

INSTITUTIONAL PREPAREDNESS FOR MULTIPLE RISKS IN YANGON, MYANMAR

Zin Mar Than¹, Tin Tin Kyi², Frauke Kraas³

Abstract

Myanmar is among the most vulnerable states with respect to many kinds of natural hazards. Since 2008, when the Tropical Cyclone Nargis had such a disastrous impact, public awareness to natural hazards has been increasing. It was thus not unexpected that in 2009 the Myanmar Action Plan on Disaster Risk Reduction was introduced (last updated in 2017) and in 2013 the Natural Disaster Management Law was passed. In the Action Plan of 2017, 32 priority actions were established and related responsibilities defined for different administrative and spatial levels. Structures were defined for the specific functions and duties, and in particular for the methods and forms of collaboration between the institutions on different levels. But implementation remains weak. Moreover, the goals set for the first phase (until 2020), for instance that disaster management bodies at all levels should then be fully functional, seem somewhat optimistic.

Based on this situation, the joint Myanmar and German research project aims to understand institutional preparedness and awareness for multiple natural risks – in particular cyclone, flood and earthquake risks – in the megacity Yangon. Against the background of risk governance as a key component of successful disaster risk management, the focus is on the following institutional aspects and arrangements: the structural concept of responsibilities, the institutional situation according to disaster preparedness and awareness, and collaborative issues and circumstances related to a disaster.

The research employs qualitative methods to analyse 26 expert interviews (by using the software programme MAXQDA). Institutions in Yangon involved in disaster risk management were asked about their involvement and how they evaluate their preparedness and awareness.

Introduction

Myanmar is threatened by numerous kinds of natural hazards. There are frequent earthquakes of various magnitudes which occur in different regions across Myanmar, mainly in the seismically active areas along the major fault lines. Along the coast and in adjacent regions, tropical cyclones frequently make landfall, bringing heavy rain and causing flash flooding on a wide scale. Particularly disastrous was the Tropical Cyclone Nargis, which on 2-3 May 2008 made landfall in the Ayeyarwady Delta, with wind speeds of more than 210 km/h (category 4 on the Saffir-Simpson Hurricane Wind Scale – SSHS) and local gusts of up to 260 km/h. According to official estimates, the cyclone left around 138,400 people dead or missing; however, as a result of development measures undertaken in the Delta area in the preceding years, numerous new villages had sprung up and a large number of temporary workers were employed, so the number of fatalities may well be as high as 200,000 (Fritz et al. 2009, TCG 2014). With about 2.4 million affected people, it was the third largest catastrophe worldwide since 1980. Other disasters, like Cyclone Komen in 2015, have resulted in increasing awareness of natural hazards among the public. Insofar it was unsurprising that in 2009 the government released a Myanmar Action Plan on Disaster Risk Reduction (RRD 2009) for the first time. This action plan was updated in 2012 (RRD 2012) and again in 2017 (NDMC 2017). Moreover, in 2013 the Natural Disaster

¹ Dr, Institute of Geography, University of Cologne/Germany

² Urban Planning Unit, Yangon City Development Committee

³ Prof. Dr, Institute of Geography, University of Cologne/Germany and Department of Geography, University of Yangon/Myanmar

Management Law was passed (President of the Republic of the Union of Myanmar 2013), and – based on this law – in 2015 the Disaster Management Rules, outlining roles and responsibilities of actors, were formulated (Ministry of Social Welfare, Relief and Resettlement 2015). While the law and rules set a legal and institutional basis for responsibilities in the event of a disaster, the Myanmar Action Plan on Disaster Risk Reduction defines the framework for actions. The last action plan, updated in 2017 (NDMC 2017), identified 32 so-called priority actions, grouped into four pillars: (1) risk information and awareness, (2) risk governance, (3) risk mitigation and preparedness for response, and (4) rehabilitation and reconstruction.

Few action priorities have a specific urban focus. Priority action 3.6 of the plan specifically addresses urban resilience with the objective of improving urban resilience to disaster and climate risks, e.g. by developing disaster risk community plans at the city and ward level, by creating awareness among the population and by strengthening services and infrastructure. The City Development Committee and the governments of selected urban centres are the bodies responsible for this priority action (for Yangon it is the Yangon City Development Committee, YCDC). The report clearly identifies limited capacities and resources as major challenges (NDMC 2017: 49). Some other actions refer to cities, but do not have an exclusive urban focus (unlike priority action 3.6). Thus priority action 1.8, for instance, on the creation of disaster awareness programs suggests prioritizing cities and towns with large populations which are specifically at risk. Priority action 4.9 on heritage conservation addresses urban heritage protection (esp. the Shwedagon Pagoda in Yangon) since many heritage sites are located in cities.

The plan consists of three phases. Phase I (until 2020) focuses on creating and strengthening systems and generating disaster risk information (including the establishment of coordination mechanisms). Phase II (until 2025) will focus on the application of risk information for risk reduction and will start with pilot interventions. Phase III (until 2030) will further institutionalize actions and measures based on phases I and II (NDMC 2017: 16).

The plan has been issued at the national level, however, it envisages the development of resilience at the community level and therefore is flexible in order to adapt to needs on the ground (NDMC 2017: 18). An explicit policy and implementation plan for cities, addressing the urgent need of preparing multiple risk management and linked to the overall city development plan, has not yet been incepted.

Responsibility for the priority actions has been assigned to institutions/agencies at different administrative and spatial levels (from the national down to the ward/village tract level) and other institutions/agencies are named as contributing to the actions. However, there is no detailed description of the specific functions and duties of the institutions with regard to the priority action or, in particular, of the necessary collaboration between institutions on the same and on different levels. Moreover, the goals set for the first phase (until 2020), for instance that disaster management bodies at all levels should be fully functional by that time (NDMC 2017: 21), seem too optimistic.

Against this background, the paper presents initial results of the joint Myanmar German research project “Multiple risks management in extreme events in fast growing (mega)cities in Myanmar”¹. The project aims to (1) investigate awareness, preparedness and management

¹ See more details in the “Acknowledgements” at the end of the paper.

activities in multiple risks situations in big cities in Myanmar and (2) create a basis for setting up a disaster risk management concept that can be used by the government and planning agencies.

Research aim and key research questions

The main aim of the research presented in this paper is to understand the preparedness and awareness of institutions for multiple risks (in particular: cyclone, flood and earthquake risks) in Yangon, in order to establish comprehensive, integrative multiple risk management in the future. The following objectives have been established:

1. To investigate the structural concept of responsibilities of the relevant institutions,
2. To analyse the situation of the institutions with respect to their preparedness and awareness,
3. To examine the level of collaboration between disaster-related institutions.

These objectives have been analysed on the different levels involved in disaster related activities, in particular on the institutional/organizational level, i.e. relevant authorities such as the township administration, fire brigade, Red Cross, etc.. This paper thus considers the institutions and tries to analyse in detail their institutional preparedness, awareness and collaboration. In particular, the following research questions have been raised:

1. Does a structural concept of disaster-related responsibilities according to the institutional dimension and to different spatial levels (city, township, ward, ...) exist in the city of Yangon?
2. What is the state of preparedness and awareness of the institutions involved in disaster risk reduction, and does this enable them to act efficiently in the event of a disaster?
3. How does collaboration with other institutions on the same or on a different level work?

Material and methods

The research employed a qualitative method approach (see for details Bernard 2013, Bryman 2012, Flick 2014). Altogether 26 expert interviews with members of different institutions involved in the disaster issue have been carried out since 2018 (the average length of interview ranges from 30 min to more than an hour). The interviews were recorded, transcribed (and translated into English), and entered into the software programme MAXQDA. After that, the data was coded and analysed. Simultaneously, all interviews received a unique code number. Direct or indirect quotes and information from the interviews are cited in the text via this code system (e.g. YGN-Risk-048).

Besides the expert interviews as basic information sources, some information on specific aspects was gathered from secondary data collected through literature reviews and from statistical sources.

A structural concept of responsibilities of institutions

Central for disaster risk management in Myanmar are the Disaster Management Committees, which were legally introduced in 2013 by the Natural Disaster Management Law (President of the Republic of the Union of Myanmar 2013). The committees were established on different administrative levels, i.e. national, state/regional, district and township. Their duties and

responsibilities are described in detail in the Natural Disaster Management Law and in the Disaster Management Rules (Ministry of Social Welfare, Relief and Resettlement 2015). According to an expert (YGN-Risk-053), the composition of the National Disaster Management Committee (NDMC) at present functions as follows. The vice president II has become Chair of the NDMC. The Minister of Social Welfare, Relief and Resettlement and the Minister of Home Affairs are deputy heads/chairs of the NDMC. Representatives of all other relevant ministries, all prime ministers of regions/states and the generals from the navy, air-force and army are also members. All important parties related to national level disaster risk reduction are thus represented and active on the committee. On the subsequent levels, the leadership structure is as follows. On the levels of the state/regions, the prime minister is the head/chair of the committee, the secretary is the head of the General Administrative Department (GAD) and the joint secretary is the director of the Department of Disaster Management (DDM). For the district level, the head of the district administrative department is the chair of the committee. Similarly, on the township level, the head of the township administrative department leads the committee.

In the event of a disaster, the different levels should put measures into practice according to the principle of subsidiarity, that is, a disaster will be dealt with by the lowest level which is able to handle it. In detail, the process is described in the Disaster Management Rules from 2015 (Ministry of Social Welfare, Relief and Resettlement 2015), in particular in Chapter 8. An expert explained the functioning of the subsidiarity approach in the following way (YGN-Risk-053). If a disaster occurs the township disaster management committee ascertains the impact and reports to the district disaster management committee. If the case cannot be handled on the township level, the district level committee gives support. This proceeds up to the national and thus final level.

Based on this concept, each township has to form a Township Disaster Management Committee (see for instance Tab. 4.1). The number of members involved can differ from township to township and depends on the number of institutions located in the township (YGN-Risk-066).

Table 4.1 Township Disaster Management Committee – the example of Shwe Pyi Thar Township

Township Administration	Head
Township Police Force	member
Township Development Committee	member
Township Customs Office	member
Township Agriculture Office	member
Township Planning and Finance Office	member
Township Transportation and Telecommunication Office	member
Township Health Department	member
Township Social Welfare, Relief and Resettlement	member
Township Law Office	member
Township Electricity Office	member
Township Road and Building Department (YCDC)	member
Township News and Media Office	member
Township Education Department	member
Township Labour and Immigration Office	member
Township Fire Service Department	member

Data source: YGN-Risk-066 and GAD (2019)

Each institution has its own tasks (see Tab. 4.2). The table shows the institutions that are actively involved in disaster management. In the table, some institutions such as the Department of Meteorology and Hydrology, the Department of Construction and the Department of Education have tasks that are more related to preparedness for disasters. However, the responsibility of other institutions, in particular the Fire Service Department, Police Force, and National Planning and Economic Department, are more associated with activities during and after a disaster. Of course, there are also institutions, namely the Department of Disaster Management, Yangon City Development Committee (YCDC), and the General Administrative Department, which have duties in all three phases: before, during and after a disaster.

Table 4.2 Institutions related to disaster management

Institution	Responsibility
Department of Meteorology and Hydrology	active role in early warning dissemination
Fire Service Department	search and rescue
Police Force	security/control the whole disaster area
Department of Disaster Management	provide relief, conduct educational trainings and manage the disaster management fund
Department of Health	provide emergency health service
News and Information	report on the emergency situation and provide press releases on disaster risk reduction (radio, TV and newspapers)
Myanmar Red Cross Society	first aid, search and rescue, provide non-food items
Yangon City Development Committee (YCDC)	build urban resilience to address disaster and climate risks, cleaning, damages operation, drinking water supply, toilets...
Transportation and Communication	responsible for transporting food, relief items and rehabilitation materials
Department of Electricity	electric operation
National Planning and Economic Department	initial needs assessment, damage and loss verification and needs identification
Department of Construction	construction, maintenance and upgrading of the roads and bridges
Department of Education	comprehensive school safety programme
Department of Agriculture and Irrigation, Livestock	strength of dams and irrigation facilities, renovation, livelihood
Department of Forestry	promote environmental protection and prevent environmental degradation
General Administrative Department	overall management

Data source: expert interviews (2018-2019) and presentation by U San Kung (DDM) at a workshop on 26.02.18

Other institutions directly or indirectly work on disaster management issues. For instance, the Water Transport and Communication Department works on erosion in the Yangon Region (out of the municipal area); it is a member of the Region Disaster Management Committee (YGN-Risk-049). Similarly, the Myanmar Port Authority always provides tidal information and works on the sedimentation of the riverbed; this is relevant to the cause of flooding (YGN-Risk-059).

Concerning the responsibilities of the institutions, critical comments were raised, such as: *“all the townships received the nationwide plan, but the plan is not practically implemented and*

every month the responsible person just reports that it is done according to plan. In reality, no monitoring and no collaboration between the institutions takes place” (YGN-Risk-048) and “some institutions are appointed and the responsibilities are allocated, but they are not actively involved” (YGN-Risk-046).

Even though each institution has its own tasks, staff and resources, some constraints were pointed out. The problem of financing is almost general. The Department of Disaster Management, which manages the disaster management fund, does not have sufficient funds. Some tasks (e.g. small scale) can be financed by the budget of the ministry, others cannot. Thus each institution needs donors (e.g. UN agencies or NGOs) to fulfil its responsibilities (YGN-Risk-053). As an expert (YGN-Risk-046) pointed out, as a result activities regarding mitigation and preparedness are very few, similarly recovery and reconstruction activities are not implemented to the extent planned. However, a lot of activities related to emergency response can be found. This was proven by the latest disaster experiences. Some experts (YGN-Risk-050, 058) confirmed that due to Myanmar tradition and customs, a high number of donations are given by the private sector and civil society, and many volunteers act generously and altruistically in the event of disasters.

Another barrier to the fulfilment of the responsibilities of an institution is related to the historical structures of centralization and the superimposition of daily work. These attitudes and behaviour seem to have changed in recent years, but still often remain in people’s minds. The implementation of activities and responsibilities (e.g. committees) on the grassroots level and township level is still weak (YGN-Risk-047).

Institutional Preparedness and Awareness

Activities intended to improve preparedness are often not fully realized due to costs, even though it is known that preparedness can reduce damage in the event of disaster. One expert (YGN-Risk-046) explained his experience in a flood case: when his institution supported relief in the flooded area, he was asked by the victims why the institution had not acted properly by applying preparation or prevention measures instead. The expert came to the conclusion: *“It is true, we do not take action for proper preparedness.”*

For instance, the main causes for floods in Yangon are blockages in the drainage system and the increased riverbed level of Yangon River due to sedimentation (YGN-Risk-049). The blockages are mainly caused by waste disposal; this is particularly true in Hlaing Thayar and Dagon Seik Kan, South Dagon and North Okkalapa Townships (YGN-Risk-048, 049). Even though recent efforts to reduce the waste impacts have eased the situation (YGN-Risk-056, 049), there are still some areas in Hlaing Thayar, South Dagon and Dagon Seikkan Townships which are flooded for several days after heavy rain events (YGN-Risk-048, 049) because the waste disposal problem has not been eliminated.

In the downtown area, in particular in Botahtaung Township, Yangon River's bed level has increased with usual tide events, leading to reinforced tidal floods. Yangon/Myanmar Port Authority is aware of the situation and tries to take care of this issue every year, but the measures to reduce the bed level are costly and thus flooding continues, as the expert from the Department of Water Transport and Communication explained (YGN-Risk-049).

The same expert pointed out one further acute reason for flooding: road renovation has caused increases in the height of the streets (e.g. at Parami Road). This leads to blocked water run-off, standing water on the roads and increased risk of flooding for the houses. Such side effects were not taken into consideration earlier.

The experts on earthquake-related topics emphasized that, as early warning is impossible, measures of preparedness and mitigation are very important (YGN-Risk-047). Thanks to collaboration between the earthquake committee and the Myanmar Engineering Society in recent years a hazard map has been developed to visualize the earthquake-prone zones of Myanmar and the likely intensity of seismic events. Based on these maps, engineers can to a certain extent assess potential risks. For instance, they collected soil data (e.g. soil types and their distribution) and wind data. Based on these factors, building resistance requirements for new constructions can be calculated. These maps should also be used for monitoring the resistance of existing buildings.

A further step towards preventing earthquake damage was the establishment of the Myanmar Building Code in 2012. An expert (YGN-Risk-047) raised some doubts about whether the code is always applied or not. According to his experience, the architects follow the code because the plans are checked by YCDC. But he raised concerns about whether the construction itself is always really carried out according to the plans.

The experts are very aware that information and (early) warnings are very important for people's awareness and preparedness. But at the same time the experts (YGN-Risk-049, YGN-Risk-058) doubt the reliability of media in disseminating this information.

An expert from the Department of Meteorology and Hydrology described the dilemma in the following way: *"Nowadays people can watch satellite pictures. They can see the clouds and can to a certain extent forecast the weather. That is why I always advise people just to listen to our news. But even if you see the clouds, you cannot correctly interpret the weather, there are still some more factors you have to consider. [...] To generate a cyclone a lot of factors need to combine, the wind direction, humidity, and so on. As you know, there are a lot of rumours regarding the weather in our country which are spread by social media, in particular Facebook"* (YGN-Risk-051).

Other experts (e.g. YGN-Risk-047) agreed with the above concerns and explained that a reliable and qualified warning system for disaster risk reduction (in particular for floods and cyclones) is needed. After Cyclone Nargis, a warning application (Disaster Alert Notification (DAN)/android application) was introduced by the Department of Disaster Management (DDM), which posts news of cyclones and floods, but the experts doubted that it is well known to the public.

Hydro-meteorological disasters, in particular cyclones and river floods (as the water comes from upstream), can be foreseen, and even flash floods can nowadays be forecasted to some extent. People should be aware of this and be prepared (YGN-Risk-051). The Department of Meteorology and Hydrology/Yangon is the only one that issues disaster news for the whole country and also gives early warnings to relevant institutions (about 40, including the Department of Disaster Management (DDM), the General Administrative Department (GAD), city development committees, the police and fire brigades and the media) every hour (YGN-Risk-051). However, the same expert also mentioned weaknesses of the forecasts caused by

inadequate data and a lack of appropriate equipment: *“There are models, but we do not have a super computer and we do not run it. But in Thailand there is the Regional Integrated Multi Hazard Early Warning Centre. We get the data for Myanmar from this centre and from another regional centre in India. Norway also supports us. We give our data to Norway and Norway runs this data and we download it. But the resolution is not good enough. The time is different. Currently our forecast is getting better, but it is not a satisfactory situation”* (YGN-Risk-051). Thus the same expert called for a procedure that does not depend totally on calculated models but integrates simple traditional measures, for instance the analysis of observed clouds, *“according to our traditional way”* (YGN-Risk-051).

Consequently, the same expert saw a strong need for well-educated, qualified staff who can fulfil their tasks properly. Often a bachelor degree is not sufficient. According to the expert’s experience people with this education level are not qualified enough to understand and judge a weather situation. Obviously the great motivation of the staff compensates for deficits: *“Our work is our hobby”* (YGN-Risk-051). This indicates that regular staff upgrading and qualification measures could substantially enhance the existing knowledge and experience.

A lack of equipment is a further problem. This includes the lack of a dressing room and suitable uniforms for fire fighters, which means that reaction times are unnecessarily prolonged compared to the situation in other countries (YGN-Risk-058). It also includes much more complex problems related to the lack of data and equipment and the above mentioned dependency on weather forecasts from other countries.

Most of the experts (YGN-Risk-046, 047, 048, 049, 051) also underlined that there are insufficient or weak public awareness trainings in Yangon, and that it is very difficult to organize the public to attend such trainings. One of the experts stated that the public has already gained a certain awareness level but not systematically. This means people cannot respond systematically. Actually, disaster awareness should be integrated into people’s daily lives. Frequent training of the public is required rather than acute training.

It is important that awareness reaches the minds of the local people. According to one expert (YGN-Risk-047), probably the most efficient way to successfully raise awareness would be to start with school children as they can then share their knowledge with their parents. The experts point out that such suggestions are also made in awareness-related literature (e.g. Johnson et al. 2014, Shikada et al. 2012). For instance, Shikada et al. (2012) reported on awareness building activities in the Ayeyarwady Delta after Nargis and emphasized that incorporating disaster topics into school teaching is an entry point for knowledge dissemination to the larger community because the students act as multipliers to a wider audience.

An urgent need which is often mentioned is the development of maps of buildings and the establishment of a system of meeting/evacuation points. Currently, most of the institutions interviewed do not have proper building maps or emergency escape routes. Therefore experts (e.g. YGN-Risk-046, 047) suggest that such building maps should be developed and people should receive training on how to escape and how to reach the meeting points. Moreover, training should be carried out under real conditions in daily life activities. One expert (YGN-Risk-046) emphasized the urgent need to define meeting points in schools and to ensure that everybody is trained to reach his or her meeting place. Students should know where they have to go in disasters, parents should know where they can collect their children, and, similarly, children should know where they can meet their parents. The same holds true for public meeting points in

the townships and wards. Such knowledge and behaviour would reduce unnecessary burdens in disaster situations, e.g. dealing with cases of missing people.

Furthermore, the issue of shelter in the event of a disaster was addressed (YGN-Risk-053). According to this interviewee, every township should define open spaces (e.g. playgrounds, parks) for shelters. According to current practice, monasteries and schools are used as potential shelters, but it is questionable whether the buildings are strong enough to withstand an earthquake disaster. Thus, open spaces are preferred as shelters.

Evaluation of the collaboration of institutions

“In Myanmar the most difficult thing is collaboration between the institutions. In the event of a disaster the most difficult issue is that there is still a lack of proper links between the higher level and lower levels” (YGN-Risk-053). This expert from the Department of Disaster Management points to the essential issue of risk governance. Later in the interview, examples of non-collaboration were mentioned, caused by ignorance of the existing laws and regulations and counterproductive activities by international relief agencies. According to the interview, customs was still expected to fill out the normal tax-free papers when international help arrived. This took time and was a waste of capacity. According to the Disaster Management Law and the Myanmar Action Plan, it is unnecessary to carry out such a procedure in its full length, and the customs authorities should reduce the procedure. While the upper levels of the administration are qualified and aware of the change of rules in the event of a disaster, the middle and lower levels of the customs authorities have not yet been advised of or trained to change the procedure accordingly. Similarly, relief equipment should be instantly withdrawn from the customs’ warehouses and allocated to the affected areas. To date this has not been possible.

Moreover, concerns about unskilful data collection were raised, which is caused by a lack of efficient collaboration during disasters. For instance, in a disaster in Shwe Pyi Thar Township, the township disaster management committee could not provide accurate data, therefore the victims complained either that they did not receive relief care or that it took too long to deliver it. Sometimes data collection is not performed by the responsible departmental units, but instead by other institutions. For instance, during a recent disaster, as the data was urgently needed, data collection was taken over by YCDC staff and the township administrative staff although it should have been the main task of the Planning Department (Ministry of Finance). Basic data should also be available at the lowest level, i.e. the township administrative department. In the event of a disaster, up-to-date data should be collected in collaboration with the Planning Department.

Information is often misunderstood, which leads to the wrong reactions, as the case of a weather forecast shows (YGN-Risk-051). The usual procedure is as follows. The Department of Meteorology and Hydrology/Yangon issues an early warning to the relevant institutions. Then, the Department of Disaster Management (DDM) and the General Administrative Department (GAD) disseminates the information stepwise to further institutions and the public. On the way “down the hierarchies” misunderstandings may arise. For instance, after information about a cyclone passing the Southern Chinese Ocean was given, one ward actually initiated a cyclone alarm. Since this instance, the Department of Meteorology and Hydrology has conducted a so-called disaster forum twice a year, before and after every monsoon season, where the relevant institutions hear about proper procedures of information dissemination and warning chains. During the forum workshop, terms and terminology are explained and discussed.

In the interviews, some experts pointed out circumstances that impede effective collaboration. The traditional and inherent system of frequent transfer and promotion hampers the building of continuous initiatives and information flow. For instance, in Hlaing Thayar Township regular capacity building workshops for disaster risk reduction were organized for schools and the local communities with the help of the township officer and educational staff (YGN-Risk-048). The project went well until the township officer was transferred. Even though the project was properly handed over, the program has since not worked as smoothly as before. The expert concluded: *“It depends on the person and their interest in accomplishing the collaboration”* (YGN-Risk-048).

The frequent changes of the institutional members who participate in meetings cause similar difficulties. An expert (YGN-Risk-046) described the typical situation that one representative attended the first meeting, but could not join the second and third meetings. Such constant changes in representatives result in inefficient institutional knowledge and interaction, as information is not forwarded properly, expertise is not systematically built and personal trust as the basis for efficient collaboration does not emerge. New participants often lack knowledge about previous meetings.

Additionally, financial matters hamper successful collaboration (YGN-Risk-046). If people from other institutions join in with, for instance, data collection fieldwork, these institutions have to pay the costs for their staff. The expert is convinced that this is a reason for the lack of involvement of other institutions, as in the long run some institutions cannot afford these costs.

A severe weakness, further, lies in the centralized system, which is deeply rooted in Myanmar. Some experts (YGN-Risk-047, 048, 053) complained that essential decisions are often delayed because of long, time-consuming official procedures and limited staff in decision-making positions. This produces barriers to effective collaboration in different ways. For instance, the township officers have a high workload and have to fulfil multiple tasks. Although most of the township officers are very devoted and active, sometimes they are overloaded with functions (YGN-Risk-047). Finding alternative or additional assistance, for instance from another representative, is often difficult due to the personal responsibility system and frequent lack of capacity of possible substitutes. Additionally, understanding of activities and reporting is insufficient so this kind of responsibility allocation rarely happens.

On the other hand, looking for alternatives is also not always a successful strategy, as the statement of another expert (YGN-Risk-053) made clear when describing a meeting of a district disaster management committee. The heads of the township administrative departments were invited but not all of them attended, and in those cases only the deputy staff officers participated. The fact that these deputies are not in decision-making positions and are not well-trained in the field meant that the meeting could not achieve the expected results. Obstacles like these lead to time-consuming and inefficient collaboration activities.

The situation is even more problematic because administration staff still often display “old centralized thinking” as the following example demonstrates:

“The township officer mentioned that he needs the letter of permission from the ministry, even for a small issue. He is still confused that he is nowadays allowed to improve the situation in the ward. Because he was used to it being centralized for a long time” (YGN-Risk-048).

It was also emphasized that many decision-makers from upper levels try to train the staff, but the staff often only want to complete their work, sometimes with limited effort. The expert concluded: *“Only very few staff can work properly”* (YGN-Risk-048).

Weaknesses are also related to information and invitation procedures for meetings, drill sessions and training programmes (YGN-Risk-048). Invitations often arrive with too little notice, often just a day ahead. This is particularly difficult for volunteers in the townships who may then just receive a phone call asking them to attend an activity; at short notice this is then not always possible due to existing obligations. With respect to meetings of, for instance, the Disaster Risk Reduction working group, often only the director of an institution receives the invitation. If this person is not able to attend personally, often the information is not forwarded to another representative of the institution which then means that often no representative of the institution can attend. Clearly it is necessary to discuss how and to whom invitations can be disseminated and to change the invitation procedure.

The above examples illustrate major constraints in risk governance. Weaknesses in organization and collaboration are apparent, making effective disaster management difficult.

On the other hand, a number of examples of good practice and good collaboration exist which illustrate the important potential for improvement in disaster risk reduction. An expert from the Fire Brigade talked of his experience which is such a case of best practice. He explained about collaboration between fire fighters and the police. In the event of a fire disaster, the traffic police are immediately informed by the fire department. The police stop the traffic on both lanes of the road so that the fire fighters can quickly arrive at the fire (YGN-Risk-058). Positive examples are also reported about collaboration between the Department of Disaster Management (DDM) and the fire brigades. Both departments were previously in the same ministry but nowadays are under different ministries. Based on the previous collaboration, DDM still supports the needs of the fire departments. For instance, during the recent flood in Kayin and Mon States DDM provided boats for the fire department in the rescue phase as well as food and clothing that could be handed over to the victims.

An expert explained how important good collaboration between the institutions is in the event of disaster and how collaboration has to be organized: *“If there is an earthquake, the first response should be to power off electricity as soon as possible, because fires can start in collapsing buildings. Then, we need strong collaboration between transport, security and administration. Our fire brigade will concentrate on search and rescue and the police take care of security. Supply of food, water and other necessities will be undertaken by the administrative department and DDM”* (YGN-Risk-058).

Discussion

After Cyclone Nargis in 2008, Myanmar started to establish a conceptual and organizational base to improve the way in which the challenges of disasters are met. The disaster management committees on the different administrative levels are a decisive instrument here. Furthermore, the experts point out that the bottom up/subsidiarity approach is most essential in a disaster situation, because prevention measures have to be prepared and damage has to be mitigated first on the local level. However, the experts are quite sceptical about whether the local approach currently works satisfactorily. There is evidence that the township disaster management

committees – although they exist – do not always function properly. Sometimes, it seems, they exist “only on paper”. In addition, “traditional old thinking” from the times of centralization is mentioned as an important hinderance. The transformation from one political system to another is thus clearly reflected in risk governance as well.

Furthermore, there is a lack of sufficient awareness and, even more importantly, there seems to be a gap between awareness and the performance of preparedness activities. The “old thinking” mentioned above is combined with a lack of self-organized initiative. High costs and financial shortcomings in the relevant institutions also decisively limit many improvements for disaster prevention.

As different natural disasters have very different consequences and the effects of disasters can vary tremendously, manifold know-how is needed. This ranges from security matters via engineering issues to questions of search and rescue and medical treatment. Comprehensive concepts of disaster preparedness and disaster management are thus required. Institutions with their specialized knowledge and activities have to collaborate more intensively before, during and after a disaster. Therefore, a locally adapted efficient mode of risk governance needs to be developed. This requires the collaboration of different administrative levels and different spatial levels as well. As all experts agreed that good collaboration is essential for successful management and some good practice examples were reported, there is no doubt that there is a great will to collaborate in the institutions in Yangon.

The findings revealed a number of weaknesses though, which lead to the reduced effectiveness of collaboration and impede good disaster preparedness. Insufficient finances and an “old centralized thinking and work attitude” is rooted in the current transformation process Myanmar is undergoing. The professionalization and standardization of risk-related concepts, institutional collaboration and labour division, information dissemination and advanced responsibility are urgently needed. Clear political willingness and ambition can lead to improved planning, organization and management. More difficult to achieve is one important factor that was repeatedly cited as an essential prerequisite for good collaboration: trust between the individuals and institutions involved and personal continuity, which is hampered by the existing system of transfer and promotion in Myanmar.

Concluding remarks

Compared with the situation of about ten years ago (i.e. before Cyclone Nargis), disaster risk reduction awareness and procedures have improved and a solid base for more adequate disaster management has been established. However, the results of the research project with respect to institutional preparedness reveal weaknesses that need to be tackled for the future:

- People should be nominated for the disaster management committees on the different administrative levels who have the required experience and are well-trained in making quick and reliable decisions. These members should receive comprehensive training on how to collaborate efficiently, in particular in disaster situations.
- Information and awareness programmes for the staff of the disaster-related institutions need to be conceptualized and realized in order to raise disaster awareness and knowledge in general and to enable all members of the institutions to consider disaster risk reduction in their daily work and life routines. Such programmes, furthermore, should also be

developed for the private sector and civil society. Schools, colleges and universities should be included as effective institutions for the dissemination of knowledge and awareness.

- Maps of public buildings need to be developed and escape routes should be established. Workshops and trainings (including compulsory drills) should be set up for all staff members on a regular, frequent and compulsory basis.
- Evacuation sites should be systematically defined for all institutions, the private sector and local communities, and a comprehensive concept of disaster risk reduction should be developed. This should include concrete measures, for instance, shelter management training (i.e. how to connect the shelters and how to supply victims during the disaster and its aftermath).

Acknowledgement

This research paper was possible because of the generous cooperation of experts from relevant institutions, for instance, the township administrations, the Fire Service Department, the Department of Disaster Management, the Meteorology and Hydrology Department and the Myanmar Red Cross Society. Very substantial support was provided by the Yangon City Development Committee (YCDC) team, in particular Saw Sandar Oo (Deputy Director), Thu Htet Tun (Staff Officer) and Win Lei Mar (Engineer) from the City Planning and Land Administration Department.

The paper emerged from the joint Myanmar German research project “Multiple risks management in extreme events in fast growing (mega)cities in Myanmar”, jointly conducted by the Institute of Geography (University of Cologne/Germany), the Yangon City Development Committee (YCDC), the Myanmar Environment Institute (MEI), the Myanmar German Research Centre for Urban and Regional Development, the Ministry of Construction, and the Department of Geography and the Center of Excellence (CoE) for Urban and Regional Development at the University of Yangon. The authors sincerely thank the German Federal Ministry of Education and Research (BMBF) for the support of the research project (No. 01LE1904A) within the funding line of sustainable development of urban regions joint projects (NUR).

References

- Bernard. H.R. (2013): *Social Research Methods: Qualitative and Quantitative Approaches*. Los Angeles: Sage Publications, 2nd edition.
- Bryman, A. (2012): *Social Research Methods*. New York: Oxford University Press.
- Flick, U. (2014): *An Introduction to Qualitative Research*. London: Sage Publications, 5th edition.
- Fritz, H.M., Blount, C.D., Swe Thwin, Moe Kyaw Thu, Nyein Chan (2009): *Cyclone Nargis storm surge in Myanmar*. *Nature Geoscience* Vol. 2, No. 7, pp. 448-449.
- GAD (General Administration Department) (2019): *General Administrative Data Shwe Pyi Thar Township, Yangon Region*. Yangon.
- Johnson, V.A., Ronan, K.R., Johnston, D.M., R. Peace (2014): Evaluations of disaster education programs for children: A methodological review. *International Journal of Disaster Risk Reduction*, 9, pp. 107-123.
- Ministry of Social Welfare, Relief and Resettlement (2015): *Disaster Management Rules. Notification No. 22/2014. The 4th Waning Day of Tagu, 1376, M.E. (7th April, 2015)*. ([https://www.ifrc.org/Global/Publications/IDRL/IDRL%20guidelines%20implementing%20legislation/English%20version%20of%20%20DM%20Rules%20\(approved\).pdf](https://www.ifrc.org/Global/Publications/IDRL/IDRL%20guidelines%20implementing%20legislation/English%20version%20of%20%20DM%20Rules%20(approved).pdf)). (21.01.2018).
- NDMC (National Disaster Management Committee, Republic of Myanmar) (2017): *Myanmar Action Plan on Disaster Risk Reduction (MAPDDR) 2017*. Nay Pyi Taw. (https://themimu.info/sites/themimu.info/files/documents/Core_Doc_Myanmar_Action_Plan_on_Disaster_Risk_Reduction_2017.PDF). (accessed on 21 January 2018).
- President of the Republic of the Union of Myanmar (2013): *Natural Disaster Management Law (The Pyidaungsu Hluttaw Law No. 21, 2013). The 9th waning of Waso, 1375, M.E. (31st July, 2013)*. (http://www.myanmar-law-library.org/IMG/pdf/2013-07-31-natural_disaster_management_law-en.pdf). (accessed on 22 June 2019)
- RRD (Relief and Resettlement Department, Ministry of Social Welfare, Relief and Resettlement) (2009): *Myanmar Action Plan on Disaster Risk Reduction (MAPDRR) 2009-2015*. (https://reliefweb.int/sites/reliefweb.int/files/resources/Myanmar_Action_Plan_on_Disaster_Risk_Reduction_2009-2015_EN.pdf). (accessed on 24 June 2019).
- RRD (Relief and Resettlement Department, Ministry of Social Welfare, Relief and Resettlement) (2012): *Myanmar Action Plan on Disaster Risk Reduction (MAPDRR) 12*. (https://reliefweb.int/sites/reliefweb.int/files/resources/RDD_FILE_1340609699_MAPDRR_English_June%202012.pdf). (accessed on 21 January 2018).
- Shikada, M., Than Myint, Ko Ko Gyi, Nakagawa, Y., S. Shaw (2012): Chapter 10 Reaching the unreachable: Myanmar experiences of community-based disaster risk reduction. In: Shaw, R. (ed.): *Community-Based Disaster Risk Reduction* (Community, Environment and Disaster Risk Management, Volume 10). Bingley: Emerald Group Publishing Limited, pp.185-203.
- TCG (Tripartite Core Group: Government of the Union of Myanmar, Association of Southeast Asian Nations, United Nations) (2014): *Post Nargis Joint Assessment (PONJA)*. (<https://www.humanitarianlibrary.org/resource/post-nargis-joint-assessment-0>). (accessed on 10 October 2019).