to city planning and change of land use.

Tropical storms come more concentrated in a few months – no time to response

Q: Which area should the recovery focus on?

Short term recovery:

- Provide relief bags, house repair toolkits and assistance and cash assistance to affected families who are affected by the floods.
- Psychosocial mental health and society should also be prioritised

Long-term recovery:

- Information data base, accurate and reliable weather forecast
- Even if we have tools to forecast the Sirikit dam, its still not sufficient for both the Sirikit and Kwaie Noi dam. We need to take appropriate measure for infrastructure.
- Monitoring-surveillance-accountability should be enhanced
- Preparedness should be prioritised as now the farmers cannot access information and on which time of year to plant. For example, the Prom Pheram community didn't know how much water is coming. We also need some adjustments and adapting farmers behaviours is difficult and also need to educate them
- **Agricultural:** Risk data need to be tailored made to meet different needs of the targeted groups – departments and communities
- **Increase dam's capacity, - Lack of facility/infrastructure 2 dams (Sirikit & Kwaie Noi)** to manage extra amount of water caused by excessive rainfall overflowing Yong and Nan rivers. Kwaie Noi in April has reduced to 30% of capacity – quickly reach capacity in August.

Agriculture: Pilot insurance projects for the corn and rice farmers. Villages in some provinces have just started, but the farmers are not interested, as they have to register first and complicated procedures to be able to be insured. Gov't will pay for the loss, insurance only announced by gov't recently. Not much information available yet. Main partner - Agriculture bank, Lack of technical tools and capacity assessing damage

Managing water is difficult for Nan and Yom River:

Rainfall this year recorded as 1643mm/year. Avg rainfall 1417 (in 12years)???

Q: why did you not drain the water first?

Up stream- volume was beyond control- before the typhoon the by draining the water 30% was reduced in April. In May water came in Phitsanulok. By the end of the month we didn't know how much water will it be

Q: Were there any warning and forecasting?

According to study 300 million cubic meters water capacity of water management system. This year in August 800 million cubic meter water recorded. So it was excessive more than double its capacity for the system to cope with. We should have a 1000 million cubic meters capacity dam, but the environmental groups protest.

Drought:

Outside the irrigated area in the Nam-Yom basin its difficult to manage and we didn't know when drought will end.

Flooding:

Farmers could go fishing during flood. Didn't know when the flooding would be over.

Flooded severely in:

138-1995

149-2006 (five years ago)

154- 2011

Spatial Planning: In 2006 flood the water was similar, but not this much damage. Because now the change of land use is high and multiplied by the infrastructure pressure as the water can't flow downstream. More construction is going on that blocks the floodways.

Rasena University have the tools to measure the data about the dam water level. But we don't know the facts. Many people in the cabinet are arguing without scientific analysis.

Overall factors contributing to drought:

There is an effort to move the water not at their maximum/full capacity

The problem with funding. The amount of rain doesn't vary much but the intensity, pattern of rainfall and frequency, duration varies.

2006-2011 (BE46-54): Storm frequency was not high in 2006.

The environment changed: Taking picture of the forest, land and river, ecology and documenting human resources, quality of life

operation plan: upstream areas- conservation and downstream area -development

Whats the way forward then? Could there be an action plan or implementation plan?

1. Conflict resolution: Conflict of ideas need to resolved from village to village.
2. Environmental impact assessment- if the conservation group protest we need to find ways to plant new trees to avoid deforestation.
3. Need to have a back up plan for future, as we don't have one now.

Challenges:

Short memories: The government have a short memory as they promise something and then forget about it. Meetings but no results: Sometimes we have meetings with plans and flipchart-then forget about ti. All parties are correct in their own opinion

Meeting 10: Bangphlat District Officials, Bangkok

Venue: Bangphlat District Office, Bangkok, Time: 3:00-6:00pm, 21st November 2011

Total population 100,000

Affected communities: 46, affected households 45255, 40 people got ill mainly diarrhea. No death or injuries.

Oct 17th Relief Operation centre set up and Oct 24th the whole district got flooded. Water only receded a week ago (city under water for almost a month). Bangphlat District lies next to the Chaop Praya river basin in Bangkok. Fearing more water due to the high tide during 27th-28th November.

Cause of flood 2011:

Along Chao Phraya river, permanent dykes exist, but certain areas have gaps and weakness points where ppl resist and became breaching points. Second set of barriers, bordering district boundary, system of canals not stopping water – need for building permanent sluice gate in the future
Provinces in north of BKK needs to release water slowly maybe takes months as BMA blocked the water – community/ppl destroy the barriers

- Before floods this year we regularly get affected from Chao Praya river overflow. Flood protection dykes have some gaps as some of the communities living there tried to restrict the continuous dyke building as it runs through their houses, shops, restaurants, parking space, etc. So that was the breaching point for floodwater to enter the district. Private owned properties like parking, restaurants wanted to be in the river front and didn't want the dyke because of aesthetics and business benefit
- Sand bags could not prevent the water coming from the gaps of non-continuous dykes.
- In the big floods 14 years ago,(in 1997) we had same problems as the certain houses could not withstand the flood flow, although the private properties tried to build their own protection walls
- Nonthaburi district boundary has a railway line (5km railway track), which is also a physical barrier for water to pass. The canal systems under the railway serve as natural drainage. When the water level in Chao Praya river got higher we got breaches on the 19th to 22nd October and 24th we had the biggest breach of water
- Water came from both directions. River other side of the district boundary.
- Cooperation and mismanagement at the top level caused further sufferings



Photo: Discontinuous dyke caused of flood in Bangplatt district/ Credit: Rumana Kabir, UNDP

Response:

- Early warning: We have designated people to monitor the water level in certain areas. But not a very scientific or accurate system. Government, TV channels, informal networks were all used
- S&R teams available, but as the operation is of large scale, governments and other provinces sent volunteers. Total 400 volunteers, 200 army, 75 navy, 40 fire and rescuer from other districts were helping with the total relief operations along with civil society groups.
- 28 evacuation centres (11 schools and rest are temples) were set up. 2200 people stayed in the evacuation centres, but many refused to evacuate in fear of robbery in the house. 50% has now moved back. BMA was responsible for food supplies (rice and water were provided) at the evacuation centres. 120Baht/day/person was allocated for food. Either community kitchen or packed lunches were provided. Mostly poor families are living there. (There are around 3000 poor households in the district.)
- Red Cross relief bags were provided. King's and Princess's charity, other stakeholders, NGOs and relief agencies collected their needs assessment data from the district office for their responses.
- Medical services also contacted the district office to offer help.
- Pairing of provinces from non affected parts, such as Trang and another new one came to help.
- Damaged households are all getting 5000Baht compensation including those who are able to show rental agreements. Most damages on houses not businesses.
- The district arranged transport-boat when, they noticed that the private boat owners were coming and overcharging people

Major issues:

- conflicts partly due to insufficient authority of FROC in coordinating with BMA,
- amount of garbage
- capacity to deal with compensation, can't deal with demands, 540 people working with us. For the compensation 140 officials dealing with it seven days a week. So far 10,000 submitted applications for compensation from 10 Nov and we are doing 1,000 cases per day.
- Only benchmark is big floods 15 yrs ago in BKK, underestimation of impact

Future plan:

1-6 months recovery:

- As more than 45 canals (120cm water level) are now full of silt we need to clean them for restoring the drainage systems.
- People are getting a bit dependent from receiving relief. So self-help motivation is needed.
- 1-2yrs medium term recovery: Infrastructure to prevent potential flooding in future by considering the social-economic factors. Chao Praya river basin dyke protection for 6km. Port authority, city-planning dept. under the BMA are responsible for that. We can't really do much from the sub-district office.

Meeting 11: Bangkok Metropolitan Administration (BMA)
Venue: Bangkok City Hall, Time: 3:00-6:00pm, 22 November 2011

Participants: Deputy Director General, departments including fire and rescue, international cooperation, training, drainage and sewage, housing as well as social development

There are altogether 50 districts and 3 parts need to manage the water: East area, Area close to Chao Phaya River, and West areas. 37 districts flooded, 13 not flooded

Main problems faced by BKK:

1. Water from north flowing down stream since September
2. Sea level going up, raining, which all happened at same time, sea level highest from Sep - October, which is the rainy season

Bangkok has its own Disaster Prevention and Mitigation Plan (2010-2014), covering Prevention & preparedness, emergency mgmt, response and recovery. Every province has its own plan with specific risks target, BMA plan covers, fire, toxic, transportation, drought, cold weather apart from the regular natural hazards like flood, drought and storm.

According to the law, BMA can ask for help from other dept of central government. BMA team is also present within FROC since mid October.

BMA has six sub-committees under flood response centre –

1. Technical
2. Evacuation
3. Medical assistance
4. Budget estimation
5. First aid
6. Immediate issues

Budget: Special Administrative Region – revenue of the city. Regular Emergency funds THB 12 million but for not big disasters, not distributed from central government. Collected from their own revenue mainly. Private sector plays a big role too.

Operation: BMA has 2 city halls, operational centres set up (information/call centre, equipment) since 7 Oct.. It was prepared 2-3 weeks before water came to the city.

The 1st Operation Centre has 50 people working in groups: monitoring, call centers, public information, social support – evacuation centres (400+ out of which 185 still running, more than 20,000 people were living in these evacuation centres. About 2,000 relocated out of BKK);

BMA is also starting to collect damage info of infrastructure; live information on water system.

BMA operation centre have these following sections:

1. Public hotline 24 hours request line for boats, drainage sand or for getting general information on flood
2. Radios station to communicate with districts two types - walkie talkies and land lines
3. flooding /disease/ evac –medical response team
4. CCTV monitoring
5. Strategy
6. SCADA website for public relation for both in Thai and English

Photo: BMA operation centre/ credit: Rumana Kabir, UNDP



The 2nd City hall has 20 people working.

Water management:

Formal and informal communication with relevant departments (water, etc), modelling and estimation of amount of water

BMA drainage department responsible for the flood management.4 systems of water management: Dyke; major canals; monkey creeks and pumping stations. Permanent dykes along Chao Phraya river and along BKK boundaries, monkey cheeks, water gates to control the water flow, 6 main underground drainage canals, along the seaside, giant water pumps to channel the water to the sea. The website: dds.Bangkok.go.th provides information on the drainage situation of BMA. Satellite data is also available.

Private sector helped with engineers and equipment.

Immediate Needs:

1. Waste management:: 2 out of the 3 Garbage centres in north and west flooded, only east working, environment dept. Special programme set up to encourage citizens to collect garbage for eggs and rice.

2. Evacuation process: Difficulties to reach people during flood to evacuate or provide relief. Also to have a system for those refuse to evacuate. So far 6 million registered, 5 million unregistered, but house have registered are eligible for the 5000bah compensation.

3. Conflict Mgmt and the intention to protect inner BKK – Addressing the need for coordination with other provinces. Saimai and Pathumthani districts are in conflict with Bangkok. Before flood we put 3-meter high sandbags along north of BKK, BMA negotiation with them and reduced the height. When water was too much we cant manage it all so we focused on protecting the central business district. We are trying to help Pathumthani and Nonthaburi to response to the flood, with boats, equipments, transport and other types of assistance. There is no mediation r negotiation structure there within the organisation, so we are doing it as we go. In the worst case water will stay until December.

Other needs: Evaluate the non-structural DRM approaches: existing planning, resources and tools adequate to respond to the disasters.

Challenges:

- Too many partners working in BKK, irrigation and other departments, too many permission/procedures needed to open water gates
- Difficult to tell if the response is rapid and efficient
- Adequate readiness and awareness to risks – both gov't and communities
- NGO and community response – difficult to manage, and need for better management
- Roles and responsibilities more scattered in the urban areas (BMA, port authority, water drainage bureau under central government city planning dept)

Long-term needs:

- Not yet a long-term recovery plan, dam management, have some plan for dams. As we are currently busy with food distribution, relief efforts, engineering & technical support/inputs/recommendation, equipment for building.
- No insurance plan.
- Infrastructure to prevent potential flooding,
- Economic social aspects also taken into consideration
- Need to emphasize more on self-help in future – reliance



Photo: Waster management is a big problem for BMA/ Credit: Rumana Kabir, UNDP